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UDC: 575.153:633.11

STRUCTURE OF CHLOROPLASTS IN ANTHERS OF ALLOPLASMIC WHEAT LINES WITH
VARYING POLLEN FERTILITY

Kiev TSITOLOGIYA I GENETIKA in Russian Vol 18, No 4, Jul-Aug 84
(manuscript received 6 Apr 83) pp 243-247

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of Sciences, Minsk

[Abstract] A comparative description is presented of changes in the ultra-structure of chloroplasts in the presence of fertile and pollen sterilizing cytoplasms. Chloroplasts were studied of anthers of alloplasmic wheat lines with the nuclear genome *Triticum aestivum* (Chinese Spring variety) and *T. dicoccum*, *T. dicoccoides*, *T. speltoides* (fertile lines), *Ae. crassa*, *Ae. juvenalis* (partial sterility). The chloroplasts of alloplasmic line anthers of wheat are a good model for the study of interaction of the nuclear genome and cytoplasm in the formation of the chloroplast ultrastructure. The clearest changes in chloroplast ultrastructure of anthers appear in alloplasmic lines having fully and partially sterilizing cytoplasms. The genetic structure of the nuclear genome of alloplasmic lines changes the effect of the cytoplasm at the level of the ultrastructure of the anther chloroplast. Figures 4; references 5: 2 Russian, 3 Western.
[852-6508]

UDC: 633.16:631.524.84

HEREDITY OF CERTAIN CHARACTERISTICS AMONG RECIPROCAL SPRING BARLEY F_1
HYBRIDS IN RIGHT BANK UKRAINIAN FORESTED STEPPE

Kiev TSITOLOGIYA I GENETIKA in Russian Vol 18, No 3, May-Jun 84
(manuscript received 26 Sep 82) pp 190-196

BONDAR', F. G. (deceased) and AVRAMCHUK, N. G., Vinnitsa Agricultural
Experimental Station

[Abstract] 28 pairs of reciprocal hybrids produced from crossed varieties of local and lodging-resistant spring barley were studied. The inclusion in

the crossing system of varieties differing in a number of characteristics of productivity, morphologic characteristics and food value properties allows analysis of heredity of the hybrids. The studies establish reliable differences in the nature of heredity, productivity indices, content of protein and lysine in the grain, certain morphologic characteristics and properties characterizing lodging resistance. The selection of components for crossing should be formed with inclusion in the mother variety of a highly productive form, as well as a variety with high protein and lysine content. Figure 1; references 8 (Russian).
[853-6508]

UDC: 633.11"324":631.524

PROTEIN CONTENT, ITS HEREDITY AND RELATIONSHIP WITH CERTAIN CHARACTERISTICS IN EARLY GENERATION WINTER WHEAT HYBRIDS

Kiev TSITOLOGIYA I GENETIKA in Russian Vol 18, No 3, May-Jun 84
(manuscript received 21 Jan 83) pp 200-205

KIRICHENKO, F. G., LITVINENKO, N. A. and ADAMOVSKAYA, V. G., All-Union Selection-Genetic Institute, Odessa

[Abstract] The purpose of this work was to study the nature of the heredity of protein content in interspecific hybridization of various sources of this property with correspondingly selected regionalized varieties. The studies were performed in 1976-1977 with hybrids F_1 and F_2 . The hybrids were obtained by crossing foreign varieties in a three year study of the characteristic of increased protein content in the grain: Atlas-66, Apache, Iohardi, Vermilion, Perdue 5119-10-20-A, Forte, Dunav NS-60, ICA-578BB, Cyaneshtor, 370/73, 416/57 with highly productive high quality regionalized and promising varieties: Odessa 51, Bezostoy 1, Priboyem, Yuzhankoy, and Volnoy. The protein content in F_1 hybrids obtained by crossing of domestic selection varieties with various sources of elevated protein content was inherited primarily by intermediation or by worst parent type. The nature of splitting of hybrids F_2 with respect to protein content depends on genetic specifics of the varieties crossed. The best genetic sources of the characteristic with interspecific hybridization are Atlas 66, Dunav NS-60 and Iohardi. Figure 1; references 14 (Russian).
[853-6508]

UDC: 575.153

DEVIATIONS IN SPLITTING BASED ON MALE-STERILITY-TRAIT CHARACTERISTIC EVOKED
BY INFLUENCE OF CYTOPLASM

Kiev TSITOLOGIYA I GENETIKA in Russian Vol 18, No 3, May-Jun 84
(manuscript received 24 Jan 83) pp 218-222

DAVYDENKO, O. G., Institute of Genetics and Cytology, Belorussian SSR Academy
of Sciences, Minsk

[Abstract] A study was made of the interaction with nuclear genes and foreign cytoplasm in certain species of *Aegilops* and *Triticum*. The sources of foreign cytoplasm were alopasmatic lines of wheat with Chinese spring genome and cytoplasm of the following species: *Aegilops squarrosa* (C04), *Ae. comosa* (C05), *Ae. speltoides* (C08), *Ae. sharonensis* (C10), *Triticum dicoccoides* spont. (C21), *T. dicoccum* (C22), *Ae. cylindrica* (C28), *Ae. ventricosa* (C36), *Ae. variabilis* (C34), *Ae. juvenatis* (C53), *Ae. crassa* (C55), *Ae. vavilovii* (C56) and the euplasmatic line with cytoplasm *T. aestivum* (C52). In all cases identification of sterile plants were performed during blossoming based on a variety of characteristics. None of the cytoplasms analyzed in the present work are F-cytoplasm for male sterility genomes. Deviations observed in separation can be explained by the influence of the foreign cytoplasm on selectivity of fertilization and frequency of recombinations. References 5: 2 Russian, 3 Western.
[853-6508]

UDC: 632.35

STUDY OF BACTERIAL DISEASES OF CEREALS AT MOSCOW UNIVERISTY

Moscow BIOLOGICHESKIY NAUKI in Russian No 5, May 84
(manuscript received 18 Mar 83) pp 20-25

CHUMAYEVSKAYA, M. A.

[Abstract] This article reviews studies over the past 3 decades on stem rot in sorghum and maize, bacterial spotting of sorghum and Sudan millet as well as haloblight of oats. Results reported at various conferences since 1960 are restated. Empty ear in wheat and barley is also reported to be a bacterial disease. Possible pathogens are noted for each of these diseases. (Report recommended by Chair of Lower Plants, Moscow State University).
References 34: 32 Russian, 2 Western.
[877-6508]

AGGRESSIVENESS CHARACTERISTICS OF RACES MAKING UP NORTHERN CAUCASUS POPULATION OF PUCCINIA RECONDITA ROB. EX DESM.

Moscow BIOLOGICHESKIY NAUKI in Russian No 5, May 84
(manuscript received 19 Apr 83) pp 90-94

ALEKSEYEVA, T. P. and SMIRNOVA, L. A.

[Abstract] Indices are presented describing the aggressiveness of races composing the northern Caucasus population of the pathogen of brown wheat rust. Comparison of the infectious virulence of the spores indicated that the most resistant phase is shooting. The resistance of plants in the budding phase is variable. Race 77 is highly infectious during sprouting, bushing and ear formation. The infectiousness of races 15b, 88, 122, 21 and 7 for mature plants is less than for sprouts. Infectious coefficients of spores for races 5, 15a, 25, 35, 54 and 130 are similar but less than that of race 77. The information on aggressiveness of races composing the northern Caucasus population of *P. recondita* has been used to find the parameters necessary to construct a mathematical model for race prediction. References 3: 2 Russian, 1 Western.
[877-6508]

PRODUCTION OF DIPLOID WHEAT-RYE HYBRIDS

Moscow GENETIKA in Russian Vol 20, No 8, Aug 84
(manuscript received 24 May 83) pp 1344-1348

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[Abstract] *Triticum monococcum* L. and *Secale cereale* L. were crossed using a set of specimens at the author's institute from East and West Germany, Spain, Turkey, Italy, Yugoslavia, Albania, Rumania and Japan. The hybrids grown in 1981 were intermediate between the two initial forms, somewhat larger than the rye. They had down beneath the spikes, long stalk (up to 125 cm) and were quite bushy. Stalks with sterile spikes were periodically cut off the hybrids during the vegetation season, which helped the development of new shoots. The dividing cells at the tips of hybrid roots grown in vitro had significant myxoploidy, the number of chromosomes varying from 8 to 28 with a modal number of 14. Fourteen chromosomes were counted in metaphase I of meiosis. The article thus demonstrates the possibility of producing inter-genus hybrids of these plants by embryo culture. References 12: 1 Russian, 11 Western.
[1618-6508]

UDC 577.15:576.858

PREPARATIVE ISOLATION OF AVIAN MYELOBLASTOSIS VIRUS REVERSE TRANSCRIPTASE

Kiev UKRAINSKIY BIOKHMICHESKIY ZHURNAL in Russian Vol 56, No 5, Sep-Oct 84
(manuscript received 23 Jan 84) pp 503-514

STAVERSKAYA, O. V., DOBROVOL'SKAYA, G. N., KAVSAN, V. M.,
ISHCHENKO, I. D., RYNDICH, A. V. and NAZARENKO, L. A., Institute of Molecular
Biology and Genetics, Ukrainian SSR Academy of Sciences, Kiev

[Abstract] A review is presented on the isolation of reverse transcriptase in preparative quantities from avian myeloblastosis virus grown in Leghorn chicks. Optimum conditions for chick growth, infection with the virus, and harvesting of the virus are described. Studies on storage conditions have shown that addition of 50 µg/ml of dextran sulfate 500 to the medium results in retention of twice the activity of reverse transcriptase than seen after 1-2 years at -70°C without the dextran. Highly purified reverse transcriptase without nuclease activity was obtained in preparative quantities by zonal density gradient centrifugation in sucrose gradients ranging from 20 to 50%. Figures 5; references 54: 12 Russian, 42 Western.
[1524-12172]

UDC: 577.15.062

METAL-BONDING PROTEINS AND ALKALINE PHOSPHATASE ACTIVITY IN GIANT OYSTER IN ANTHROPOGENICALLY POLLUTED ENVIRONMENTS

Vladivostok BIOLOGIYA MORYA in Russian No 3, May-Jun 84
(manuscript received 28 May 82) pp 66-71

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Laboratory of Comparative Biochemistry, Institute of Marine Biology, Far
Eastern Scientific Center, USSR Academy of Sciences, Vladivostok 690022;
Laboratory of Geochemistry, Pacific Institute of Geography, Far Eastern
Scientific Center, USSR Academy of Sciences, Vladivostok 690032.

[Abstract] A study is presented of the bonding of zinc, copper and cadmium by cytoplasmic proteins. The study was performed with protein preparations

obtained from the digestive gland of the giant oyster *Crassostrea gigas* living in environments polluted by man. The activity of the zinc metal enzyme alkaline phosphatase in the organs of oysters taken from natural populations was also studied. The oysters were collected on two bars in Amur Bay near Popov Island in May and June. Analysis of the metal content of the oyster organs showed that the concentration of cadmium is about 10 µg/g in all of the organs studied except the muscles. Zinc concentration varied from 2500 to 5300 µg/g. The zinc content was approximately 3000 µg/g in the mantle, gonad and digestive gland of oysters from Skrebtsov Island, higher in oysters taken from near Popov Island. The data on metal content in the organs of the oysters indicate that the water in Amur Bay is relatively little polluted with metals, since the ability of these animals to accumulate large quantities of metals is well known. Copper and cadmium were not found in the protein fractions. No direct dependence was found between zinc concentration and activity of alkaline phosphatase, a result of the depressing influence of other elements present in high concentrations in the medium and in the organism on the enzyme. Figures 2; references 14: 4 Russian, 10 Western.
[1516-6508]

UDC 577.213.3:577.113.4

PHOSPHOAMIDE ANALOGS OF DEOXYRIBONUCLEOSIDE TRIPHOSPHATES AS SUBSTRATES OF *E. COLI* POLYMERASE 1

Moscow BIOORGANICHESKAYA KHIMIYA in Russian Vol 10, No 9, Sep 84
(manuscript received 26 Jan 84) pp 1183-1189

ZAGREBEL'NYY, S. N., ZAKABUNIN, A. I., MELAMED, N. V., ORESHKOVA, S. F. and KHRIPIN, Yu. L., Scientific Research Design and Technology Institute of Biologically Active Substances, Berdsk, Novosibirsk Oblast

[Abstract] Four 5'-amino-2',5'-dideoxyribonucleoside-5'-triphosphates (ndATP, ndTTP, ndCTP, ndGTP) were synthesized in order to evaluate the feasibility of using such congeners in DNA sequencing. An *E. coli* polymerase I system was used to show that such phosphoamides were incorporated into complementary DNA strands along with natural deoxytriphosphates. The yield of polymers with the phosphamide bonds was two-fold lower than obtained under otherwise identical conditions with polymers containing the phosphodiester bonds. Under the reaction conditions employed (12°C, pH 9), the phosphamide bonds in the resultant DNA were stable for 16-35 h; however, such bonds were rapidly hydrolyzed with 15% acetic acid. DNA molecules with phosphodiester bonds were unaffected under similar conditions. These facts indicate that the phosphamide analogs can be used for primary sequencing of DNA molecules in combination with DNA polymerase, creating a more facile system than generally available with the use of dideoxynucleoside triphosphates. Figures 4; references 16 (Western).
[1519-12172]

SYNTHESIS OF OLIGORIBONUCLEOTIDE DERIVATIVES BY LIGATION OF 2'-DEOXY-5'-PHOSPHOTHYMININE-3'-PHOSPHOTHIATE WITH PHAGE T4 RNA LIGASE: OLIGORIBONUCLEOTIDE DERIVATIVES WITH ALKYLATING GROUP ON 3'-END

Moscow BIOORGANICHESKAYA KHIMIYA in Russian Vol 20, No 9, Sep 84
(manuscript received 7 Feb 84) pp 1190-1198

OSHEVSKIY, S. I., BOGACHEV, V. S. and KUMAREV, V. P., Institute of Cytology and Genetics, Siberian Department, USSR Academy of Sciences, Novosibirsk

[Abstract] Conditions are described for the synthesis and isolation of 2'-deoxy-5'-phosphothymidine-3'-phosphotioate (pdTp_s) as part of ongoing studies on the synthesis of agents giving targeted modification of nucleic acids. PHage T4 RNA ligase was used to join pdTp_s to a hexaribonucleotide molecule ((Ap)₅A) to yield a mixed oligoribo(deoxyribo)nucleotide ((Ap)₅A). Subsequent use of N-methyl-N,N'-di-(2-chloroethyl)-N'-(p-formylphenyl)trimethylenediamine for the alkylation of (Ap)₆dTp_s-3'-phosphotioate resulted in the formation of the S-alkyl derivative as the sole product, containing the 2-chloroethyl functionality at the 3'-terminus of the oligonucleotide. Mild reduction of the formyl group of the S-alkyl derivative with sodium borohydride resulted in activation of the 2-chloroethylamino group (i.e., 95% intact 2-chloroethylamino groups). The synthetic conditions outlined lend themselves to the preparation of P-32-labeled congeners. The mixed oligoribo(deoxyribo)nucleotides with 3'-alkylating groups can be utilized for specific labeling of DNA and RNA in in vitro systems, and in affinity modification of enzymes that specifically interact with RNA. Figures 3; references 23: 13 Russian, 10 Western.

[1519-12172]

UDC 577.152.37:577.175.82/85

MASS SPECTROMETRY OF FLUORINATED PROSTAGLANDINS: COMPARISON OF ELECTRON IMPACT FRAGMENTATION OF 15-FLUORO-15-DEOXYPROSTAGLANDINS A₂, B₂, E₂ AND E₁ AND NATURAL ANALOGS

Moscow BIOORGANICHESKAYA KHIMIYA in Russian Vol 20, No 9, Sep 84
(manuscript received 27 Dec 83) pp 1260-1270

KOGTEV, L. S., SADOVSKAYA, V. L., RAZYNOV, B. V., BEZUGLOV, V. V. and BERGEL'SON, L. D., Institute of Bioorganic Chemistry imeni M. M. Shemyakin, USSR Academy of Sciences, Moscow

[Abstract] Comparative mass spectrometry was conducted on the fragmentation patterns of methyl, trimethylsilyl, and tert-butyl-dimethylsilyl ethers of 15-fluoro-15-deoxy congeners of prostaglandins A₂, B₂, E₂ and E₁, and of the naturally-occurring compounds, since it has been demonstrated that the fluoro-analogs often exhibit greater selectivity of biological action and enhanced metabolic stability. Fragmentation of the fluoro-analogs led to

preferential elimination of HF from the molecular or fragment ions, with the formation of a 15,16-double bond which hindered the separation of the pentyl radical $C_5H_{11}^{\cdot}$. Loss of the pentyl radical is a characteristic fragmentation features of the naturally-occurring prostaglandins. Figures 5; references 13: 4 Russian, 9 Western.
[1519-12172]

UDC: 616-009,24-02:615.221-059:615.214.25

REGULATION OF RAT LIVER MITOCHONDRIA PYRUVATEDEHYDROGENASE ACTIVITY BY 18-CROWN-6, ITS COMPLEXES WITH MAGNESIUM AND CALCIUM CHLORIDES

Kiev DOKLADY AKADEMII NAUK UKRAINSKOY SSR, SERIYA B: GEOLOGICHESKIYE, KHIMICHESKIYE I BIOLOGICHESKIYE NAUKI in Russian No 7, Jul 84
(manuscript received 10 Jan 84) pp 60-63

BOGATSKIY, A. V. (deceased), academician, Ukrainian Academy of Sciences, GOLOVENKO, N. Ya., KARASEVA, T. L., LUK'YANENKO, N. G., SHURDUK, Zh. N. and LYAMTSEVA, L. N., Physics and Chemical Institute, Ukrainian SSR Academy of Sciences, Odessa

[Abstract] Experimental data are presented on the possibility of using crown esters, particularly 18-crown-6 and its complexes with magnesium and calcium chlorides, to regulate the pyruvate dehydrogenase activity of rat liver mitochondria. The compounds studied were administered to white rats intraperitoneally at a dose of 50 mg/kg body weight for five days. Rat liver mitochondrial suspensions with the addition of the compounds tested were incubated at 37°C, pH 7.4 for 30 minutes. 18-Crown-6 increased the activity of the enzyme system by more than a factor of two. The presence of magnesium and calcium cations also increased the activity of the complex from 7 to 12 and 16 nmol/min per mg of protein. The compounds studied, except for 18-crown-6 . $MgCl_2$, did not change the protein content in the rat liver mitochondria. As the content of 18-crown-6 in the incubation medium increases, therefore, chelation of Mg^{2+} ions by the crown ester occurs, decreasing the activity of the enzyme complex. Figures 2; references 10: 9 Russian, 1 Western.
[1622-6508]

EUROPEAN BIOCHEMISTRY CONFERENCE IN MOSCOW

Moscow NEDELYA in Russian No 29 (1269) 16-22 Jul 84 pp 20-21

AL'BATS, Ye.

[Abstract] The Federation of European Biochemical Societies recently held its 16th conference in Moscow. This article presents a popularized description of some of the subjects discussed and some of the people who discussed them, such as Georgiy Pavlovich Georgiyev, chief of the Laboratory of Biosynthesis of Nucleic Acids, Institute of Molecular Biology, USSR Academy of Sciences.

Georgiyev discussed the theory of heredity and the nature of molecular biology and biochemistry. In particular, the capabilities of gene engineering are discussed. A round-table discussion chaired by Robert Weinberg of MIT is described on the subject of cancer and its relationship to genetic regulation of cell division. It was mentioned at the conference that industrial technologies are now utilizing cells, enzymes or new forms of life created by gene engineering. Rem V. Petrov, director of the Institute of Immunology, USSR Academy of Medical Sciences, discussed his latest book, written with V. A. Kabnov, on the subject of possible creation of artificial vaccines, a dream of biologists since Pasteur. Closing the conference, the new president of the council, Academician Yuri A. Ovchinnikov, echoed the words of Linus Pauling that he is happy to be a scientist, happy to have made some discoveries and happy that others will continue to make them.
[831-6508]

UDC: 577.352.2:577.352(333+335)

STUDY OF LIPIDS AND THEIR MOLECULAR ORGANIZATION IN ARTIFICIAL AND BIOLOGICAL MEMBRANES

Moscow BIOLOGICHESKIYE MEMBRANY in Russian Vol 1, No 8, Aug 84
(manuscript received 12 Apr 84) pp 794-813

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[Abstract] This article reviews work performed in the laboratory of lipid chemistry of the author's institute since 1962. Data are presented on the discovery of previously-unknown lipids and on determination of their structure, including the results of investigation of diol lipids and unusual lipids of microorganisms. Work on the synthesis of fatty acids and phospholipids is also described. The lipids of tumor cells are discussed, as well as the molecular organization of lipids in membranes. The study of prostaglandins is described, including chemical modification of prostaglandins and the interaction of prostaglandins with membranes and lipoproteins. References 180: 150 Russian, 30 Western.
[1616-6508]

STRUCTURE AND COMPOSITION OF SYNTHETIC WATER-SOLUBLE POLYELECTROLYTE
COMPLEXES WITH FORMATE DEHYDROGENASE AND ALCOHOL DEHYDROGENASE

Moscow BIOKHIMIYA in Russian Vol 49, No 8, Aug 84
(manuscript received 31 Oct 83) pp 1300-1309

DIKOV, M. M., OSIPOV, A. P., YEGOROV, A. M., BEREZIN, I. V., MUSTAFAYEV, M. I.
and KABANOV, V. A., Chemistry Faculty, Moscow State University
Imeni M. V. Lomonosov

[Abstract] A study is presented of the nature of interaction of various water-soluble polyelectrolytes with bacterial formate dehydrogenase and alcohol dehydrogenase from horse liver, as well as the structure of the complexes formed. The formate dehydrogenase was isolated from gram-negative methylo-trophic bacteria *Achromobacter parvulus* 1. Complex formation of formate dehydrogenase plus polycations were studied by sedimentation analysis at pH 7.0 - 7.5 at various molar ratios. The formation of complexes of formate dehydrogenase with polymers containing both negative and positive groups at pH 6.5 was established by sedimentation rate analysis. The same method was used to study the interaction of formate dehydrogenase with hydrophobic polycations. The results of the study agreed qualitatively with data on complex formation of the same polymers with calf serum albumin and gammaglobulin, indicating that the interaction of these polyelectrolytes with proteins is of the same nature. The same types of interactions occur in all cases, leading to the formation of two types of complexes. Interaction with polycations is cooperative in nature. Figures 7; references 20: 12 Russian, 8 Western.
[1595-6508]

PROTEOLYTIC ENZYMES HYDROLYZING OPIOID PEPTIDES IN CYTOPLASM OF HUMAN
ERYTHROCYTES

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 277, No 4, Aug 84
(manuscript received 23 Feb 84) pp 992-995

ALEKSEYENKO, L. P., POZDNEV, V. F. and OREKHOVICH, V. N., active member,
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Chemistry, USSR Academy of Medical Sciences, Moscow

[Abstract] A report is presented on the hydrolysis of several opioid peptides by human erythrocyte proteolytic enzymes. Peptides include leukoencephalin, the tyrosyl-glycyl-glycine tripeptide, tyrosine-4-methyl-cumarine-7-amide, β -casomorphine-7. High aminopeptidase activity for hydrolysis of tyrosine-methyl-cumarine amide and tyrosyl-glycyl-glycine on tyrosine and diglycine are found in preparations obtained from hemolysate after removal of

hemoglobin and acid proteinase, It was found that at least one of the neuro-peptidases, aminopeptidase, is present in the cytoplasm of human erythrocytes. It seems to differ from aminopeptidases previously discovered in human erythrocytes and has similarity to soluble aminopeptidase from the cytosol fraction of brain cells. Human erythrocytes, equipped with highly active aminopeptidase, inactivating opioid peptides, thus can apparently be included in the regulation of the concentration of these biologically-active compounds in the organism. Figure 1; references 15: 2 Russian, 13 Western. [815-6508]

BIOPHYSICS

UDC 615.332(Amphotericinum)].015.4:616-008.939.15

EFFECTS OF ALKYL DERIVATIVES OF AMPHOTERICIN B ON CONDUCTIVITY OF BILAYER LIPID MEMBRANES

Moscow ANTIBIOTIKI in Russian Vol 29, No 7, Jul 84
(manuscript received 16 Dec 83) pp 513-516

KASUMOV, Kh. M., MALAFRIYEV, O. K. and VAYNSHTEYN, V. A., Physicochemical Biology Section, Institute of Physics, Azerbaijan SSR Academy of Sciences, Baku; All-Union Scientific Research Technological Institutes of Antibiotics and Enzymes, Leningrad

[Abstract] Bilayer lipid membranes simulating yeast and mammalian membranes were tested for the effects of alkyl derivatives of amphotericin B on their electrical conductivity as an indication of the selectivity of action. Assessment of action was conducted on the basis of conductivity measurements and conduction relaxation time constants for the removal of a given antibiotic from the bathing medium. The derivatives and amphotericin B were found to induce a channel-dependent type of conductivity. Furthermore, determination of the relaxation time constant showed that for ergosterol/phospholipid membranes the relation constants were much greater than for the cholesterol/phospholipid membranes (simulating mammalian membranes). These observations indicate that the toxicity of amphotericin B and its analogs is much greater for the fungal membranes. In addition, of the congeners tested (methyl-, ethyl-, propyl- and butyl-derivatives), the butyl-derivative was least toxic for the simulated mammalian membrane with a relaxation time of 0.46 min at pH 7.0 (i.e., the analog with the longest alkyl chain), with the relaxation constants for the other derivatives ranging from 1.5 (propyl) to 8.4 (ethyl) to 38 min (methyl). Figures 2; references 7: 2 Russian, 5 Western.
[1529-12172]

SUBSTRATE SPECIFICITY OF BETA-LACTAMASE OF CLINICAL STRAINS OF GRAM-NEGATIVE BACTERIA

Moscow ANTIBIOTIKI in Russian Vol 29, No 9, Sep 84
(manuscript received 11 Apr 84) pp 657-661

SAZYKIN, A. Yu. and NAVASHIN, S. M., All-Union Scientific Research
Institute of Antibiotics, Moscow

[Abstract] Beta-lactamase substrate specificity determinations of six species of Enterobacteriaceae (Enterobacter, Citrobacter, Escherichia, Klebsiella, Proteus, Serratia) showed that, in terms of susceptibility to inhibition by dicloxacillin and pCMB, the beta-lactamases fell into one of the five Richmond classes [Richmond, MH, and Sykes, RB, Adv. Microbiol. Physiol., 9: 31-38, 1973]. Penicillinase-type beta-lactamase was the enzyme most frequently detected, while three of the 46 clinical isolates (e. aerogenes 6803, E. aerogenes 11030, K. pneumoniae 970) possessed enzymes falling into two different classes. Of the nine antibiotics tested (benzylpenicillin, ampicillin, carbenicillin, oxacillin, methicillin, cephaloridine, cephalothin, cephalixin, dicloxacillin), cephalixin and dicloxacillin were shown to be most refractory to hydrolysis. Figure 1; references 5 (Western).
[1530-12172]

UDC 58.08

DETERMINATION OF FLUORESCENCE AND FUNCTIONAL STATUS OF PHYTOPLANKTON PHOTOSYNTHETIC SYSTEM BY IMMERSIBLE INDUCTOFLUORIMETER

Kiev GIDROBIOLOGUCHESKIY ZHURNAL in Russian Vol 20, No 3, May-Jun 84
(manuscript received 11 May 82) pp 88-92

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[Abstract] A description is provided of a device designed to measure phytoplankton fluorescence in an aqueous environment. The device consists of an immersible apparatus with a fluorimeter and sampling chamber with technical capacity for simultaneous recording of fluorescence induced by blue light (450 nm, 65 W/m²), which is due to activation of chlorophyll a, and by yellow-green light (550 nm, 114 W/m²) which excites phycocyanin and chlorophyll c. The apparatus can operate in either of two modes, in the first of which a recording is obtained of the vertical distribution of phytoplankton fluorescence, and in a second mode in which induced transitions in fluorescence are measured for a given horizontal stratum. The device has been successfully tested for biological monitoring at the Krasnoyarsk Reservoir in 1979-1981. Figures 5; references 20: 14 Russian, 6 Western.
[1513-12172]

EFFECT OF CHEMICAL AND ENZYMATIC MODIFICATION OF BACTERIORHODOPSIN ON
PURPLE MEMBRANE STRUCTURE

Moscow BIOLOGICHESKIYE MEMBRANY in Russian Vol 1, No 4, Apr 84
(manuscript received 9 Dec 83) pp 349-355

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[Abstract] Microcalorimetry, circular dichroism and freeze fracture electron microscopy were used to study the effect of various protein modifications on the purple membrane of Halobacterium halobium. Cleavage of C-terminal residues 232-248 from the bacteriorhodopsin, using papain, disturbed the hexagonal protein packing of the membrane P-surface and led to the formation of separate intramembrane particles. This cleavage also caused a shift in the heat absorption maximum observed in the thermogram from 88° to 83°, indicating destabilization of the membrane. Heating led to vesicle formation, as in unmodified membrane, however with almost complete disruption of hexagonal packing. Transformation of the bacteriorhodopsin to bacterioopsin, with hydroxylamine and light, resulted in the formation of spherical vesicles and hemispheres, as well as packing disruption and a shift in the thermogram maximum to a temperature of 68°. Reduction of the bacteriorhodopsin Schiff base led to membrane stabilization. Heating to 85° gave smaller vesicles. When more than 95% of the tryptophan residues in the bacteriorhodopsin were replaced by 5-fluorotryptophan, changes in the low-temperature region of the thermogram with no alterations in membrane structure and vesicle formation were observed. Vesicle formation reversibly decreased ellipticity in the circular dichroism spectrum, suggesting identical spiralization in the flat membrane and the vesicles. All of the pigment modifications slightly increased spiralization, as reflected by an increase in ellipticity at 220 nm. Figures 4; references 12: 2 Russian, 10 Western.
[1564-12126]

TRANSFER OF ALKALI AND ALKALINE EARTH IONS ACROSS BIPOLAR LIPID MEMBRANES IN PRESENCE OF CERTAIN PHOSPHORUS-CONTAINING MACROCYCLES

Moscow BIOLOGICHESKIYE MEMBRANY in Russian Vol 1, No 4, Apr 84
(manuscript received 24 Aug 83, after revision 3 Jan 84) pp 379-383

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[Abstract] The effect of four phosphorus-containing crown ethers, dibenzomethylphosphonyl-14-crown-5 (I), dibenzomethylthiophosphonyl-14-crown-5 (II), dibenzomethylphosphonyl-20-crown-7 (III) and dibenzoadamantylphosphonyl-17-crown-6 (IV) on the potassium, sodium, calcium and magnesium ion conductivity of a lipid bilayer membrane was studied using membrane formed from a solution of total rabbit brain lipids in decane. Compound IV had the highest ionophoric activity and maximal potassium/sodium selectivity (about 100). Compound II increased membrane conductivity in the presence of all ions except magnesium. Compounds I and III were inactive at concentrations up to 4×10^{-4} M and 3.6×10^{-5} M, respectively. Higher concentrations were not tested due to the limited solubility of the macrocycles. Using Dreiding models, it was demonstrated that compounds I-III may assume two conformations, in one of which the methyl group sterically hinders metal ion binding. Atom-atom potential calculations indicate that complexation occurs mainly at the phosphorus. Changes in the spectrum of compound IV when calcium perchlorate is added indicate that both the phosphoryl and anisole oxygens participate in complexation. Compound IV appears to form a sandwich complex. The radius of the cavity formed corresponds to the crystallographic radius of the potassium ion, leading to the selectivity observed. Compound IV is also the most lipophilic of the compounds tested. Figure 1; references 23: 12 Russian, 11 Western.
[1564-12126]

KINETICS OF ACETYLCHOLINE INTERACTION WITH CHOLINORECEPTORS IN MOLLUSK NEURONS

Moscow BIOLOGICHESKIYE MEMBRANY in Russian Vol 1, No 4, Apr 84
(manuscript received 31 Aug 83, after revision 11 Nov 83) pp 384-388

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[Abstract] The interaction of acetylcholine with pond snail cholinoreceptors was studied using the potential jump relaxation method. Membrane potential

was shifted with square-wave impulses of -45 to -50 mV in the direction of hyperpolarization, under conditions in which the majority of the receptors were not desensitized. The change in membrane conductivity was a first order exponential function of time divided by a constant, τ . τ was an exponential function of the final potential, with potential having a greater effect on τ at lower temperatures. The reciprocal of τ was also a function of acetylcholine concentration; this function was linear above 3 μM . The intercept of this line was a function of the final potential and its reciprocal corresponded to the mean time that a channel is found in the open or relaxed state. This time was determined to be 32 msec. The slope was a strong function of temperature, while the intercept changed only slightly with temperature. Final membrane conductivity can be expressed as the product of the number of receptors, the mean conductivity of an open channel, the rate of channel opening and τ . The experimental data confirmed this expression, in that final conductivity and τ demonstrated the same dependence on final potential. The results are consistent with data found in the literature for other systems. Figures 5; references 17: 2 Russian, 15 Western.
[1564-12126]

UDC 577.352.6

LIPID MOLECULE SHAPE AND MONOLAYER FUSION OF MEMBRANES

Moscow BIOLOGICHESKIYE MEMBRANY in Russian Vol 1, No 4, Apr 84
(manuscript received 2 Dec 83) pp 411-427

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[Abstract] The mechanism of membrane monolayer fusion was studied theoretically and experimentally. Since the spontaneous curvature of a lipid membrane is determined by the shape of its constituents, the energy of the cross-piece, postulated in the "stalk" hypothesis of membrane fusion, was expressed in terms of the elasticity, spontaneous curvature and thickness of the monolayer, as well as stalk radius. This expression was then used to derive an equation for the mean stalk formation time, or fusion time, in terms of energy, fluctuation frequency and temperature. The logarithm of this term is a function of elasticity, temperature, monolayer thickness, curvature and concentration and distribution of components. A similar expression was derived for the energy of the edges of membrane pores. Both equations contained the same dependence on elasticity, component curvature, distribution coefficient and layer thickness, so that stalk formation measurements could be used to calculate pore energy and this result compared to results of studies on electromechanical stability. In order to verify the expressions derived, experiments were conducted with membranes formed from lecithin, lysolecithin, azolecithin, phosphatidylethanolamine, cardiolipin and cholesterol. Linear pore tension was measured as mean membrane-lifetime under applied voltage and plotted versus voltage. The presence of solvent strongly influence membrane

fusion. Fusion time varied from less than one second to 410 seconds, depending on membrane composition, and was increased by the addition of cholesterol. Lysolecithin at low concentrations also delayed membrane fusion, while high concentrations (above 10^{-3} mg/ml) led to membrane breakage. Membranes of erythrocytes brought into contact using dielectrophoresis exhibited irreversible fusion (chain formation) which was not reversed by pronase but could be prevented by addition of lysolecithin. The data demonstrate the decisive role of lipid shape and spontaneous curvature in monolayer fusion. Experimental results were in close agreement with theoretically calculated parameters. Processes similar to those studied, including the "stalk" mechanism of fusion, may also occur in the interaction of biological membranes. Figures 7; references 48: 9 Russian, 39 Western, [1564-12126]

UDC: 577.354.2/.27

BIOORGANIC CHEMISTRY OF VISUAL PROCESS

Moscow BIOLOGICHESKIYE MEMBRANY in Russian Vol 1, No 8, Aug 84
(manuscript received 21 May 84) pp 775-793

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[Abstract] Recently published data obtained in the area of the bioorganic chemistry of vision are reviewed. The structural principles of the functioning of rhodopsin and enzymes participating in transmission of information from pigment molecule to plasmatic membrane in the visual cell are analyzed. It is found that after absorption of a quantum of light by the retina, rhodopsin undergoes photo-induced conversions for several minutes. The amino acid sequence of rhodopsin is presented. The membrane portion of the rhodopsin molecule consists of seven polypeptide chain segments in alpha-spiral conformation, penetrating through the photoreceptor membrane. Visual process intermediates which enter into the visual process after absorption of a quantum of light are described, as are the enzymes active in the outer segments of the visual cells. The topography of a rhodopsin molecule in the photoreceptor membrane is illustrated. A model is developed of the light-activated cascade of amplification of a visual signal, which is dependent on cyclic nucleotides. In conclusion, the stages of the visual process occurring at the visual cell level are listed. References 139: 7 Russian, 132 Western. [1616-6508]

PRODUCTION OF FLUORINE-CONTAINING AND SPIN-LABELED DERIVATIVES OF
BACTERIORHODOPSIN AND STUDY BY ^{19}F -NMR- AND EPR-SPECTROSCOPY

Moscow BIOLOGICHESKIYE MEMBRANY in Russian Vol 1, No 8, Aug 84
(manuscript received 11 May 84) pp 838-857

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[Abstract] A method is suggested for selective modification of bacteriorhodopsin at the alpha-amino- and alpha-carboxyl groups in areas of limited proteolysis. The inclusion of spin label ^{13}C - and ^{19}F - containing groups in bacteriorhodopsin by chemical modification is described. The derivatives produced are studied by EPR and NMR spectroscopy. By using the mild acetylating reagent acetoxysuccinimide the authors succeeded in selectively modifying the accessible lysine group. Acetylation at pH 10.5 included about three moles of acetyl groups in the bacteriorhodopsin molecule according to radioactivity measurements. Acetylation at pH 9.5 of bacteriorhodopsin leads to the inclusion of 0.5 - 1.2 moles of acetyl groups per mole of protein. Acetylation of bacteriorhodopsin causes the capability for regeneration of the purple complex to drop by 10 or 20%. The modification of amino- and carboxyl groups in areas of limited proteolysis of bacteriorhodopsin is studied. The chemical modification of bacteriorhodopsin in ether is described. The properties and optical investigation of modified bacteriorhodopsin derivatives are described. Trifluoroacetylated derivatives of bacteriorhodopsin are studied by ^{19}F - NMR. The results produced confirm the mobility of the C-terminal fragment of the molecule including the KGly²³¹ and Ser²³⁹ groups. It is shown that the covalent bond with retinylidene or retinyl groups is important in stabilization of the three-dimensional structure of the molecule. The primary influence of the spin label at the Met⁶⁸ position on chemical changes in trifluoroacetyl groups is confirmed. Figures 11; references 56: 41 Western, 15 Russian.
[1616-6508]

TOXIC COMPONENTS OF VENOM OF CENTRAL ASIAN SCORPION ORTHOCHIRUS
SCORBICULOSUS

Moscow BIOORGANICHESKAYA KHIMIYA in Russian Vol 10, No 8, Aug 84
(manuscript received 3 Apr 84)(pp 1100-1108)

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[Abstract] The venom of the black scorpion *O. scorbiculosus* obtained by electrical stimulation was found to have significantly greater toxicity than that of the scorpion *B. eupeus*. This venom is a multicomponent mixture containing at least 10 to 12 different proteins. The method of separation of the individual neurotoxins is based on ion-exchange chromatography on cellulose in a pH gradient. Four toxins labeled Os-1 - Os-4 were isolated. The amino acid composition of the toxins was determined. The activity of each of the four toxins is greater than the toxicity of the whole venom. All four toxins are similar to the polypeptide toxin of *B. eupeus*, containing 66 or 57 amino acid groups with 4 intramolecular disulfide bonds. Os-1 contains a methionine group, not characteristic for the toxins of other scorpions. Figures 8; references 13: 6 Russian, 1 Western.
[385-6508]

ENZYMES AS INVENTIONS

Kiev UKRAINSKIY BIOKHMICHESKIY ZHURNAL in Russian Vol 56, No 5, Sep-Oct 84
(manuscript received 10 Apr 84) pp 587-592

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[Abstract] The problem of patent protection in enzymology, as practiced in the USSR, is reviewed with the intention of providing criteria that are currently utilized in assigning Soviet patents. Some, but not all, of the criteria that must be met are enhanced thermostability, enhanced stability with respect to other factors (pH, metals, etc.), higher substrate specificity in comparison with analogous enzymes, unique biological properties that favor its application to medicine (human and veterinary), recognition of "novel" DNA sequences (i.e., restriction sites), greater catalytic activity than analogous enzymes, and a unique source of isolation. Such characteristics appear to be sufficient in most cases for rendering a patent decision, and should go a long way in encouraging enzyme-based biotechnological advances. Figures 2; references 4 (Russian).
[1524-12172]

UDC 577.4:001.5

INFLUENCE OF SATURATION FACTOR ON DYNAMICS OF CLOSED ECOLOGICAL SYSTEMS

Moscow ZHURNAL OBSHCHEY BIOLOGII in Russian Vol 45, No 4, Jul-Aug 84 (manuscript received 24 Jun 83) pp 480-484

[Article by B. I. Yatsalo, Mechanico-Mathematical Faculty, Moscow State University imeni M. V. Lomonosov]

[Text] With the most general assumptions about trophic functions, the author studied the possibility of the existence of periodic modes in closed ecological systems of the type of a linear trophic chain. He found conditions for the parameters of the system at which the above modes occur in chains of a length of two and higher.

The detection of a periodic solution (cycle) and the study of its evolution during changes of the parameters of the system are of great importance for the investigation of the complex dynamic behavior in biophysical systems described by ordinary differential equations. Changes in the parameters of a system can lead, for example, to such complex modes as a toroidal motion (Marsden, Mak-Kraken, 1980), or to the appearance of chaos ("Strannyye attraktory" [Strange Attractors], 1981; Alekseyev, Kornilovskiy, 1982).

In studying the problem of the existence of cycles in one or another biophysical system, trophic or other functions are, as a rule, either considered as linear (Vol'terra's type -- Vol'terra, 1976), or the parametrization of these functions of the (1.4) type is taken, when the saturation factor is taken into consideration (Bazykin, Khibnik, 1981; Alekseyev, 1973; Alekseyev, Kornilovskiy, 1982).

In this work, the ecological system is a matter-closed linear trophic chain. Following A. N. Kolmogorov (1972), it is possible to have only very general requirements for trophic functions. This will be quite enough for proving the possibility of the existence of periodic modes in chains of a length of two and higher and for finding appropriate conditions. Let us examine general properties of closed linear chains.

1. A general view of a closed linear trophic chain is shown in Figure 1 (for details on trophic chains, see Svirezhev, Logofet, 1978). Here, x_j -- biomass (or quantity) of the population of a j -th level, $j = 1, \dots, n$, x_0 -- life, m_j -- natural death coefficient, $v_i(x)$ -- trophic functions, $i = 0.1, \dots, n-1$.

Using the closed-state condition,

$$\sum_{j=0}^n x_j = c = \text{const}, \quad (1.1)$$

the dynamics of the trophic chain can be represented in the form of the following system of ordinary differential equations:

$$\begin{aligned} \dot{x}_1 &= x_1 \left(-m_1 + v_0 \left(c - \sum_{j=1}^n x_j \right) - u_1(x_1) x_2 \right), \\ \dot{x}_i &= x_i \left(-m_i + v_{i-1}(x_{i-1}) - u_i(x_i) x_{i+1} \right), \\ i &= 2, \dots, n, \quad x_{n+1} = 0. \end{aligned} \quad (1.2)$$

Here, $v_i(x) = x u_i(x)$, $\dot{x}_i = \frac{d}{dt} x_i(t)$.

About the trophic functions $v_i(x)$, $x \geq 0$, let us make the following assumptions (Figure 2): they are smooth and

$$\begin{aligned} v_i(0) &= 0, \quad v_i'(x) > 0, \quad v_i(x) \rightarrow \bar{v}_i < \infty, \\ v_i'(x) &\rightarrow 0 \quad (x \rightarrow \infty), \quad i = 0, \dots, n-1. \end{aligned} \quad (1.3)$$

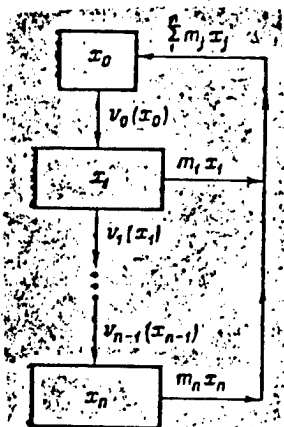


Figure 1. Closed linear trophic chain of an n length.

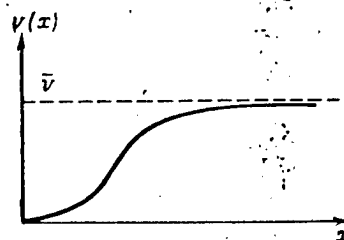


Figure 2. General view of the trophic function $v_i(x)$, $i=0, 1, \dots, n-1$.

As a rule, functions from the following family are considered as functions of (1.3):

$$v(x) = \frac{ax^s}{1+bx^s}, \quad s > 1. \quad (1.4)$$

Having defined $v_0(x)$ on semiaxis $x < 0$ with respect to oddness, we shall examine the trajectories of the system (1.2) in the entire positive orthant $R_+^n = \{x = (x_1, \dots, x_n) \in R^n: x_j > 0, j=1, \dots, n\}$. It is evident that from $x_i(t_0) = 0$

follows $x_i(t) \equiv 0$, therefore it follows from the theorem of existence and uniqueness that the positive orthant is invariant: if $x(t_0) \in R_+^n$, then $x(t) \in R_+^n$ for all $t \in R$.

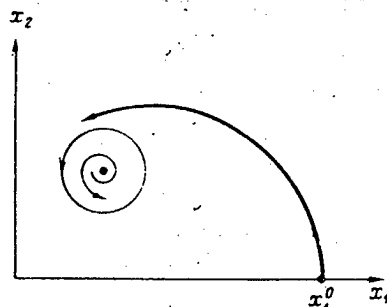


Figure 3. Separatrix and Stable Maximum Cycle in Plane (x_1, x_2) .

It can be seen from (1.2) that, if $m_k \geq \bar{v}_{k-1}$, then $x_i(t) \rightarrow 0$ at $t \rightarrow \infty$, $k \leq i \leq n$, i.e., populations with numbers $i \geq k$ are dying out. Therefore, hereafter we shall consider that $m_i < \bar{v}_{i-1}$, $i=1, \dots, n$.

Let us assume that $\|x\| = \sum_{i=1}^n x_i$ is the norm of vector $x=(x_1, \dots, x_n)$ in R_+^n .

Lemma. Correctness of the condition (1.1) for the system (1.2). For any trajectory $x(t)$ of the system (1.2) there exists $T > 0$ such that $\|x(t)\| < c$ for all $t \geq T$.

Proof. Adding n equations of the system (1.2), we shall have

$$\frac{d}{dt} \|x\| = - \sum_{i=1}^n m_i x_i + v_0 (c - \|x\|) x_1. \quad (1.5)$$

It can be easily seen from this that, if in the time interval $[0, t_0]$, $\|x(t)\| \geq c$,

then $\|x(t)\| \leq \|x(0)\| \cdot \exp(-mt)$, $m = \min_{j \leq i \leq n} m_j$. Consequently, as a result of the

exponential decrease of the norm $\|x(t)\|$, the trajectory $x(t)$ will enter the domain $\|x\| < c$, however, as can be seen from (1.5), the trajectory will no longer be able to leave it.

Hereafter, $F=(F_1, \dots, F_n)$ will be used to denote the function of the right parts of the system (1.2), and $dF(x) = \|a_{ij}\|$ will denote Jacobi's matrix, $a_{ij} = \frac{\partial F_i(x)}{\partial x_j}$.

2. Let us examine in detail trophic chains of length $n=2$. They satisfy the following system of equations

$$\begin{aligned} \dot{x}_1 &= x_1(-m_1 + v_0(c - x_1 - x_2) - u_1(x_1)x_2), \\ \dot{x}_2 &= x_2(-m_2 + v_1(x_1)). \end{aligned} \quad (2.1)$$

Let us study all stationary points of this system in the domain $x_j \geq 0$, $j=1,2$.

a) Points $A_0=(0,0)$ and $A_1=(x_1^0,0)$ are found easily:

$$x_1^0 = c - c_0, \quad (2.2)$$

$$v_0(c_0) = m_1. \quad (2.3)$$

Let us determine c_1 from the equation

$$v_1(c_1 - c_0) = m_1. \quad (2.4)$$

Then points A_0 and A_1 are saddle points at $c > c_1$ and the separatrix goes from A_1 into R_+^2 (Figure 3).

b) The third and last stationary point of (2.1) is $A_2=(x_1^*, x_2^*)$:

$$x_1^* = c_1 - c_0, \quad (2.5)$$

and $x_2^* = x_2^*(c)$ is determined from the equation

$$v_0(c - x_1^* - x_2^*) = m_1 + u_1(x_1^*)x_2^*. \quad (2.6)$$

Having assumed that $x_0^* = c - x_1^* - x_2^*$, we rewrite (2.6) in the following form

$$v_0(x_0^*) = m_1 + u_1(x_1^*)(c - x_1^* - x_0^*). \quad (2.7)$$

Point x_0^* is found as an intersection of curve $y=v_0(x)$ with a straight line:

$$y = -u_1(x_1^*)x + u_1(x_1^*)(c - x_1^*) + m_1.$$

Applying (2.3) and (2.5) to (2.6) and (2.7), we conclude that at $c > c_1$ there always exists $x_2^* > 0$. It can also be easily seen that at $c > c_1$

$$x_0^*(c) > c_0, \quad \frac{d}{dc} x_0^*(c) > 0, \quad \frac{d}{dc} x_2^*(c) > 0$$

and at $c \rightarrow \infty$

$$x_0^*(c) \rightarrow \infty, \quad x_2^*(c) \rightarrow \frac{\bar{v}_0 - m_1}{u_1(x_1^*)}. \quad (2.8)$$

Hereafter we consider that $c > c_1$.

Let us study point A_2 for stability. Calculation of the eigenvalues of the matrix $dF(A_2) = \|a_{ij}\|$ gives

$$\lambda_{1,2} = \frac{1}{2} (a_{11} \pm \sqrt{a_{11}^2 + 4a_{12}a_{21}}) = \frac{1}{2} (a_{11} + \sqrt{D}). \quad (2.9)$$

Since $a_{12}a_{21} < 0$, then $\sqrt{D} < |a_{11}|$ at $D > 0$, therefore always

$$\operatorname{sign} \operatorname{Re} \lambda_1 = \operatorname{sign} \operatorname{Re} \lambda_2 = \operatorname{sign} a_{11}. \quad (2.10)$$

The sign of $a_{11} = a_{11}(c)$ coincides with the sign of

$$a(c) = -v_0'(x_0^*(c)) - u_1'(x_1^*) x_2^*(c). \quad (2.11)$$

If $u_1'(x_1^*) \geq 0$, then $a(c) < 0$ and point A_2 is stable (asymptotically) for all $c > c_1$. An elementary study of functions (1.3) shows that the inequality $u_1'(x) < 0$ is necessarily fulfilled for a certain $x = x_0$, and if $v_1''(x) < 0$ at $x \geq x_0$, then $u_1'(x) < 0$ for all $x \geq x_0$. The condition $v_1''(x) < 0$, $x \geq x_0$ is quite natural for a certain, possibly sufficiently large, x_0 (it is fulfilled for functions (1.4)) and means a steady decrease of $v'(x)$ in the interval $[x_0, \infty)$, therefore, let us add it to (1.3). Since $v_1(x_1^*) = m_2$, the inequality $u_1'(x_1^*) < 0$ is fulfilled at all $m_2 > m_2^0$, where m_2^0 depends exclusively on the function $v_1(x)$.

Hereafter we shall assume that

$$m_2 > m_2^0, \quad u_1'(x_1^*) < 0. \quad (2.12)$$

Let us study the function $a(c)$.

1) $c \rightarrow c_1 + 0$ (i.e., c tends to c_1 on the right). Then $c - x_1^* \rightarrow c_0$, $c_0 < x_0^* = c - x_1^* - x_2^* < c - x_1^*$, i.e., $x_0^*(c) \rightarrow c_0$, $x_2^*(c) \rightarrow 0$. It means that $a(c) \rightarrow -u_0'(c_0)$. Therefore, point A_2 is stable for the values of c which are close to c_1 .

2) $c \rightarrow \infty$. Then, (2.8) $v_0'(x_0^*(c)) \rightarrow 0$ and

$$a(c) \rightarrow -u_1'(x_1^*) \frac{\bar{v}_0 - m_1}{u_1(x_1^*)}.$$

The diagram of function $a(c)$ can be rather complex, however, it is important to us that in the case of (2.12) there always exists c_* , $c_1 < c_* < \infty$, such that

$$a(c) > 0, \quad c > c_*. \quad (2.13)$$

Taking into consideration (2.10), (2.13) and the lemma, we obtain the following result.

Theorem. In the case of $u_1'(x_1^*) < 0$, there exists such a c_* that, at $c > c_*$, the system (2.1) has a stable limiting cycle.

It should be mentioned that, for the system (2.1) depending on the parameter c , the appearance of a limiting cycle in the case of (2.12) is common as a result of Khopf's bifurcation (Bautin, Leontovich, 1976; Marsden, Mak-Kraken, 1980). However, if an unstable limiting cycle appears in the vicinity of A_2 (as is shown by the study of the first Lyapunov's value (Bautin, Leontovich, 1976) of the system (2.1) at the point A_2 , it can change its sign), then the system (2.1) has at least two limiting cycles.

It is possible to make the following conclusion from the above: in closed trophic chains of the length two, it is possible to have both a soft, and a rigid mode of the excitation of autooscillations.

3. Using the results of the preceding point, let us prove that periodic solutions are also possible in the system (1.2) at $n > 2$ and show the conditions under which they exist.

Let us assume that we know how to find conditions at which a nondegenerated cycle¹ of a $(n-1)$ -dimensional system of (1.2) exists in R_+^{n-1} . Let us now examine an n -dimensional system of (1.2) in which

$$v_0(x) = \frac{w(x)}{\varepsilon}, \quad m_1 = \frac{m}{\varepsilon}, \quad (3.1)$$

where $\varepsilon > 0$ -- minor parameter, $w(s)$ -- function of the type of (1.3) and $\bar{w}=1$, $0 < m \ll 1$. Then the system (1.2) can be written in the following form:

$$\begin{aligned} \varepsilon \dot{x}_1 &= x_1 \left(-m + w \left(c - \sum_1^n x_i \right) - \varepsilon u_1(x_1) x_2 \right), \\ \dot{x}_i &= x_i (-m_i + v_{i-1}(x_{i-1}) - u_i(x_i) x_{i+1}), \\ i &= 2, \dots, n, \quad x_{n+1} = 0. \end{aligned} \quad (3.2)$$

Hereafter we shall use the results of Anosov's work (1960). At $\varepsilon = 0$, we have

$$w \left(c - \sum_1^n x_j \right) = m, \quad \text{from which} \quad x_1 = c(m) - \sum_2^n x_j. \quad (3.3)$$

Substituting (3.3) into (3.2), we shall obtain a $(n-1)$ -dimensional system:

$$\begin{aligned} \dot{x}_2 &= x_2 \left(-m_2 + v_1 \left(c(m) - \sum_2^n x_i \right) - u_2(x_2) x_3 \right), \\ \dot{x}_i &= x_i \left(-m_i + v_{i-1}(x_{i-1}) - u_i(x_i) x_{i+1} \right), \\ i &= 3, \dots, n, \quad x_{n+1} = 0. \end{aligned} \quad (3.4)$$

It is clear that system (3.4) differs from the $(n-1)$ -dimensional system (1.2) only by the shift of indexes $i \rightarrow i+1$, $i=1, \dots, n-1$ and the substitution $c \rightarrow c(m)$. We can show the conditions for system (3.4) at which there exists a non-

degenerate cycle. Since $c(m) - \sum_2^n x_j(t) > 0$ for the cycle $(x_2(t), \dots, x_n(t))$ for

1. The cycle is called nondegenerate if the Poincare mapping corresponding to it does not have an eigenvalue equal to +1.

the period T and $w'(c-c(m)) > 0$, we can apply Anosov's results (1960) according to which, at all small $\varepsilon > 0$, there exists a nondegenerate cycle of system (3.2) lying in R_+^n whose period $T(\varepsilon) \rightarrow T$ at $\varepsilon \rightarrow 0$. Moreover, if system (3.4) has a stable limiting cycle, then system (3.2) has the same property at all small $\varepsilon > 0$.

Thus, unlike Vol'terra's model of closed trophic chains, where it is easy to show the absence of cycles for $n=2$, it is possible to prove the existence of cycles for chains of the length of two and higher by taking into account the saturation factor. In other words, saturation (in combination with the growth of the biomass and death rate [see (2.12), (2.13)]) contributes to the appearance of a soft or a rigid mode of the excitation of autooscillations.

In conclusion, I consider it my pleasant duty to thank Professor Yu. M. Svirezhev for his attention to my work and useful comments.

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UDC 531.3:574.9

REPEATED TELEMESUREMENTS IN DETAILED ANALYSIS OF COMPLEX ECOSYSTEM DYNAMICS

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 277, No 7, Aug 84
(manuscript received 15 Mar 84) pp 1505-1509

VINOGRADOV, B. V., SHVEDE, U. A. and KAPTSOV, A. N., Institute of Evolutionary Morphology and Ecology of Animals imeni A. N. Severtsov, USSR Academy of Sciences, Moscow; Latvian Scientific Research Institute of Agriculture and Agricultural Economics, Skrivere, Latvian SSR

[Abstract] A mathematical analysis was conducted on the forest-swampland-crop field ecosystem in central Latvia on the basis of aerial photographs obtained in the period 1956-1974. The analysis was based on the construction of vectors of the initial and final states of the various components of the ecosystem, as devised by AB Vinogradov [Doklady Akademii Nauk SSSR, 249(3) : 753-756, 1979]. The frequency of spatial changes represents the anthropogenic contribution to the ecosystem and allows for the prediction of trends. On the basis of the analysis, it appears that in the area of interest only 19.8% of the transitions were due to natural successions, whereas 81.8% represented catastrophic and disruptive events of human origin (lumbering, drainage, peat mining, etc.). On the basis of the evident trends it appears that by 1992 hayfields will disappear entirely or account for less than 1% of the land, and that pasture lands, swamps, forests and undergrowth will similarly occupy less than 1% of the area. Tilled fields are expected to decrease by 5.4%, while areas occupied by newly planted woods should increase by 10.8%, and various agricultural constructions should claim 7.8% more of the area. Figure 1; references 4: 2 Russian, 2 Western.
[1526-12172]

SUCCESSION OF OVERGROWTH COMMUNITIES ON SHIP DURING SINGLE NAVIGATION IN PETR VELIKIY BAY

Vladivostok BIOLOGIYA MORYA in Russian No 3, May-Jun 84
(manuscript received 17 Aug 82) pp 22-29

ZVYAGINTSEV, A. Yu., Laboratory of Shelf Communities, Institute of Marine Biology, Far Eastern Scientific Center, USSR Academy of Sciences, Vladivostok 690022.

[Abstract] An attempt is made to analyze the regularities of development of overgrowth communities fouling a working ship during a single navigation season. The development of these communities was observed in Petr Velikiy (Peter the Great) Bay, the ship being examined each fifteen to twenty days. Materials fouling ships of various types at anchor in Zolotoy Rog (Golden Horn) Bay were used to refine the time of settlement of various dominant species. The ship, the Gaydar, was painted with iron minium and launched 26 April 1979. A table lists the thirty-nine species of fouling organisms found on the hull of this ship between 6 May and 27 October 1979. The usual community formed in this bay is *M. edulis*. *Midia* forming continuous populations greatly increase the roughness of the hull and cause a speed loss of 1.5 to 2 knots. There are at present no means for protection of ships from fouling capable of eliminating it completely. The insufficiency of antifouling protection has required development of technological processes for cleaning ships afloat, which are usually used on long distance ships. Coastal service ships, even large ones, often operate without cleaning for two or more seasons. Figures 3; references 17: 14 Russian, 3 Western.
[1516-6508]

ENVIRONMENT

CONCERN OVER BALTIC SEA POLLUTION

Moscow SOVETSKAYA KUL'TURA in Russian 2 Oct 84 p 3

[Article by V. Svirin, special correspondent, Tallinn, "How Is the Sea Feeling?"]

[Text] Whenever a patient entrusted to the staff of the Estonian Academy of Sciences has to be examined, they need to use the vessel, Ayu-Dag.

This is understandable, because their "patient" is the Baltic Sea. Now, Ayu-Dag has departed again, on a routine voyage, its 40th, so that scientists can find an answer to the question: "How is the sea feeling?" The regions of their work will be the central and southern parts of the sea, as well as the Gotland and Bornholm troughs.

This ship made its first such voyage 9 years ago.

"At that time, we determined the level of pollution in the Baltic by heavy metal and organochlorine compounds," we are told by KHARRI YANKOVSKIY, chief of the sector of marine chemistry at the Institute of Thermophysics and Electrophysics. "There are billionths of parts of mercury, copper, zinc, cadmium, lead and pesticides dissolved in the water, and they have the property of accumulating in living organisms. And if we consider the sea-plankton-fish-man chain, the importance of such studies becomes obvious. Plankton, which accumulates toxic agents, is consumed by fish, and the fish reach our table...."

[Question] But through what routes does all this get into the sea?

[Answer] Heavy metals are formed from fuel combustion and are transported through the atmosphere. Even a plant that is very far from shore may be to blame for pollution if it is not equipped with the means of ecological protection. The mercury in sea water is essentially the result of operation of paper and pulp plants. And there is a pattern here: the better the quality of paper produced by an enterprise, the more mercury is released.

[Question] Does this mean that the Baltic is in danger?

[Answer] No. New, improved technologies have been adopted and, as shown by the results of our voyages, the concentration of mercury has even decreased. However, the marine environment must always be monitored so that at the

slightest alarming sign one can offer proper recommendations as to where to direct personnel and means for protection.

It is by no means a simple matter to monitor the condition of such an enormous amount of water. In the last voyage of Ayu-Dag, for example, it traveled 3143 miles and, as the scientists say, treated 142 points in the sea. It did so not only on the surface, but at significant depths. Representatives of the institute's optics sector, who are concerned with methods of remote monitoring of environmental pollution, used laser beams with success. Without stopping the scientific ship to collect samples, they provided good information about plankton and oil film, if any had been discovered.

[Question] Incidentally, speaking of oil. We know that if it gets into the sea, as it spreads it could cover an immense area....

[Answer] Yes, it had been believed that everything spreads uniformly in the sea. But this is not true. In the Baltic Sea, which consists of two layers, one with low and one with high salinity, there are synoptic vortices, topographic and gyroscopic-inertial waves, physical fields, superficial and internal fronts. The temperature of the water, its density, flow velocity and many other factors influence the condition of the Baltic. We have made repeated tests in the same region, and in different parts of the sea, but the concentration of substances was never constant.

[Question] Consequently, the sea is not governed by patterns?

[Answer] That is what we are studying, and we are demonstrating them. A system for protecting the resources of the Baltic has been developed on the basis of our findings; recommendations are being formed on how to control pollution so that the sea would always retain the capacity for self-purification.

Every voyage of the Ayu-Dag means coming closer to revealing new mysteries. Modern equipment, an onboard computer and specialists from other institutes are there to serve the sea. And everything is important here. It is important to know the depth at which life begins, the volume of fish stock and amount of feed for them. It is important to suggest how to build breakwaters so that the tide would not carry sand away from a neighboring beach, where to move silt when erecting the new port in Tallin so that it would not be dumped at sites of traditional spawning. It is important to observe the sea when preparing for important international sailboat competitions....

There are also frequent foreign guests aboard Ayu-Dag on its expeditions. Scientists from Poland, GDR and Sweden have worked in its laboratories. During this voyage, there are plans to discuss, at the Hamburg Institute of Marine Research (FRG), the possibility of joint work in the North and Norway seas, as well as of studying the Bay of Finland with Finnish colleagues and participation in the international meeting in Copenhagen.

Recently, the Estonian Academy of Sciences received a second research ship, the Arnol'd Veymer, outfitted with the newest equipment. It too has become a guardian of the Baltic's purity.

INDUSTRIAL POLLUTION

Moscow MEDITSINSKAYA GAZETA in Russian 21 Sep 84 p 2

[Article by O. Serdyuk, correspondent, under the rubric: "Protection of Nature--The Chain Is No Stronger Than Its Weakest Link"]

[Text] At the end of March of this year the specialists of the health inspection office of Ivano-Frankovsk Oblast carried out a decree to suspend the operation of two production plants at the Kalush Industrial Association "Khlorvinil". The chief of the environmental protection division of the oblast SES [Sanitary and Epidemiological Station] V. V. Mikhno, recalls: "We had to take extreme measures because the association systematically violates the waste water treatment technology for industrial sewage and ignores our instructions."

"Khlorvinil" is a relatively young Association. It is not more than 20 years old. During these years the production capacities have increased almost fifteen-fold, but the provision for waste water treatment facilities has remained almost the same. Specialists of the All Union Association "Soyuzkhlor" are not demanding enough in regard to new plant projects and waste water treatment facilities. As a result, the already existing waste water treatment system is breaking down. For example, this happened with the new polyethylene polyamine shop. Its inadequate, self-contained waste water treatment system affected the work of all the "Khlorvinil" installations. For more than two years now, the persons defending the project are trying to figure out where they went wrong, and meanwhile the nearby rivers are being polluted with the saline waters of "Khlorvinil". Last year in June many fish died due to accidental dumping into the Bolokhivka River.

The waste water treatment facilities are physically old and obsolete, but they are not being rebuilt or modernized. At the enterprise there is waste product storage facility No. 1. It operates constantly under conditions of overloading, and at any moment it may inflict irreversible damage to the Dnestr River basin. It would seem: what is there to think about? A second structure such as this is critically needed. Money for this purpose has been allocated, however, construction has already been proceeding at a snail's pace for several years.

The Industrial Association uses more than 100,000 cubic meters of water daily. And, if we consider that almost all the waste water, having passed (sometimes, purely symbolically) such inadequate degrees of treatment, is dumped into open water basins, it is sad. Where is the caring attitude toward nature and the concern for tomorrow?

What are the USSR Ministry of the Chemical Industry and the All Union Association "Soyuzkhlor" doing to correct this situation? Basically, people have already been saying for many years that it would be good to install a comprehensive basin system at the Association. Such a system would help use water, raw materials and wastes economically and would improve significantly the healthfulness of the environment.

...136 pipes of different heights and diameters tower over "Khlorvinil". The Association, not without a certain pride, declares that only six of these are considered defective. But, there are enough of them to thoroughly pollute the air in the industrial area zone as well as in the residential districts of the city of Kalush.

With the insistence of the oblast Sanitary and Epidemiological Station, just where hasn't the question of the relationship of "Khlorvinil" to the environment been discussed? It has been discussed at the meetings of the Kalush Municipal and Ivano-Frankovsk Oblast Councils of People's Deputies, at the People's Control Committee and at the procurator's office. Rulings have been adopted and sanctions have been applied...However, the administration of "Khlorvinil" does not care at all.

Who cares about the rulings of local bodies? Five years ago the UkSSR State Environmental Protection Committee enacted a special decree regarding the Kalush Association. Specifically, the decree obligated the Association to rebuild the dust and gas scrubber facilities where magnesium and vinyl chloride are produced, and to equip the "KS" dryer furnaces with Venturi pipes. By 1983 "Khloryvinil" was to have organized a stationary post to monitor atmospheric pollution in the residential areas of the city, and to have established even earlier a green zone around the enterprise. Alas! The time periods for implementation of the planned measures have passed, and it turns out that they are only half-furnished.

12525

CSO: 1840/1537

UDC (577.34:574.5) (26)

CONCENTRATION AND ELIMINATION OF I-131 CHEMICALS BY MARINE MACROPHYTES

Kiev GIDROBIOLOGICHESKIY ZHURNAL in Russian Vol 20, No 4, Jul-Aug 84
(manuscript received 20 Sep 83) pp 94-96

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Academy of Sciences, Sevastopol

[Abstract] Studies were conducted on the concentration and elimination kinetics of I-131 iodides and iodates by the brown marine algae *Cystoseira crinita* and the green algae *Ulva rigida* over a six day period, following exposure to I-131 in a concentration of 0.5×10^6 Bq/liter. Activity vs. time plots showed that the rate of iodide accumulation was more efficient than iodate concentration, but that the elimination kinetics for the iodides and iodates was quite similar. The latter indicated that both were converted to similar forms. Reaccumulation of eliminated iodides and iodates followed similar kinetics. These observations indicate that the fate of radioactive pollutants is dependent on their "preprocessing" by marine macrophytes. Figures 4; references 8: 2 Russian, 6 Western.
[1514-12172]

UDC 574.64:594

OIL ACCUMULATION BY MOLLUSKS

Kiev GIDROBIOLOGICHESKIY ZHURNAL in Russian Vol 20, No 4, Jul-Aug 84
(manuscript received 20 Jun 81) pp 63-66

KASYMOV, A. G. and LIKHODEYEVA, N. F., Caspian Biological Station, Institute of Zoology, Azerbaijan SSR Academy of Sciences, Baku

[Abstract] The role of mollusks in oil pollution of the marine environment was investigated with *Mytilaster lineatus* and *Cerastoderma lamarcki* specimens obtained from the Caspian Sea. Exposure of the mollusks to different levels of petroleum obtained from two different oil fields (Sangachaly and Neftyaneye Kamni) showed that both organisms concentrated the oil in their bodies in

quantities directly proportional to the exposure dose and body weight, until toxic levels of exposure were reached. The putative role for *M. lineatus* and *C. lamarcki* may consist of concentration of such hydrocarbons and their eventual transport to sea bottom as part of the marine clearing cycle. References 10: 4 Russian, 6 Western.
[1514-12172]

UDC 614.7]:663.1+631.562+577.151

HYGIENIC ASPECTS OF RESEARCH ON BIOLOGICALLY ACTIVE SUBSTANCES

Moscow GIGIYENA I SANITARIYA in Russian No 3, Mar 84
(manuscript received 26 Sep 83) pp 4-6

SIDORENKO, G. I. and NEMYRYA, Scientific Research Institute of General and Communal Hygiene imeni A. N. Sysin, USSR Academy of Medical Sciences, Moscow

[Abstract] The development of biotechnology and industrial microbiology is expected to increase the production of bioproducts 1.8- to 1.9-fold during the 11th Five Year Plan. Concomitantly, there is increasing concern about the health hazards that such progress may represent, about the methods of evaluating the various products for potential toxicity, and about the implementation of adequate safety measures and other control mechanisms. The public health authorities in the USSR have been charged with the formulation and enforcement of adequate measures to protect the health of the population in general, and of workers in particular, and to minimize, insofar as possible, environmental pollution due to biotechnology. Various monitoring and control techniques have already been developed, and continuing work is being conducted to define the effects of such pollutants on morbidity patterns and to develop effective and enforceable preventive methods.
[1505-12172]

UDC 613.636:664

METHODOLOGY OF PUBLIC HEALTH ASSESSMENT OF BIOLOGICAL POLLUTION

Moscow GIGIYENA I SANITARIYA in Russian No 3, Mar 84
(manuscript received 18 May 83) pp 55-57

AKHUNDOV, V. Yu., SEIDOV, I. M. and FARADZHEVA, S. M., Azerbaijan Scientific Research Institute of Virology, Microbiology and Hygiene imeni G. M. Musabekov, Baku

[Abstract] Studies were conducted on environmental pollution due to industrial microorganisms in the vicinity of a flour milling plant, a brewery, a yeast plant and animal feed plant. The results showed that such plants constitute a real source of pollution of the air and soil in the immediate

surroundings, as well as the plant life, and that the pollutants consisted of both fungal and bacterial agents. A proposed complementary approach to such studies is to maintain experimental animals in the vicinity of such plants to monitor their state of health and immunity, and to conduct clinical follow-ups on children up to 14 years of age residing in similar locations. References 6 (Russian).
[1505-12172]

MYSTERIOUS EEL

Moscow LENINSKOYE ZNAMYA in Russian 19 Aug 84 p 4

SOKOLOV, L., docent, Department of Ichthyology, Biology Faculty, Moscow State University, candidate of biological sciences

[Abstract] Reservoirs around Moscow have been stocked with eels, since the eel is very interesting to sport fishermen. Eels reproduce in the Sargasso Sea, to which they swim following deep ocean currents after 7 to 8 years of life in fresh water rivers and lakes. It is reported that bathysphere observers have seen giant eel larvae almost 2 meters in length. As mature eels these beasts should be almost 30 meters long. It is suggested that these may be the "sea serpents" and "sea monsters" which has been periodically reported. Eels have never yet been successfully reproduced in captivity, but Belorussian scientists have recently induced eels to spawn, though the larvae did not survive.
[839-6508]

UDC: 581.1:577.1

STUDY OF INTERACTION OF MUSSELS WITH OIL POLLUTION

Moscow BIOLOGICHESKIYE NAUKI in Russian No 5, May 84
(manuscript received 26 Apr 83) pp 64-69

MIRONOV, O. G. and SHCHEKATURINA, T. L.

[Abstract] The mussels *Mytilus galloprovincialis* collected in bays in the northwestern Crimea were placed in a bath to which sea water was added daily containing 35.0 mg/l emulsified petroleum. The water was aerated and over a period of 38 days marine fauna samples were taken each day, tissue and excretion products were studied for content of hydrocarbon and lipids. All mollusks survived and attached to each other and to the walls of the bath well. A restructuring of the relationship of the lipid fractions occurred by the end of the experiment. The quantity of triglycerides and fatty acids increased, indicating that fat metabolism was disrupted. Results of studies of mussels collected in water areas naturally contaminated

with the petroleum products shows a variation in carbon chain length of dominant hydrocarbon present in mussels of different sizes. Larger mussels have shorter chain lengths dominant. Smaller mussels also have higher quantities of alkanes per unit mass. (Report recommended by Institute of Biology of the Southern Seas, UkSSR Academy of Sciences). Figures 2; references 13: 9 Russian, 4 Western.
[877-6508]

UDC 616-036.2:616.935(575.4)

UNIQUE FEATURES OF DYSENTERY EPIDEMIOLOGY IN ASHKHABAD OBLAST

Ashkhabad ZDRAVOOKHRANENIYE TURKMENISTANA in Russian No 2, Feb 84 pp 34-35

SOROKIN, O. V., ABUKOVA, Ye. N., DZHANAYEV, K. D. and BERDYMURADOV, M.,
Ashkhabad Oblast Sanitary-Epidemiologic Station

[Abstract] An epidemiologic analysis of dysentery in Ashkhabad Oblast has shown that the highest morbidity prevailed in the period 1966-1974, and that by 1980 the incidence has decreased almost two-fold. Approximately 80% of the cases in the oblast are due to *Shigella flexneri*, 7% to *Sh. sonnei*, 7% to *Sh. boydii*, and 6% to *Sh. newcastle*, although in recent years the contribution of *Sh. flexneri* to the overall morbidity has been diminishing. Approximately 60% of the cases occur in the spring-summer season, and 70-80% of the cases involve children less than 14 years old.
[1503-12172]

UDC: 579.843.1.253

STUDY OF ATYPICAL CHOLERA VIBRIO FORMS

Kiev MIKROBIOLOGICHESKIY ZHURNAL in Russian Vol 45, No 6, Nov-Dec 83
(manuscript received 12 Jan 82) pp 76-80

ANDRUSENKO, I. T., ALEKSANDROVA, I. K., ALEKSEYENKO, V. V. and YERMOLOV, V. I.,
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and Hygiene

[Abstract] A study is presented of the biological properties of subcultures and populations of atypical cholera vibrio strains. The work utilized 98 cultures of so-called O-antigen atypical vibrios which yielded agglutination with cholera sera in low titers, as well as 57 strains of cholera vibrios atypical with respect to 1 or more diagnostic tests. Virulence was determined on young rabbits. At least 100 colonies of each strain were studied. It was found that from 2 to 30% of the cells have typical cholera vibrio properties in the populations of atypical strains. Repeated passage through animal

bodies gives a selective advantage to the typical clones, leading to restoration of specific and generic properties of the strains and an increase in virulence. References 7: 6 Russian, 1 Western.
[806-6508]

UDC: 616.9-022.39-084(571.1/.6)

RESULTS AND PROSPECTS OF FIELD PROPHYLAXIS IN NATURAL PLAGUE FOCI IN CENTRAL ASIA AND KAZAKHSTAN

Moscow ZHURNAL MIKROBIOLOGII EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian
No 6, Jun 84 pp 111-112

AYKIMBAYEV, M. A., AUBAKIROV, S. A., CHEKALIN, V. B. and SEDIN, V. I.,
Alma-Ata

[Abstract] Field disinfection of rodent burrows to exterminate rodents is the most effective single measure taken to reduce the incidence of plague in Central Asia and Kazakhstan. The aviation method of controlling plague carriers such as the great gerbil in the Central Asian natural focus cannot be widely used and requires improvement. It should be used only in primitive areas. Emergency prophylaxis should be performed on the surface, decreasing the consumption of scarce grain. The desire to avoid environmental pollution with pesticides makes the development of methods to decrease chemical pollution increasingly pressing. New less polluting pesticides are currently under development and testing.
[1591-6508]

OPTIMIZATION OF MEASURES TO DECREASE POPULATION OF CARRIERS AND VECTORS IN PLAGUE FOCUS OF CENTRAL ASIAN PLANE

Moscow ZHURNAL MIKROBIOLOGII EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian
No 6, Jun 84 pp 112-114

SOLDATKIN, I. S., KHRULEV, M. V., Saratov

[Abstract] Extermination of rodent carriers of *Yersinia pestis* and the flea vector of the microorganism was studied as a means for decreasing the risk of plague infection in a natural focus. The criterion used to evaluate effectiveness was the extent to which the measures actually performed corresponded to the idealized model. The most nearly optimum method was that of extreme or virtually complete field disinfection performed over small areas by special mobile brigades in order to protect individuals living in specific areas. Processing was performed by small teams immediately around populated points, without attempting to eliminate the rodents and fleas over an entire area.
[1591-6508]

PATHOMORPHOLOGIC CHARACTERISTICS OF EXPERIMENTAL PLAGUE IN PALLAS'S PIKA UPON ALIMENTARY INFECTION

Moscow ZHURNAL MIKROBIOLOGII EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 6, Jun 84 pp 114-115

KOLESNIK, V. S., SAPPO, S. G., MAYEVSKIY, M. P., KALINOVSKIY, A. I. and ASTASHIN, Yu. M., (Irkutsk, Gorno-Altaysk)

[Abstract] Pallas's pikas (Mongolian pishchuks) were infected orally with plague and pathomorphologic investigation of specimens was undertaken. Seventeen pikas were divided into 3 groups, one of which was infected by spraying with a suspension of microbes in the oral cavity, another by administration of the microbial suspension into the stomach, the last group by smearing ground infected fleas into the oral cavity. Regardless of the method of infection, post-mortem examination of the animals revealed basically monotypical pathologic changes. The alimentary infections are clear manifestations of generalized plague with primary damage to submaxillary and paratracheal lymph nodes.

[1591-6508]

CHARACTERISTICS OF EXPERIMENTAL PLAGUE IN WHITE RATS POISONED WITH ANTICOAGULANTS

Moscow ZHURNAL MIKROBIOLOGII EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 6, Jun 84 pp 115-116

BORISOV, I. V. and POPOV, V. A., Stavropol'

[Abstract] Anticoagulants have been widely used in the control of synanthropic rodents. To determine the pathogen effect of anticoagulants, experiments were conducted on 164 white rats, fed daily doses of 0,375 mg/kg zoocumarine or ratindane, after which the rodents were infected subcutaneously with a virulent strain of *Yersinia pestis*. The animals were sacrificed and examined 1, 2, 3, 4, 5 and 6 days after infection by the usual methods. The anticoagulants were found to facilitate earlier development of the infectious process, greatly increasing their infection sensitivity. The pathomorphologic changes apparently resulted from the combined influence of the anticoagulants and pathogenic factors of the plague microbe. Broader utilization of anticoagulants in natural plague foci is recommended.

[1591-6508]

CONGENITAL AND HEREDITARY NEPHROPATHIES AMONG CHILDREN ACCORDING TO
EPIDEMIOLOGIC INVESTIGATION DATA

Moscow VESTNIK AKADEMII MEDITSINSKIKH NAUK SSSR in Russian No 7, Jul 84
(manuscript received 7 Sep 83) pp 82-88

IGNATOVA, M. S., FOKEYEVA, V. V., KALININA, A. A., VEL'TISHCHEV, Yu. Ye.,
Moscow, SHULER, D. (Budapest), LUVSANDAGVA, E. (Ulan-Bator) and KLUKA, V.
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[Abstract] This work summarizes the results of epidemiologic study of
nephropathies in children living in the socialist block including studies
performed in 13 regions of the RSFSR from Leningrad to Vladivostok, in
Hungary, Czechoslovakia and Mongolia. Congenital nephropathy was understood
to mean pathology which exists upon birth of the infant regardless of when it
might be discovered. Hereditary disease of the kidneys may be monogenic of
polygenic, and not all genetically-determined nephropathies are congenital
in the clinical sense. Uro- and nephropathies related to chromosomal disease
represent a special group. The study of hereditary and congenital diseases
of the organs of the urinary system has revealed a number of peculiarities
with various gene funds, climatogeographic and social-economic conditions.
They are manifested primarily in heterogeneity of hereditary and congenital
nephropathies and an increase in their frequency in comparison with acquired
kidney disease and disease of the urinary tract organs. Various versions
of hereditary and congenital nephropathies predominate in different regions.
Common in all areas was a tendency of the pathology to progress and frequent
development of renal insufficiency even in childhood. Selective screening
by widespread urinalysis with subsequent followup of families in which
variations are found has been shown to be a useful method for determining
hereditary and congenital nephropathies. References 32: 20 Russian,
12 Western.
[1623-6508]

POSSIBILITY OF ESTIMATING INTENSITY OF LABOR IN MASS EPIDEMIOLOGIC STUDIES

Moscow GIGIYENA TRUDA I PROFESSIONAL'NYYE ZABOLEVANIYA in Russian No 7,
Jul 84 (manuscript received 13 Sep 83) pp 41-43

VERMEL', A. Ye., GASANYAN, G. A. and ANAN'YEV, B. V., Institute of Labor
Hygiene and Occupational Diseases, USSR Academy of Medical Sciences, Moscow

[Abstract] Previous studies of the epidemiology of hypertension and heart
disease have largely ignored the role of the labor process in the formation
and development of these diseases. A questionnaire is suggested for estimat-
ing the degree of nervous and emotional stress of labor. It includes questions

for the number of hours worked per day, the nature of the labor process, duration of concentrated attention and number of production objects which must be simultaneously observed. It was found that it is possible in principle to evaluate labor tension, although workers frequently give incorrect answers, not confirmed by observation when presented with the questionnaire. The questions on working conditions, nature of the labor process and number of objects simultaneously observed are considered most useful in evaluating the stress of a working situation. References 7 (Russian). [1626-6508]

UDC: 616-036.2:616,935(575.4)

EPIDEMIOLOGY OF DYSENTERY IN ASHKHABAD OBLAST

Ashkhabad ZDRAVOOKHRANENIYE TURKMENISTANA in Russian No 12, Dec 83 pp 22-23

SOROKIN, O. V., ABUKOVA, Ye. N., DZHANAYEV, K. D. and BERDYMURADOV, M.,
Ashkhabad Oblast Sanitary-Epidemiologic Station (Chief Physician Ye. N. Abukova)

[Abstract] A study is reported of the dynamics and level of morbidity, as well as certain specifics of the epidemic process of intestinal infections in Ashkhabad Oblast. The percentage of intestinal infections in total infectious morbidity is gradually increasing in the area. In 1975, intestinal infections, including dysentery, represented 20% of all infectious disease excluding influenza and acute respiratory disease, in 1978--37%, in 1980--55%. Dysentery morbidity was highest from 1966 through 1974, decreasing in recent years. Morbidity varies among the rayons of the oblast by a factor of 2 to 5. Dysentery is most common in spring and summer, up to 60% of all cases occurring between May and July. Children up to fourteen years, particularly children up to three years, are most heavily affected. [1611-6508]

UDC: 616.36-002-022:578.891]:061.3(47+57) 1983

SYMPOSIUM ON VIRAL HEPATITIS

Moscow VOPROSY VIRUSOLOGII in Russian Vol 29, No 4, Jul-Aug 84 pp 510-511

PRITYMYAGI, L. S. and REYNARU, I. K., Tallin

[Abstract] A symposium was held, 29-30 Sep '83 in Tallin on the problem of epidemiology, specific laboratory diagnosis and prophylaxis of viral hepatitis. Also convened at this time was an expanded session of the All-Union Problem Commission 'Viral Hepatitis.' The organizers of this symposium were the Tallin Scientific Institute of Epidemiology, Microbiology and Hygiene, Estonian Ministry of Health, the Institute of Virology imeni D. I. Ivanovskiy,

USSR Academy of Medical Sciences and the Estonian Republic Scientific Society of Epidemiologists, Microbiologists and Infectious Disease Experts imeni I. I. Mechnikov. The symposium involved 133 specialists, 36 from Moscow, Leningrad, Vil'nyus, Riga, Kiev, Kishinev, Gor'kiy, Alma-Ata, Voronezh, Tbilisi and L'vov. Among the participants were 40 scientific workers, including 17 doctors of medical science and 12 candidates of medical science. The report of I. K. Reynaru (Tallin) presented comparative data on the morbidity of viral hepatitis of various types in the Estonian SSR and other union republics. R. Kh. Yafayev (Leningrad) reported on an increase in morbidity in 1979 in Leningrad Oblast, as well as the Baltic Republics, which coincided with cessation of the use of gamma globulin for preventive purposes. R. V. Belozerova (Riga) presented materials indicating that outbreaks with water and food paths of transmission of the infection are significant among epidemic outbreaks of hepatitis A in Latvia. A. A. Kompaniyets (Moscow) reported on the results of studies on the immunostructure of the population against the hepatitis A virus in Tallin and Alma-Ata. It was shown that in both cities there is a regular increase in the number of persons with antibodies to this virus with increasing age. It was emphasized at the symposium that scientific workers in recent years have achieved great successes in studying the epidemiology and diagnosis of various forms of viral hepatitis. More sensitive and specific laboratory methods are being used in the practice of public health. The prerequisites are on hand for successful future utilization of antihepatitis B vaccines.
[1601-6508]

UDC: 615.371:578,835.15].015.46.07-053.2

STUDY OF HUMORAL ANTIPOLIOMYELITIS IMMUNITY IN CHILDREN INOCULATED WITH LIVE POLIOMYELITIS VACCINE

Moscow VOPROSY VIRUSOLOGII in Russian Vol 29, No 2, Mar-Apr 84
(manuscript received 18 Oct 82) pp 251-253

KAPLAN, A. S., VASILEVSKAYA, N. I. and KOZHEVNIKOV, I. N., Leningrad City Sanitary-Epidemiologic Station

[Abstract] Materials are presented from studies performed between 1973 and 1980 on humoral antipoliomyelitis immunity among children inoculated with live polio vaccine. It was found that good immunity was achieved for all types of poliomyelitis viruses. The greatest percent of children (97.2-99.6) had immunity to type II polio virus, immunity to type III being achieved in 83.5-91.4% of cases. Differences were also found in the geometric mean antibody titer, 20.6-34.0 for type II and 7.0-13.0 for type III. Studies over several years showed that inoculating children with live polio vaccines maintains good immunity over a period of years. References 7 (Russian).
[1531-6508]

CLINICAL-EPIDEMIOLOGIC DESCRIPTION OF MALARIA IN MINSK, 1967-1982

Minsk ZDRAVOOKHRANENIYE BELORUSSII in Russian No 6, Jun 84
(manuscript received 31 Aug 83) pp 17-20

KARAPETYAN, R. G., NOVIKOV, P. L., ZUBRITSKIY, P. K. and LINNIKOVA, G. D.,
Department of Infectious Diseases (headed by Professor P. L. Novikov),
Minsk Medical Institute; Minsk City Infectious Disease Clinical Hospital
(Chief Physician V. A. Podoved)

[Abstract] Malaria morbidity in Minsk over the past 15 years is described. 35 patients were treated at the Minsk city infectious disease clinical hospital between 1967 and 1982, 22 had been diagnosed as having malaria, 13 had not. In 25 cases the patients had arrived in the USSR in the past 30 days, in 5 cases--in the past 3 months, in 5 cases--in the past 9 months, 9 cases were recurrences. All 11 persons with tropical malaria had arrived from Africa. Characteristics of the disease and a case history are presented. The clinical picture of malaria was found to feature all of the main points of the classical disease. Combined treatment was effective in all cases. No cases of resistance to delagil were observed. However, pyrimethamine and one of the sulfanilamides should be used as well. Polyclinic physicians were found to be insufficiently aware of the possibility of malaria in making their diagnoses. References 34: 25 Russian, 9 Western.
[866-6508]

UDC 612.398:634.836]-06:611-013

BIOLOGICAL ASSESSMENT OF GRAPE SEED PROTEIN

Moscow GIGIYENA I SANITARIYA in Russian No 3, Mar 84
(manuscript received 12 Apr 83) pp 24-26

GRIGORASHVILI, G. Z., Scientific Research Institute of Sanitation and Hygiene imeni G. M. Natadze, Georgian SSR Ministry of Health, Tbilisi

[Abstract] Male and female outbred rats were used to assess the safety of grape seed protein concentrate in feeding studies of variable duration. The physiological studies revealed that the relative biological effectiveness of an 18% concentrate was 70.6% in terms of casein. Furthermore, the biochemical and histologic studies showed the grape seed was entirely safe for the species in question under the conditions employed. There were no embryotoxic effects, and only moderate cytochemical changes in neutrophils (elevated glycogen concentration and increased peroxidase activity). References 10: 9 Russian, 1 Western.

[1505-12172]

GENE SEDUCTION: IN VIVO YEAST GENE CLONING AND TRANSFER VIA AUTONOMOUS
REPLICATING FACTORS

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 277, No 6, Aug 84
(manuscript received 20 Feb 84) pp 1472-1475

BULAT, S. A., PESHEKHONOV, V. T., CHEPURNAYA, O. V. and ZAKHAROV, I. A.,
Leningrad Institute of Nuclear Physics imeni B. P. Konstantinov, USSR
Academy of Sciences, Gatchina, Leningrad Oblast

[Abstract] Hybrid strains of *Saccharomyces cerevisiae* were employed for in vivo gene cloning and gene transfer studies, using standard methods of genetic analysis and transformation. Plasmid pYF91, containing a large fragment of yeast chromosome III with the LEU2 gene and part of TUL-17 transposon can, as a consequence of TUL-17, integrate not only in homologous leu2 locus of chromosome III, but also at other genome sites. As a result, a recombinant subclone was isolated in which the plasmid was integrated in chromosome I at a site closely linked to the ade1 locus. Such recombinants were unstable and yielded a plasmid (pSBI-22A) containing the ADE1 gene from chromosome I. Integration of pSBI-22A into chromosome III, apparently at the site of the leu2 locus, resulted in the introduction of the ADE1 gene into chromosome III. The entire process has been accorded the designation 'gene seduction', in analogy to sexduction in bacterial systems. Figure 1; references 10: 4 Russian, 6 Western.
[1526-12172]

FREQUENCY OF X-CHROMOSOME NONDISJUNCTIONS IN FEMALE DROSOPHILA MELANOGASTER EXPOSED TO ORBITAL FLIGHT

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 277, No 6, Aug 84
(manuscript received 19 Mar 84) pp 1479-1481

FILATOVA, L. P., VAULINA, E. N. and GROZDOVA, T. Ya., Institute of General Genetics imeni I. I. Vavilov, USSR Academy of Sciences, Moscow

[Abstract] The frequency of chromosomal nondisjunction in relation to orbital flight aboard Salyut 6 was studied in female *Drosophila melanogaster* fruit flies. The females were homozygous for gene Y on chromosome X and heterozygous for genes b, pr, cn and en on chromosome-2. In comparison with control data, showing a frequency of nondisjunction of $0.015 \pm 0.006\%$, the figures for the experimental flies were twice as great ($0.034 \pm 0.0100\%$). Since the increase in nondisjunction was unrelated to the duration of space flight, the effects were attributed to bombardment by heavy cosmic ions.

References 15: 6 Russian, 9 Western.

[1526-12172]

UDC: 576:312.36/470.23

STUDY OF DISTRIBUTION OF SISTER CHROMATID EXCHANGES AMONG RESIDENTS OF LENINGRAD

Kiev TSITOLOGIYA I GENETIKA in Russian Vol 18, No 4, Jul-Aug 84
(manuscript received 11 Feb 83) pp 302-307

SLOZINA, N. M., BOROVITSKAYA, Ye. E. and GOLOVACHEV, G. D., Scientific Research Institute of Obstetrics and Gynecology, USSR Academy of Medical Sciences, Leningrad

[Abstract] A study is presented of the specifics of variation of the frequency of sister chromatid exchanges (SCE) in a group of healthy residents of Leningrad with no occupational hazards. Healthy individuals 17 to 50 years of age (average age 26.4) with no occupational harmful factors known influencing intra-chromosomal processes were examined. The micromethod of culturing peripheral blood lymphocytes was used. The total number of exchanges was determined in no less than 25 metaphases for observation. The mean value of SCE per cell and median value error were calculated. The frequency of SCE in the group was characterized by the weighted optimal level determined based on the arithmetic mean values of SCE frequency considering the error in the mean values. Normal distribution of mean SCE frequency in individuals was found. No relationship was determined between SCE frequency and sex, age or smoking (up to 10 cigarettes per day). A systematic statistically significant fluctuation in SCE frequency was found for nonsimultaneous measurements. Individual differences were observed in the dispersions of mean

values upon repeated examinations. The results indicate that SCE is a characteristic with a broad reaction range. Figure 1; references 15: 4 Russian, 11 Western.
[852-6508]

UDC: 362.123:612.6.05

PRINCIPLES OF REGIONAL MEDICAL-GENETIC CONSULTATION

Moscow VESTNIK AKADEMII MEDITSINSKIKH NAUK SSSR in Russian No 7, Jul 84
(manuscript received 7 Sep 83) pp 88-91

KOZLOVA, S. I., Institute of Medical Genetics, USSR Academy of Medical Sciences, Moscow

[Abstract] The regional approach to medical-genetic consultation is concerned both with problems of organization and with methods of consultation, particularly calculation of genetic risk. The major organizational question is the demand for this type of consultation in a given area. Unfortunately, at present we do not have complete data on the magnitude and nature of genetic load and characteristics of the structure of the populations of the Soviet Union. From the standpoint of the regional approach to medical-genetic consultation it is important to consider all major factors which influence the genetic structure of a population: inbreeding, migration, gene drift, mutation and selection. Each of these factors is briefly explained. They influence the geographic specifics of variation of the hereditary pathology load on a population. When a full description of a population is available, including specifics of the prevalence of the hereditary disease, demographic, ethnic, and other information, it will be possible to provide adequate planning for the organization of health to families with hereditary pathology. Figure 1; references 13: 8 Russian, 5 Western.
[1623-6508]

UDC: 616-055.5/.7-036.2

GEOGRAPHIC PATHOLOGY AND CERTAIN PROBLEMS OF MEDICAL GENETICS

Moscow VESTNIK AKADEMII MEDITSINSKIKH NAUK SSSR in Russian No 7, Jul 84
(manuscript received 7 Sep 83) pp 6-10

AVTSYN, A. P., MARACHEV, A. G., ZHAVORONKOV, A. A., Institute of Human Morphology, USSR Academy of Sciences, Moscow

[Abstract] Geographic pathology is a discipline which studies human, animal and plant pathology in relationship to geographic factors. The stages of a study of geographic pathology include analysis of climatogeographic and social-economic conditions of a region, analysis of the structure of morbidity and mortality of the population in the geographic

region, study of the states and reactions of adaptation of man and animals to local conditions, determination and recording of the extent of endemic, hereditary and nonhereditary local human diseases, modeling of pathologic processes, development of theoretical and practical problems of geographic pathology. Studies on the adaptive regulation of the functioning of human erythrocytes in various geographic regions of the USSR have indicated that climatogeographic conditions are among the most important factors in the selection of hereditary anomalies in hemoglobin and erythrocyte enzymes. This is particularly true in the extreme north and in high mountain regions of the southern USSR. Figure 1; references 19: 17 Russian, 2 Western.
[1623-6508]

UDC: 612.6.07:614.1

DYNAMICS OF POPULATION STRUCTURE PARAMETERS AS RESULT OF SOCIAL-DEMOGRAPHIC CHANGES

Moscow VESTNIK AKADEMII MEDITSINSKIKH NAUK SSSR in Russian No 7, Jul 84
(manuscript received 7 Sep 83) pp 21-26

REVAZOV, A. A., Institute of Medical Genetics, USSR Academy of Medical Sciences, Moscow

[Abstract] Requirements for human population biology are formulated: populations must be genetically varied and not overloaded with genes which decrease the social capabilities of its members. This work studies the dynamics of the primary population-genetic characteristics in the process of social-economic development. It is intended to estimate the local dynamics of inbreeding and migrations of Russian and Asiatic rural populations, to develop new and adapt existing approaches for direct estimation of the dynamics of natural selection and obtain data on these dynamics. The role of family planning and the behavior of the genetic component of dispersion of fecundity in the dynamics of natural selection is estimated. Studies were based on data on the Arkhangelsk and Kostroma rural populations as well as the populations of small cities in Kostroma oblast, rural populations of Uzbekistan and Turkmenia. Reduced natural selection due to an improvement in living conditions is not found to contribute to deterioration of the gene pool, since the selection structure also changes. References 11: 6 Russian, 5 Western.
[1623-6508]

STATUS AND PROSPECTS FOR DEVELOPMENT OF RESEARCH ON GENOGEOGRAPHY OF
HEREDITARY APHTHOLOGY IN USSR

Moscow VESTNIK AKADEMII MEDITSINSKIKH NAUK SSSR in Russian No 7, Jul 84
(manuscript received 7 Sep 83) pp 26-31

GINTER, Ye. K., Institute of Medical Genetics, USSR Academy of Medical
Sciences, Moscow

[Abstract] Population geography of hereditary diseases is a part of medical genetics which studies the specific propagation of hereditary pathology in human populations as a function of demographic, ethnic and other population characteristics as well as differences in the environment. Accumulation and systematization of data on the spread of hereditary diseases is of great practical significance due to the constant growth of the influence of hereditary pathology on morbidity and mortality. Primary attention in these studies must be given to the scale of genetic variability. It is possible in principle to analyze the significance of individual population dynamics factors in the formation of differences between populations of various hierarchical levels, ethnic origin, occupying territory differing in environmental characteristics. There are hereditary diseases which are inherited in different ways and with different frequencies of transmission. It is found that the status of equilibrium between the pressure of mutations and the pressure of selection for a number of genes is approximately at the same level in different populations. The approach selected here can be used to reveal the effects of selection with respect to other hereditary diseases encountered in populations with a given frequency, more particularly when differentiation in population is observed at a rather high hierarchical level. Figure 1; references 16: 12 Russian, 4 Western.
[1623-6508]

GENOGEOGRAPHY OF HEREDITARY METABOLIC DISEASES IN USSR

Moscow VESTNIK AKADEMII MEDITSINSKIKH NAUK SSSR in Russian No 7, Jul 84
(manuscript received 7 Sep 83) pp 38-44

KRASNOPOL'SKAYA, K. D., Institute of Medical Genetics, USSR Academy of
Medical Sciences, Moscow

[Abstract] Problems of genogeography of hereditary metabolic diseases in the USSR include three aspects: who shall perform the studies, what medical approaches shall be used, what are the results desired? A brief review of studies of hereditary metabolic diseases, including PKU, currently underway in the USSR is presented. It is noted that biochemical diagnosis of hereditary

metabolic diseases began in the USSR only about 10 years ago and is developing rather slowly as a result of great shortages of materials and personnel. However, the establishment of regional peculiarities in the distribution of the frequency and spectrum of hereditary metabolic diseases has yielded sufficient material for prediction of morbidity of the population in various regions, tracing of the dynamics of mutant genes in the future and planning of public health measures for determination, treatment and prevention of the spread of individual hereditary metabolic diseases in many regions. References 12: 8 Russian, 4 Western. [1623-6508]

UDC: 616,155,1-055,5/.7-036,2

POPULATION GEOGRAPHY OF IMPORTANT HEREDITARY ERYTHROCYTOPATHIES

Moscow VESTNIK AKADEMII MEDITSINSKIKH NAUK SSSR in Russian No 7, Jul 84 (manuscript received 7 Sep 83) pp 44-48

TOKAREV, Yu. N., Central Scientific Research Institute of Hematology and Blood Transfusion, USSR Ministry of Health, Moscow

[Abstract] A classification of the most important hereditary erythrocytopathies is presented, reflecting current concepts of their etiology, pathogenesis, structural and functional specifics of the erythrocytes and the regulation of their production. Diseases include hereditary anemias, methemoglobinemia and erythrocytoses. Methods of diagnosis, prevention and treatment of these erythrocytopathies are noted. The study of the distribution of hematologic diseases in various populations as a function of geographic conditions is proceeding in the USSR. According to massive population studies involving over 65,000 subjects, G-6-FDG deficiency anemia is most frequent in former malaria regions of central Asia and the Transcaucasus, particularly Azerbaijan. The fact of extreme frequency of this anemia among certain ethnic groups in central Asia and the Transcaucasus is apparently explained by determination of malaria infection as a selection factor and endogamy, particularly in isolates. References 15: 13 Russian, 2 Western. [1623-6508]

UDC: 616.155.1-008.931:577.152.271

DISTRIBUTION OF ERYTHROCYTE ENZYMOPATHIES (PYRUVATE KINASE, GLUCOSE PHOSPHATE ISOMERASE, GLUTATHIONE PEROXIDASE AND GLUTATHIONE REDUCTASE) IN POPULATION OF AZERBAIJAN

Moscow VESTNIK AKADEMII MEDITSINSKIKH NAUK SSSR in Russian No 7, Jul 84
(manuscript received 7 Sep 83) pp 48-51

MOVSUN-ZADE, K. M., RASULOV, E. M. and TSALIKOVA, T. P., Institute of Physics, Azerbaijan Academy of Sciences, Baku

[Abstract] A study was made of the prevalence of hereditary pyruvate kinase, glucose phosphate isomerase, glutathione peroxidase and glutathione reductase insufficiency in the erythrocytes in the population of Azerbaijan. Enzyme activity was studied in phenotypically-healthy adults and children. The frequency of mutant enzymes among school children was distributed nonuniformly. No differentiation in frequency of mutant phenotypes of the enzymes was observed within rayons. References 14 (Russian).
[1623-6508]

UDC: 616.155.194.125-092

STUDY OF GENO GEOGRAPHY OF β -THALASSEMIA IN 'MALARIA HYPOTHESIS' ASPECT

Moscow VESTNIK AKADEMII MEDITSINSKIKH NAUK SSSR in Russian No 7, Jul 84
(manuscript received 7 Sep 83) pp 51-53

MESTIASHVILI, I. G., Institute of Hematology and Blood Transfusion, Georgian SSR Ministry of Health, Tbilisi

[Abstract] The purpose of this work was to use the Georgian SSR to determine the significance of malaria as a selection factor in the transmission of the β -thalassemia gene. Population studies were performed in 3 directions: 1) a study of the transmission of β -thalassemia in malaria zones; 2) a study of the distribution of gene frequencies in former malaria foci; and 3) a comparison of the β -thalassemia prevalence index with the parasitic malaria picture in the past. Some 11,428 practically healthy persons were examined in 1969-1978 using a rapid diagnostic method developed by the author for detection of β -thalassemia. A direct correlation was found between the malarigenicity of the territory and the frequency of the gene, indicating the selective role of malaria. This conclusion was tested by predicting the frequency of the β -thalassemia gene in regions of the republic not previously studied where the malarigenicity and ethnic composition of the population were known. The direct correlation was found between intensity of malaria in foci and frequency of the β -thalassemia gene. Analysis of the data shows coincidence of the areas of β -thalassemia and malaria caused by *P. vivax*, indicating the selective role of this very parasite. References 6 (Russian).
[1623-6508]

MOLECULAR-GENETIC VARIANTS OF THALASSEMIA

Moscow VESTNIK AKADEMII MEDITSINSKIKH NAUK SSSR in Russian No 7, Jul 84
(manuscript received 7 Sep 83) pp 54-58

SHIPITSYNA, G. I., DERGUNOVA, L. V., MAZUROVA, O. L., SLOMINSKIY, P. A.,
MALEYEVA, N. Ye. and LIMBORSKAYA, S. A., Institute of Medical Genetics,
USSR Academy of Medical Sciences; Institute of Molecular Biology, USSR
Academy of Sciences, Moscow

[Abstract] This work presents a molecular-genetic characterization of β - and α -thalassemia in the territory of USSR, specifically the Transcaucasus, central Asia and the European USSR. The molecular-genetic study of α -thalassemia among patients of various nationalities in USSR revealed halotypes not containing α -globin genes and with one α -globin gene, possibly indicating the spread of these heredity defects in these populations. In patients with hemoglobinopathy H a combination of these haplotypes was observed, characteristic for Asiatic type hemoglobinopathy H. In contrast to β -thalassemia, α -thalassemia is thus based on large deletions in the α -globin gene system. In patients with β -thalassemia the amount of inhibition of β -globin synthesis varied as did the content of β -globin mRNA. No great defects in the β -globin gene structure were observed. References 19: 5 Russian, 14 Western.
[1623-6508]

SPECIFICS OF PROPAGATION OF CONGENITAL DEVELOPMENTAL DEFECTS IN BELORUSSIA

Moscow VESTNIK AKADEMII MEDITSINSKIKH NAUK SSSR in Russian No 7, Jul 84
(manuscript received 7 Sep 83) pp 58-61

LAZYUK, G. I., LUR'YE, I. V., USOVA, Yu. I. and NIKOLAYEV, D. L., Branch,
Institute of Medical Genetics, USSR Academy of Medical Sciences, Minsk

[Abstract] There are two systems for accounting for congenital developmental defects in Belorussia. The first is intended for estimation of the intensity of the mutation process (genetic monitoring). The second is designed to estimate the frequency and structure of all forms of such defects in children during the first year of life. The monitoring system has been in operation since 1979, the system for accounting for all defects in individual areas since 1978. No significant differences in overall frequencies of congenital developmental defects have been found among years since the reported systems were begun or among areas in the Republic. The frequencies of anencephaly and spina bifida, cleft palate, polydactyly and isolated atresias are noted to be the same as those reported by other authors for other areas. The overall frequency of congenital development anomalies in children under one year of age is 27.2 per 1000 births. There has been some decrease in recent years

in the frequency of Downs Syndrome, probably a result of the decrease in mean age of mothers giving birth. References 12: 8 Russian, 4 Western.
[1623-6508]

UDC: 616-055.5/.7-036.2

REGIONAL SPECIFICS OF PREVELANCE OF HEREDITARY PATHOLOGY IN TURKMENIA

Moscow VESTNIK AKADEMII MEDITSINSKIKH NAUK SSSR in Russian No 7, Jul 84
(manuscript received 7 Sep 83) pp 61-66

TURAYEVA, Sh. M., Institute of Medical Genetics, USSR Academy of Medical Sciences, Moscow; Institute for Preservation of the Health of Mothers and Children, Turkmenian SSR Ministry of Health, Ashkhabad

[Abstract] The author examined a number of Turkmenian tribes, finding 24 nosologic forms of hereditary pathology in 69 families. Five of these are autosomal dominant, 16 autosomal recessive, 3 x-linked. The studies in general reveal moderate local accumulation of individual forms of hereditary pathology resulting from the subdivision of the population into individual tribes in which the genetic drift effect is manifested to varying degrees. The genetic drift results from the division of the population into two hierarchical levels (nation and individual tribes) and the great degree of isolation of the tribes. References 5 (Russian).
[1623-6508]

UDC: 616-055.5/.7-036.2(575.3)

REGIONAL SPECIFICS OF PREVELANCE OF HEREDITARY PATHOLOGY IN TAJIKISTAN

Moscow VESTNIK AKADEMII MEDITSINSKIKH NAUK SSSR in Russian No 7, Jul 84
(manuscript received 7 Sep 83) pp 67-69

PILOSOV, R. A. and MIRZOYEVA, Z. A., Institute for Protection of Mothers and Children, TaSSR Ministry of Health, Dushanbe

[Abstract] A study was performed of the prevalence of hereditary disease among rural residents of the Tajik SSR with simultaneous description of factors of population dynamics influencing the distribution and spectrum of hereditary pathologies in this contingent. A study was performed in Gissarskiy rayon, one of the largest regions in the SSR inhabited primarily by Tajiks and Uzbeks. At least 9 nosologic forms of hereditary states were found in 2 families or more. Autosomal-dominant hereditary pathology was found in 0.39/1000, autosomal-recessive pathologies 1.19/1000 of population. No significant differences were observed in the frequencies of either type among ethnic groups in the area. Since other studies elsewhere in the USSR indicate that the geographic variation of the frequencies of these pathologies may be great, the authors call for studies in other areas in that republic. References 9: 8 Russian, 1 Western.
[1623-6508]

REGIONAL SPECIFICS OF PREVELANCE OF HEREDITARY PATHOLOGY IN UZBEKISTAN

Moscow VESTNIK AKADEMII MEDITSINSKIKH NAUK SSSR in Russian No 7, Jul 84
(manuscript received 7 Sep 83) pp 69-75

GAR'KAVTSEVA, R. F., GINTER, Ye. K. and REVAZOV, A. A., All-Union
Oncologic Scientific Center, USSR Academy of Medical Sciences; Institute of
Medical Genetics, USSR Academy of Medical Sciences, Moscow

[Abstract] Staff personnel of the Institute of Medical Genetics in cooperation with many specialists of other institutes have undertaken medical-genetic studies in several regions of Uzbekistan. This report presents results of a study of hereditary disease, the spectrum of hereditary pathology and the relationship of these medical-genetic characteristics of the population of Uzbekistan with its population structure. The study was performed primarily in Urgut rayon, Samarkand Oblast. The major results of the study of the population structure is discovery of a high coefficient of inbreeding in combination with a significant level of migration among oases, relatively low standardized dispersion of gene frequencies and low genetic divergence of the population. The contradictory nature of these results was explained by marriage traditions. β -Thalassemia, abnormal hemaglobin D and hereditary disease syndromes were relatively frequent, which agrees with the high level of inbreeding. References 10: 8 Russian, 2 Western.
[1623-6508]

STUDY OF PREVELANCE OF HEREDITARY DISEASE IN WESTERN SIBERIA

Moscow VESTNIK AKADEMII MEDITSINSKIKH NAUK SSSR in Russian No 7, Jul 84
(manuscript received 7 Sep 83) pp 76-78

PUZYREV, V. P., Tomsk Department of Institute of Medical Genetics, USSR
Academy of Medical Sciences; Siberian Branch, All-Union Oncologic Scientific
Center, USSR Academy of Medical Sciences, Tomsk

[Abstract] The author's group has begun a medical-genetic study of the Khants living in western Siberia and numbering 21,000 persons. These people of northern Siberia in a number of alleles. A summary approach was used to estimate the load of hereditary disease in the Khant population. The results of the study indicate that it is necessary to combine genetic studies and overall epidemiologic genetic studies. Most studies to date in this area are simple summarizations of the results of area medical genetic offices or specialized clinics. The data from these studies cannot be used without adjustment to fit the entire population. A deeper study of regional specifics of the prevalence of hereditary pathology is a necessary prerequisite for the development of many theoretical and applied problems and aspects of human and medical genetics. References 16: 15 Russian, 1 Western.
[1623-6508]

MEDICAL-GENETIC AND POPULATION CHARACTERISTICS OF NATIVE RESIDENTS OF MOUNTAINS OF ALTAY

Moscow VESTNIK AKADEMII MEDITSINSKIKH NAUK SSSR in Russian No 7, Jul 84
(manuscript received 7 Sep 83) pp 78-81

LOTOSH, Ye. A., KOLBASKO, A. V., DRANISHNIKOV, A. K. and LUZINA, F. A.,
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[Abstract] The mountains of Altay are a natural model for the study of various aspects of human biology and pathology. An expedition of the authors' institute studied in 1979-1982 the native population of the mountains of Altay, collecting population-demographic data, studying genetic polymorphism, recording anthropometric and anthroposcopic data, evaluating various ecologic factors and studying the epidemiology of hereditary and multifactorial diseases. Comprehensive examination was performed of persons with and without hereditary pathology in 20 villages in Altay. 97 Villages were examined for population-demographic characteristics and 40 as a part of the anthropogenic program. The results indicate a high frequency of hereditary pathology in general, particularly autosomal-dominant diseases. Apparently during the process of inbreeding many hereditary diseases have been eliminated from the population. The high level of inbreeding maintains hereditary pathology at a certain level in spite of this. References 7 (Russian),
[1623-6508]

UDC: 581.143.5:581.174

PRODUCTION, REGENERATION AND FUSION OF TRICHODERMA REESEI PROTOPLASTS

Moscow GENETIKA in Russian Vol 20, No 8, Aug 84
(manuscript received 9 Sep 83) pp 1387-1389

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[Abstract] The task of this work was to determine optimal conditions for isolation and regeneration of *T. reesei* protoplasts, and to achieve fusion of labeled mutant protoplasts to determine the possibility of producing heterokaryons as a basis for further genetic research. The mycelia were cultured in liquid glucose for 18 hours, treated with 2-mercaptoethanol or dithiotreitol for 15 to 20 minutes with sodium chloride or mannitol used as stabilizers during incubation and regeneration. Protoplasts were regenerated directly on agarized media. The procedures developed had no influence on the initial characteristics of the culture such as color of the colonies, morphology of colonies, nutrient demand or frequency of reversions to prototrophism among auxotrophic mutants. Figure 1; references 5: 1 Russian, 4 Western,
[1618-6508]

UDC: 575.1:633.11,582,285.1

GENETIC ANALYSIS OF RESISTANCE OF SPRING WHEAT TO LOOSE SMUT

Moscow GENETIKA in Russian Vol 20, No 8, Aug 84
(manuscript received 19 Sep 83) pp 1337-1343

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Scientific Research Institute of Plant Science and Selection, Novosibirsk

[Abstract] A study is presented of the number and nature of action of genes controlling resistance to loose smut in eight varieties of soft wheat. The work was performed at the Siberian Scientific Research Institute of Plant Science and Selection in 1976-1979. Sixteen direct and reverse combinations of loose smut resistant and moderately resistant strains were tested. Statistical processing of the experimental material was used to determine the degree of phenotypic domination by the Griffing equation, (which is not presented in this article). Various natures of inheritance of resistance were determined, dependent on the manifestation of resistance in the initial parent forms. It is concluded that the relative simplicity of genetic control of the characteristic of resistance in these varieties allows them to be used as donors for selection for immunity. Particular attention should be given the varieties Bezenchukskaya 98, Neepawa, and Patriarca, in which full dominance of resistance is observed upon hybridization. Figures 2; references 25; 12 Russian, 13 Western.

[1618-6508]

UDC: 575.1:579.842.11:579.842.14:582.282.232

GENETIC ACTIVITY OF ANALOGS OF BASES IN SALMONELLA TYPHIMURIUM, ESCHERICHIA COLI AND SACCHAROMYCES CEREVISIAE

Moscow GENETIKA in Russian Vol 20, No 8, Aug 84
(manuscript received 4 Jul 83; in final form 2 Dec 83) pp 1270-1278

PAVLOV, Yu. I., KHROMOV-BORISOV, N. N., Department of Genetics and Selection,
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[Abstract] A comparative study was performed of the activity and specificity of HAP and AHAP, powerful mutagens for both prokaryotes and eukaryotes, on bacteria and yeasts. The variation in action as a function of system of mutagen and excision reparation was studied. The results do not contradict the assumption that both of these analogs are mutagenic for bacteria and yeasts due to errors in the replication process. The toxicity was studied in comparison with a standard mutagen on strains of bacteria which differed in their capability for repair. The spot test was used, recording zones of suppression of bacterial growth. The standard mutagen used, a classical UV mimetic, primarily suppresses the growth of strains with defects in excision repair and mutagen repair. HAP suppresses the growth of the strain

salmonella TA1950, which has a deletion in the uvrB region. AHAP is more toxic for bacteria than HAP, and more strongly suppresses the growth of TA1950. All the data available indicate that the mutagenic effect of HAP and AHAP results from improper replication. Figures 3; references 49: 10 Russian, 39 Western.
[1618-6508]

UDC: 575.24

SELECTIVITY OF MUTAGENIC EFFECT OF CERTAIN SYNTHETIC POLYNUCLEOTIDES IN DROSOPHILA

Kiev DOKLADY AKADEMII NAUK UKRAINSKOY SSR, SERIYA B: GEOLOGICHESKIYE, KHIMICHESKIYE I BIOLOGICHESKIYE NAUKI in Russian No 7, Jul 84
(manuscript received 11 Apr 84) pp 58-60

ALEKSANDROV, Yu. N. and GERSHENZON, S. M., academician, Ukrainian SSR Academy of Sciences; Institute of Molecular Biology and Genetics, Ukrainian SSR Academy of Sciences, Kiev

[Abstract] Results are presented from experiments intended to evoke mutations in drosophila by the use of four synthetic polynucleotides of known chemical structure. Solutions of poly (pA), poly (pI), poly (dA) and poly (pAC) in 0.9% NaCl were injected into young mature drosophila melanogaster males, about 0.25 ml each, containing about 0.25 µg of one of the polynucleotides. The substances used caused the frequency of recessive lethal genes in the second chromosome to increase with very high locus specificity. Only a few loci were affected with a frequency over three orders of magnitude higher than others with spontaneous mutations. This puts forth the hope of learning to cause selective mutations of known genes in higher organisms, a matter of great significance for practical selection and, possibly, some day for medicine. References 8: 2 Russian, 6 Western.
[1622-6508]

UDC: 575.001.2:581.142

PROCESSING RESULTS OF POPULATION-GENETIC STUDIES ON 'ELEKTRONIKA BZ-21' MICROCOMPUTER

Moscow BIOLOGICHESKIY NAUKI in Russian No 7, Jul 84 pp 103-108

ZASYPKIN, M. Yu.

[Abstract] Several programs written by the author were suggested which allowing the Elektronika BZ-21 microcomputer to be used to calculate a number of criteria used in population genetics. The programs were written in true machine language and had to be keyed into the computer each time they were to be run. Calculations performed by these programs include: computation

of 2-allele system parameters; calculation of parameters of a m-allele system where m is not over 6 due to limited machine memory; similarity criterion of two populations based on polymorphous characteristics; genetic similarity I_N and distance D_N ; similarity criterion of several populations based on polymorphous characteristics; and the Chuprov neutral conjugation coefficient. The equations which the computer programs implement are presented in several cases. References 5: 4 Russian, 1 Western.
[878-6508]

UDC: 612.6.05.014.24:577.212.3

OPTIMIZATION OF HYBRIDIZATION CONDITIONS OF CLONED SEQUENCES OF DNA IN SITU
AND OF DIFFERENTIAL STAINING OF HUMAN CHROMOSOMES

Moscow BYULLETEN' EKSPERIMENTAL'NOY BIOLOGII I MEDITSINY in Russian No 5,
May 84 (manuscript received 27 Jun 83) pp 595-598

YUROY, Yu. B., Laboratory of Genetics, All-Union Scientific Center of Mental
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[Abstract] The purpose of this work was to optimize experimental conditions of hybridization of chromosomes in situ of DNA sequences cloned in bacterial plasmids, with subsequent differential chromosome staining. The method of preparing chromosome preparations is described. An isotope label was introduced by the DNA-polymerase substitution reaction. Hybridization of labeled DNA specimens with metaphase chromosomes was performed by several methods described in previous works. The preparations were covered with M emulsion and exposed at 4°C for 3 to 7 days. After autoradiographs appeared and the chromosomes were stained the grains of silver above the metaphase plates were counted. The method which yielded the greatest quantity of DNA in the labeled specimen was as described (in Cytogen. Cell. Genet. Vol. 22, page 352, 1978) by Chandler with several modifications--no HCl and RNAase treatment; denaturation of chromosomes in 70% formamide, 2 SSC at 70°C for 2 minutes; hybridization in 50% formamide and 2 SSC at 37°C for 17 hours; preparations washed with temperature raised to 39°C in two shifts in 50% formamide and 2 SSC for 30 minutes, in two shifts of 2 SSC at room temperature for 30 minutes and finally in alcohol, with the concentration of the DNA specimen increased in the hybridization mixture to 0.1 µg. The method of G-staining of chromosomes through a photoemulsion after appearance of autoradiographs with Romanskoy-Ginz dye was used. An important condition is the use of the chromosomes no later than 7 days after they are prepared, reducing the time of denaturation of the chromosomes in 0.07 M alkali to 30 seconds and staining with 3% stain for 30-40 minutes. The use of formamide or dimethylsulfoxide in place of alkali while retaining the other conditions allows C-segmentation of chromosomes to be revealed. References 16: 5 Russian, 11 Western.
[881-6508]

TEST SYSTEMS FOR BIOMONITORING BASED ON MEMBRANE-BONDED ENZYME COMPLEXES.
REPORT 4. ESTIMATE OF GENOTOXIC EFFECTS IN AMES TEST SYSTEM WITH METABOLIC
ACTIVATION BY MICROSOMAL MONOOXYGENASE FROM FISH LIVER

Moscow BIOLOGICHESKIYE NAUKI in Russian No 5, May 84
(manuscript received 3 Oct 83) pp 85-89

GLAZER, V. M., SAVOV, V. M., ABILEV, S. K., SHESTERIN, S. I., BEYM, A. M.
and KAGAN, V. Ye.

[Abstract] A method was developed for estimating the genotoxic effect of xenobiotics in a modified Ames system in which the postmitochondrial fraction from carp liver is used for metabolic activation. The activity of the S-9 postmitochondrial fraction was determined by the modified Ames test using the test strain *Salmonella typhimurium* TA 100 which allows determination of the mutagenic effect of agents causing base interchange mutations. The results indicate the capability of the oxygenase system with mixed function in fish liver to perform metabolic activation of aromatic polycyclic hydrocarbons forming from them genotoxic derivatives. Storage of the S-9 carp liver fraction in frozen form yields satisfactory results. (Report recommended by Laboratory of Membrane Physical Chemistry, Moscow State University.)
References 20: 6 Russian, 14 Western.
[877-6508]

MOBILE GENETIC ELEMENTS OF R15 PLASMID

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 277, No 4, Aug 84
(manuscript received 3 Jan 84) pp 980-983

DOBRTSA, A. P. and DERGUNOVA, L. V., All-Union Scientific Research
Institute of Applied Microbiology, Serpukhov, Moscow Oblast

[Abstract] A study is made of the mechanisms of mobilization of RP4::Tn1 and pBR322 by R15 plasmid and the characteristics of genetic elements responsible for these processes. The possibility of a new path of combination of the plasmid R15 and RP4::Tn1 was discovered in studying the transfer of Ts^r marker from $recA^+$ and $recA^-$ strains of *E. coli* [R15; RP4::Tn1] to the plasmidless strain *E. coli* 802. Plasmids of this type dissociate by $recA$ -dependent recombination to a 42-Md plasmid identical to the R15 plasmid and a 50-Md plasmid consisting of the genome RP4::Tn1 and an 8.65 Md sequence from R15 at the initial site of insertion of this plasmid. The 8.65 Md fragment has the properties of a mobile element, carries additional genetic determinants and is consequently a transposon which the authors call Tn2353. Judging from restriction and electron-microscope analysis, this transposon is not limited to long inverted or direct repetitions and consequently cannot be

complex. Another sequence represented as Tn2354 is also isolated. Plasmid R15 carrying Tn2353 and Tn2354 is quite effectively inserted into the chromosome of the dnaA^{ts}-mutant of the E. coli leading to suppression of this mutation. The elements can therefore be used not only to mobilize nonconjugative plasmids and form hybrid plasmids, but also to solve problems related to integration of the plasmid in a bacterial chromosome. Figures 4; references 14 (Western).
[815-6508]

UDC: 579.873.1:577.212.3

CLONING OF DNA IN ACTINOMYCETES: CREATION OF VECTOR SYSTEMS

Moscow ANTIBIOTIKI in Russian No 8, Aug 84 (manuscript received 25 Jan 84)
pp 563-572

DANILENKO, V. N., POTEKHIN, Ya. A., BIRYUKOVA, I. V. and NAVASHIN, S. M.,
All-Union Scientific Research Institute of Antibiotics, Moscow

[Abstract] Results are presented from studies on the construction of two new vector amplification systems: based on the plasmid SLP1.2, capable of amplification of the determinant of sensitivity to kanamycin of the strain S. rimosus and based on the multicopy plasmid S. cyanogenus. An attempt was made to separate extrachromosomal DNA from both versions of the strain S. remosus. Repeated passages yielded S. lividans capable of growing in the presence of 50,000 µg/ml kanamycin. Figures 7; references 23: 6 Russian, 17 Western.
[851-6508]

UDC: 575.113:577.21:576.315.42

SEQUENCES OF DNA AND SPECIFICS OF CHROMATIN STRUCTURE IN AREAS PARTICIPATING IN REGULATION OF TRANSCRIPTION OF STRUCTURAL GENES BY EUKARYOTIC CELLS

Moscow USPEKHI SOVREMENNOY BIOLOGII in Russian Vol 98, No 1 (4),
Jul-Aug 84 pp 3-13

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Pushchino, Moscow Oblast

[Abstract] This is a review transcription in eukaryote cells is performed by three RNA polymerases, RNA-polymerase I, II and III. I transcribes genes of rRNA; III transcribes genes of tRNA and 5S RNA; all other genes are transcribed by II. In 1979 the TATA nucleotide sequence was discovered (quite similar to the sequences which act as promoters in prokaryote cells). The TATA block determines the locus of precise initiation of mRNA transcription both in vivo and invitro. The CAAT block is another canonical sequence

found in areas adjacent to the 5' ends of many eukaryotic genes. This sequence participates in regulation of the effectiveness of transcription. The two groups of regulatory nucleotide sequences thus correspond to two types of regulation of transcription: regulation of accuracy and of effectiveness. DNA areas remote from the 5'-ends of structural genes are also involved in regulation. Sectors carrying sites hypersensitive to nucleases either have no nucleosomes or have altered nucleosome distribution. The regulatory function of these sectors is achieved by interaction of specific chromatin proteins with the nucleotide sequences they recognize. The localization of specific proteins in hypersensitive chromatin sectors is reported. References 103: 5 Russian, 98 Western.
[850-6508]

UDC: 577.21:576.3

MULTIPLE-ENZYME SYSTEMS FOR BIOSYNTHESIS OF NUCLEOTIDES IN REPLICATION OF NUCLEIC ACIDS

Moscow USPEKHI SOVREMENNOY BIOLOGII in Russian Vol 98, No 1 (4),
Jul-Aug 84 pp 29-42

KUNIN, Ye. V., Biology Faculty, Moscow State University imeni M. V. Lomonosov

[Abstract] This report reviews data indicating that systems for replication of genetic material (DNA or RNA-containing viruses) are in many cases multiple-enzyme systems. They include not only enzymes catalyzing polymerization of nucleotides and accompanying processes, but also enzymes for synthesis of the nucleotide precursors themselves. Three groups of facts indicating the existence of this type of multiple-enzyme system are noted: 1) data on the presence in the cells of the specific microscopic pools of nucleotides used for replication; 2) results of genetic studies indicating direct participation of nucleotide biosynthesis enzymes in replication and 3) direct biochemical experiments demonstrating the association of nucleotide biosynthesis enzymes with the replicative apparatus. References 82: 7 Russian, 75 Western.
[850-6508]

HUMAN FACTORS

UDC 613.6:621.311.22:658.381.2

WORK CAPACITY OF HEAT AND ELECTRIC POWER PLANT OPERATORS WORKING 12 HOUR DAY AND NIGHT SHIFTS

Moscow GIGIYENA I SANITARIYA in Russian No 3, Mar 84
(manuscript received 25 Jul 83) pp 88-89

NAVAKATIK'YAN, A. O., KAL'NISH, V. V. and LASTOVCHENKO, V. B., Kiev
Scientific Research Institute of Labor Hygiene and Occupational Diseases

[Abstract] Various parameters of CNA and cardiovascular system were analyzed in relation to work performance of 20 individuals employed on 12 h day and night shifts at a heat and electric power plant. The subjects under study consisted of engineers and supervisors responsible for control and managing functions requiring a high rate of information processing. The results indicated that both daytime and nighttime shifts involved compensatory changes in the CNS and the cardiovascular system. Further interesting facts revealed that cardiovascular stress was much more profound during the day shift, while CNS stress predominated during the night shift. These observations indicate inter-system interactions directed to favor the greater emphasis placed on the CNS at night to maintain wakefulness and alertness. Figures 2; references 4 (Russian).
[1505-12172]

UDC: 613.6:66]-07:612.821.1/.3]:658.311.44

SUCCESS IN LEARNING OCCUPATION OF CHEMICAL PRODUCTION TECHNICIAN AS FUNCTION OF CERTAIN PERSONALITY TRAITS AND DEVELOPMENT OF PSYCHOPHYSIOLOGICAL FUNCTIONS

Moscow GIGIYENA TRUDA I PROFESSIONAL'NYYE ZABOLEVANIYA in Russian No 7, Jul 84 (manuscript received 2 Feb 84) pp 22-26

BOBRISHCHEVA-PUSHKINA, N. D., First Moscow Medical Institute
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[Abstract] A study was made of the influence of certain personality traits and the level of psychophysiological functions on the success of students in learning the occupation of chemical technician during studies and

independent work. Forty-eight training school students, 17 to 19 years of age, were observed. Success was judged by questioning teachers and superiors on the job. The students' performance was measured over a period of 1 year. It was found that successful mastery of this occupation was combined with a low level of extroversion, neuroticism and alarm, well developed visual and operational memory, the ability to read the scales of instruments rapidly, deductive thinking, good concentration, distribution and switching of attention. Persons who were easily alarmed did not master the occupational skills and abilities of the technician well and became easily fatigued during independent work. These skills and abilities can be used as prognostic tools in selecting personnel for training and employment as chemical technicians. Figure 1; references 8 (Russian).

[1626-6508]

UDC: 613,6:621.311]-07:612.766.1

STUDY OF BODILY FUNCTIONAL STATUS AND QUALITY OF CONTROLLING ACTION OF POWER UNIT OPERATORS WITH VARIOUS INTENSITIES OF LABOR

Moscow GIGIYENA TRUDA I PROFESSIONAL'NYYE ZABOLEVANIYA in Russian No 8, Aug 84 (manuscript received 7 Jun 83) pp 37-42

PAL'TSEV, Yu. P., KOLESNIKOVA, A. V., LIPKINA, L. I. and FEDOTOV, D. K., Institute of Hygiene imeni F. F. Erisman; All-Union Heat Engineering Institute imeni F. E. Dzerzhinskiy, Moscow

[Abstract] Studies were performed on 300 MW power units operating in a steady state with once per day unloading to 150 MW at night and reloading to 300 MW in the morning. The study of operator's working conditions showed that climate corresponded and light levels corresponded to the hygienic standards. Sound levels were 7 to 9 dB above the standards at 250-8000 Hz. The studies determined bodily functional status, operational loads and quality of control actions under normal working conditions. Eight operators 27 to 36 years of age with at least one year in service at their occupation were studied. It was found that the need to concentrate attention and the high degree of responsibility, coupled with the monotonous nature of the work and insufficient physical activity, could decrease functional activity of the central nervous system and cause stress on the autonomic system. The negative influence of sensory monotony and hypokinesia should be reduced by increasing the number of active actions and motor loading on the body of the operators. By increasing the workload of the operators to reduce boredom and improve efficiency, some 700 highly qualified workers could be liberated to increase the number of power units serviced across the nation. References 10 (Russian).

[1627-6508]

MODEL OF PROCESS OF RETENTION OF INFORMATION IN HUMAN MEMORY

Moscow PSIKHOLOGICHESKIY ZHURNAL in Russian Vol 5, No 4, Jul-Aug 84
(manuscript received 10 Feb 82) pp 29-36

PRISNYAKOV, V. F., doctor of technical sciences, professor, department head,
Dnepropetrovsk State University, PRISNYAKOVA, L. M., assistant,
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[Abstract] Simple mathematical equations are developed to relate the quantity of information assimilated to the basic quantities characterizing the process of input and storage of information in memory. This allows the development of quantitative values for the major variables measured in experiments and comparison of calculated quantities with known experimental results, and also allows a prediction to be made of the relative behavior of a given process related to the functioning of memory. The mathematical equations presented can be used to determine quantitatively the information contained in human memory as a function of the characteristics of the process of input and storage of information. Checking of the mathematical model using experimental data known from the literature has shown its good agreement with experimental data, allowing it to be recommended for practical use. Figures 3; references 4 (Russian), [847-6508]

PROBLEMS OF PSYCHOLOGICAL SUPPORT OF AUTOMATED ORGANIZATION CONTROL SYSTEMS

Moscow PSIKHOLOGICHESKIY ZHURNAL in Russian Vol 5, No 4, Jul-Aug 84
(manuscript received 1 Jun 83) pp 74-82

BEREZKIN, B. S., candidate of technological sciences, docent, deputy department chief, computer center, USSR Academy of Sciences, DRAKIN, V. I., doctor of technical sciences, professor, department head, L. E. Plekhanov, Moscow Institute of the National Economy and LEPSKIY, V. Ye., candidate of psychological sciences, section head, computer center, USSR Academy of Sciences

[Abstract] Hopes for improving the quality of administration by introducing automated systems have not been fully realized, primarily because the automation equipment has yet to become a true assistant to administrators at all levels. In fact, automation is hardly used where it might be most effective, in decision support systems at high administrative levels. Many systems now in operation have underestimated the significance of man in modern administrative systems. Considering this, the problems of psychological support of automatic organizational control systems can be defined as support of inter-organizational interactions as well as internal problems or organization of users, developers and administrative system personnel. Tasks include increasing the convenience of interaction of users with automation equipment, supporting training of users for interaction with automatic equipment, and assuring psychological safety for users as they work with automation equipment.

Problems include the creation of the necessary psychological tool kit and development of new forms of interaction among academic, research and development institutions. Psychological personnel must be trained for work in this new area and new applied psychological disciplines must actually be created to reflect demands of personnel utilizing administrative automated systems. References 39: 31 Russian, 8 Western.
[847-6508]

UDC 616.155.33-008.13-02:615.324:592

EFFECTS OF MARINE INVERTEBRATE BIOGLYCANS ON MACROPHAGE FUNCTION

Moscow ANTIBIOTIKI in Russian Vol 29, No 9, Sep 84
(manuscript received 15 Feb 84) pp 653-657

BESEDNOVA, N. N., OVODOVA, R. G., ZAPOROZHETS, T. S., MOLCHANOVA, V. I.,
KRYLOVA, N. V., NIKITIN, A. V. and KOVALENKO, L. P., Scientific Research
Institute of Epidemiology and Microbiology, Siberian Department, USSR
Academy of Medical Sciences; Pacific Institute of Bioorganic Chemistry,
Far Eastern Scientific Center, USSR Academy of Sciences, Vladivostok;
All-Union Scientific Research Institute of Antibiotics, Moscow

[Abstract] In vivo and in vitro studies were conducted on the effects of
bioglycans 46 and 106 isolated from (un-named) marine invertebrates on macro-
phage function. Studies with peritoneal guinea pig macrophages demonstrated
that exposure to the bioglycans enhances phagocytosis of *Y. pseudotuberculosis*
and *S. typhimurium* in vitro and, to a more moderate extent, bactericidal
activity. Carbon particle clearance studies in CBA mice indicated that
both preparations increased the rate of clearance by 15% after intra-
peritoneal administration of the glycans (400 µg), and by 19.8% after intra-
venous injection. These observations suggest that such marine agents may
have potential clinical usefulness in enhancing the immune system. Figure 1;
references 3: 2 Russian, 1 Western.
[1530-12172]

NEUTRALIZING EFFECT OF HUMAN BLOOD PREPARATIONS ON SHIGELLA AND CHOLEROGEN TOXINS

Moscow ZHURNAL MIKROBIOLOGII EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 6, Jun 84 (manuscript received 14 Sep 83) pp 64-68

KAMZOLKINA, N. B., BORISOVA, I. V. and MITSKEVICH, Ye. D., Moscow
Scientific Research Institute of Epidemiology and Microbiology
imeni G. N. Gabrichevskiy, Moscow

[Abstract] A study was made to find whether normal sera from practically healthy persons, colostrum from healthy relatives and commercial gamma globulin preparations can neutralize the enterotoxic activity of neurotoxin of *S. dysenteriae* 1, live virulent *S. sonnei* culture and cholero-gen--to gain an understanding of the presence of neutralizing antibodies in these preparations. In parallel experiments, an isolated rabbit-small-intestine loop was used to test the neutralizing activity of rabbit blood serum hyperimmunized with anatoxin from *S. dysenteriae* 1 neurotoxin. Suppression of the enterotoxic effect of neurotoxin *S. dysenteriae* 1 was observed when homologous hyper-immune serum from rabbit No. 143 was used, active in a dilution of more than 1:1250. The serum of specifically immunized goats was also effective at a dilution of 1:50. Some preparations of commercial gamma globulin and normal goat serum were also affected. In the isolated-loop model the possibility was demonstrated of neutralizing the enterotoxic effect of virulent *S. sonnei* cultures by certain normal human blood sera, commercial gamma globulin preparations and human colostrum. The enterotoxic properties of cholero-gen can be neutralized by immune rabbit serum to certain antigen preparations from cholera vibrios and *Shigella*, normal rabbit serum, as well as commercial gamma globulin preparations and human colostrum. References 7: 3 Russian, 4 Western.
[1591-6508]

UDC: 615.849.1.015.4:[615.919:579.843.1

INFLUENCE OF GAMMA RADIATION ON IMMUNOBIOLOGIC AND IMMUNOCHEMICAL PROPERTIES OF CHOLERA EXOTOXIN. REPORT 3. SEROLOGIC ACTIVITY AND IMMUNOCHEMICAL PROPERTIES OF IRRADIATED NONPURIFIED TOXIN

Moscow ZHURNAL MIKROBIOLOGII EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 6, Jun 84 (manuscript received 30 Jul 83) pp 76-79

NEDUGOVA, G. I., RUBTSOV, I. V. and SAMOYLENKO, I. I., Central Scientific Research Institute of Epidemiology, USSR Ministry of Health, Moscow

[Abstract] A study was made of the influence of ionizing radiation on the serologic activity and immunochemical properties of nonpurified cholera exotoxin. Preparations of nonpurified cholera enterotoxin were used--a

microbe-free centrifugate of the strain *Vibrio cholerae* 569 B irradiated in dry and liquid form by gamma radiation at doses of 10 to 350 kGr. The immunochemical properties of irradiated and nonirradiated preparations were studied in the precipitation reaction, immunoelectrophoresis, disk electrophoresis in polyacrylamide gel and a combination with subsequent immunodiffusion in a gel. It was found that irradiation of the exotoxin with increasing doses of gamma radiation leads to an increase in electrophoretic mobility of protein components of the toxin filtrate, a decrease in the total number of protein zones and aggregation of individual components. The serologic activity was retained within the limits of the radiation doses studied. References 9: 8 Russian, 1 Western.
[1591-6508]

UDC: 616.98:578.891]-078.73

INFLUENCE OF CONTENT OF ANTIBODIES TO HEPATITIS A VIRUS IN IMMUNOGLOBULIN PREPARATIONS ON EFFECTIVENESS OF IMMUNOGLOBULIN PROPHYLAXIS OF HEPATITIS A

Moscow ZHURNAL MIKROBIOLOGII EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 6, Jun 84 (manuscript received 18 Jul 83) pp 86-89

GORBUNOV, M. A., SUMAROKOV, A. A., YAROSHEVSKAYA, I. Yu., IKOYEV, V. N., KHALITOVA, K. A., DZHURAKHODZHAYEV, A. K., ASER'YANTS, I. S., MALIKOV, E. M., BYCHENKO, V. D. and NARKEVICH, M. I., State Scientific Research Institute of Standardization and Testing of Medical Biological Preparations imeni L. A. Tarasevich, USSR Ministry of Health, Moscow

[Abstract] A study was made in 1982 in a city in the Uzbek SSR, of the effectiveness of immunoglobulin prophylaxis of hepatitis A using preparations with various contents of anti-VHA under controlled epidemiologic experimental conditions. Two series of 10% commercial immunoglobulin were used with anti-VHA titers of 1:2500 and 1:10,000. The prophylactic effect was studied in two rayons of the city: the Central and the Kirgulin rayons, the latter 8 km from the center of the city. Preparations were administered at a dose of 0.75 ml to groups formed by random sampling. It was found that the effectiveness of immunoglobulin prophylaxis of hepatitis A varies with anti-VHA titer. The preparation with titer 1:10,000 was 3 times more effective in protecting subjects than the preparation with titer 1:2500. The effectiveness of immunoglobulin prophylaxis of hepatitis A can be increased by using preparations with higher antibody titers. References 6: 2 Russian, 4 Western.
[1591-6508]

IMMUNOENZYME ANALYSIS

Riga SOVETSKAYA LATVIYA in Russian 25 Aug 84 p 4

ANDREOTTI, Yu.

[Abstract] Immunoenzyme analysis which Soviet specialists are now employing is described as a new method of early diagnosis of disease. It is said to be able to diagnose the earliest stages of disease by testing but a single drop of blood. Immunoenzyme analysis is under study by several of the leading scientific research institutes in the Soviet Union, under the leadership of the Department of Enzymology, a part of the Department of Chemistry of Moscow University. It is headed by Il'ya Vasil'yevich Berezin, corresponding member of the USSR Academy of Sciences and Lenin Prize Laureate. Immunoenzyme analysis will greatly facilitate the diagnosis of infectious disease as well as diabetes and cancer.

[826-6508]

UDC: 578.833.26.083.24.04:615.373.6

SUPPRESSION OF ACCUMULATION OF LASSA VIRUS IN VERO CELLS BY IMMUNE GAMMAGLOBULIN AND COMPLEMENT

Moscow VOPROSY VIRUSOLOGII in Russian Vol 29, No 4, Jul-Aug 84
(manuscript received 2 Aug 83) pp. 473-476

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[Abstract] A study is reported of the inhibitor effect of antibodies and complement on accumulation of lassa virus in Vero cells, as well as the significance of these preparations in the development of the cytodestructive effect in infected cells. Studies were performed to determine the dose of gamma globulin necessary to achieve the maximum inhibitory effect. The data presented indicate that the use of immune gamma globulin and complement for Vero cells infected with lassa virus leads to suppression of accumulation of the virus in the culture medium and development of clear cytodestructive changes in the monolayer. The degree of suppression of accumulation of the virus depends not only on the preparations used but also on the time of administration after infection. Gamma globulin in combination with complement results in a cytodestructive effect and clearly suppresses the accumulation of virus in the culture medium. Figures 3; references 9: 5 Russian, 4 Western.

[1601-6508]

RESULTS OF IMMUNIZATION OF PEOPLE WITH NEW ANTIRABIES VACCINE NOT CONTAINING NEUROALLERGENIC BRAIN TISSUE FACTOR

Moscow VOPROSY VIRUSOLOGII in Russian Vol 29, No 4, Jul-Aug 84
(manuscript received 16 Nov 83) pp 437-441

UNANOV, S. S., PILLE, E. R., LEVCHENKO, Ye. N., KARAKUYUMCHAN, M. K.,
YUMINOVA, N. V. and SHKOL'NIK, R. Ya., Moscow Scientific Research Institute
of Viral Preparations, USSR Ministry of Health

[Abstract] Results are presented from a study of the reactogenic and antigenic properties of a new vaccine used to immunize volunteers as well as persons with animal bites where rabies was suspected. Commercial Fermi antirabies vaccine was used as a control. The vaccine was administered subcutaneously under the skin of the abdomen each day, revaccination performed twice at 10-day intervals after the main course. Antirabies horse immunoglobulin was administered one day before the beginning of vaccination. Local reactions were observed in 39.6% of the subjects, erythema in 31.9%, rash, painfulness in 15.5-21.4% of the subjects. The Fermi vaccine caused reactions in 60.9% of the subjects: erythema in 46.9%, infiltrate in 32.8%, swelling and painfulness at the point of administration in 40.6 and 51.6%. Systemic reactions were recorded in 6.03%. Reactions were moderate, brief and did not require interruption of the course of vaccination. The Fermi vaccine caused systemic reactions in 31.3%. The purified vaccine was equal to the Fermi vaccine in humoral immunity which developed. References 12: 4 Russian, 8 Western.
[1601-6508]

UDC: 616.36-002-022:578.891:578.74]-07

HB_e ANTIGEN AND ANTIBODIES FOR IT IN ACUTE AND CHRONIC HEPATITIS B

Moscow VOPROSY VIRUSOLOGII in Russian Vol 29, No 2, Mar-Apr 84
(manuscript received 1 Jul 83) pp 167-172

VOROZHBIYEVA, T. Ye., KETILADZE, Ye. S., MEYNARD, J. I., MURPHY, G. L.,
FARBER, N. A. and KOZLOVA, T. P., Institute of Virology imeni D. I. Ivanovskiy,
USSR Academy of Medical Sciences, Moscow; WHO Center for Viral Hepatitis,
Phoenix, Arizona, USA

[Abstract] A study is reported of the specifics of determination and the prognostic significance of HB_eAg and anti-HB_e in various clinical forms of acute hepatitis B using sensitivity method markers for indication. 100 Males and 141 females hospitalized at the D. I. Ivanovskiy Institute of Virology were studied, including 220 adults, ages 15 to 78, and 21 children, ages 2 1/2 months to 12 years. In addition, 210 patients with chronic liver disease with HB_s antigen and HB_s antigen carriers were studied. Patients

with high HB_s-Ag concentrations as indicated by the double immunodiffusion test were found to have the HB_e antigen much more frequently, whereas HB_e antibodies were found more frequently in patients with low HB_s-Ag concentrations. Within the first week of the onset of acute hepatitis B, most^s patients had positive DID HB_e. A correlation was found between discovery of the e system and the clinical course of the disease. In the severe form the concentration of e antigen was sufficient for radioimmunoassay determination significantly more frequently than in the mild form. Presence of HB_eAg as determined by RIA, particularly if it remain for 2 to 3 months, was characteristic for patients with a higher risk of development of the chronic disease. Figures 3; references 21: 3 Russian, 18 Western.
[1531-6508]

UDC: 615.373.3.012(048.8)

SOME APPROACHES TO DESIGN OF ANTIVIRAL VACCINES (THEORETICAL REVIEW)

Moscow VOPROSY VIRUSOLOGII in Russian Vol 29, No 2, Mar-Apr 84
(manuscript received 5 May 83) pp 137-140

DZAGUROV, S. G., GNUNI, G. M. and KHVOLES, A. G., State Institute for Standardization and Testing of Medical Preparations imeni L. A. Tarasevich, USSR Ministry of Health, Moscow

[Abstract] This article is a review. The known difficulties of creating effective antiviral vaccines without excessive harmful side effects make it important to investigate new approaches to the creation of more effective preparations. The principles have been created for development of subunit and subvirion vaccines. A strategy has been experimentally developed for producing more stable influenza vaccines by the use of various hybrid strains. The most pressing problem is determination of genetic redundancy in the structure of the viral genome itself. The genetic information study of the process of selection of bacteriophages indicates that small bacteriophages have segments with unutilized cistrons on the genome filaments. Calculation of genetic redundancy is thus not unique for viruses but can also be utilized at the cellular level of biological organisms. All this has resulted in formulation of the conclusion of the biological sense of existence of redundancy in that individuals can accumulate evolutionary changes in unused and excess portions of DNA. Precise detailed analysis of the viral genome structure considering the presence of sections of genetic redundancy is extremely important for further planning and creation of new preparations by gene engineering methods and introduction of biological engineering developments to the field. References 18: 11 Russian, 7 Western.
[1531-6508]

MONOCLONAL ANTIBODIES. NEW CAPABILITIES FOR DIAGNOSIS OF HEPATITIS B

Moscow VOPROSY VIRUSOLOGII in Russian Vol 29, No 2, Mar-Apr 84
(manuscript received 25 May 83) pp 132-137

NOVOKHATSKIY, A. S. and ZHDANOV, V. M., Institute of Virology
Imeni D. I. Ivanovskiy, USSR Academy of Medical Sciences, Moscow

[Abstract] Information is presented on the major trends in development of new technologies for the production of diagnostic preparations for hepatitis B virus. Several research groups have suggested test systems for detection of hepatitis B virus using monoclonal antibodies and radioimmune analysis in the solid phase. However, monoclonal antibodies may significantly change reactivity of interaction with the hepatitis B surface antigen. The use of monoclonal antibodies for immunologic diagnosis of hepatitis B assumes the presence of a number of properties necessary for the assurance of high sensitivity of the test method and reproducibility of results. The antibodies must first of all have high affinity. The idiotype of monoclonal antibodies is very important. Monoclonal IgM are most convenient, providing high effectiveness of serologic reactions with antigens.
References 18 (Western),
[1531-6508]

UDC: 615.371

FORMATION OF SPECIFIC ANTIBODIES IN ANIMALS IMMUNIZED WITH RIBOSOMAL PROTEUS VACCINE

Moscow MIKROBIOLOGIYA in Russian Vol 46, No 4, Jul-Aug 84
(manuscript received 15 Apr 83) pp 68-71

OVETCHIN, P. V. and TSYGANENKO, A. Ya., Khar'kov Medical Institute

[Abstract] Results are presented from studies of the dynamics of accumulation of specific antibodies in mice immunized with ribosomal proteus vaccine obtained from the strain *Proteus vulgaris* F-30. In the first series of experiments the protective properties of ribosomal vaccine were tested. Eight days after a second vaccination (interval between vaccinations 7-8 days), mice were infected with *Proteus vulgaris* F-30 and clinical strains of *P. vulgaris* 2073 and *P. mirabilis* 1840 at 3, 7 and 10 DLM. The results indicate that the ribosomal proteus vaccine doses of 1 and 10 µg protein per mouse completely protected the mice from 7 DLM of the same strain. The protective effect of a corpuscular proteus vaccine and the formation of antibodies in animals immunized with this vaccine were also studied. It was found that the protective effect of the two vaccines was the same, but the antibody titer on

the 3rd and 5th day following one time immunization with the corpuscular vaccine was lower. On the 7th and 10th days after single immunization, as well as the 5th, 7th and 10th days after double immunization, the antibody titers were the same. The results produced thus indicate the advantage of ribosomal proteus vaccine over corpuscular. References 20: 10 Russian, 10 Western,
[814-6508]

LASER EFFECTS

UDC 577.391;591.48;535.37;621.375.8

EFFECT OF LOW INTENSITY LASER RADIATION ON ACTIVITY OF RAT BRAIN CHOLINESTERASE

Moscow RADIOBIOLOGIYA in Russian Vol 24, No 4, Jul-Aug 84 (manuscript received 4 Apr 83) pp 565-568

[Article by A. T. Pikulev, I. P. Khripchenko and G. I. Lepesheva, Department of Biochemistry, Belorussian State University imeni V. I. Lenin, Minsk]

[Text] The literature contains some data indicating that change occurs in cholinesterase activity in response to laser radiation [1,2]. However, the mechanisms and causes of change in enzymatic activity are insufficiently clear. It would be important in this aspect to observe the dependence of cholinesterase activity (KF 3.1.1.7 [not further identified]) on irradiation time with regard for the particular influence of low intensity (9 mw) laser radiation in subcellular brain fractions in experiments conducted *in vivo* and *in vitro*.

Materials and Methods

The research was conducted on randobretnyye [translation unknown] convectional male rats weighing 126-200 gm maintained on a stable vivarium ration. The animals were irradiated by a helium-neon continuous-action LG-50 laser with a wavelength of 632.8 nm and an output power of 9 mw. Exposure times were 1, 10, 15, 20 and 30 minutes. In the *in vivo* research the immobilized animals were irradiated with a laser beam pointed at the head. Hair was first cut away because it absorbs considerable amounts of laser light and significantly weakens its action [3]. In the control group the animals were immobilized and left in this state for a time corresponding to the irradiation time. Twenty minutes after irradiation the animals were decapitated. The brain was removed and a 10 percent brain homogenate was prepared with tris-saccharose buffer with a pH of 7.4 at 4°C. The subcellular fractions were isolated by the method described in [4]. In the *in vitro* experiments the subcellular fractions were irradiated for the same amounts of time in glass weighing bottles on ice, and experimental samples were taken 20 minutes after irradiation. Cholinesterase activity was determined by the method described in [5], and it was expressed in pkkatal [not further identified; picocatal?] per milligram of protein. The obtained data, which were treated by the method of biological statistics [6], are presented in the table below.

Results and Discussion

As is evident from the table, cholinesterase activity in the brain of intact animals distributed itself in the following fashion in different subcellular fractions: 34.6 percent in the low-velocity fraction, 41.8 percent in the mitochondrial fraction and 23.6 percent in the supernatant liquid. This distribution of enzymatic activity in subcellular fractions corresponds to published data [7-9]. Research conducted on animals irradiated by non-coherent light of the same intensity did not establish any statistically significant changes in cholinesterase activity; therefore immobilized rats were used as a control in the subsequent work.

Cholinesterase Activity in Subcellular Fractions of the Rat Brain in Different Experimental Conditions (pkkatal/mg protein)

(1)	(2) Фракция		
Длительность иммо- билизации или облу- чения, мин	низкоскоростная (3)	митохондриальная (4)	надосадочная жид- кость (5)
	$\bar{X} \pm S_{\bar{x}}$		
(6) Интактные			
—	192,76 $\pm$ 1,75	283,00 $\pm$ 2,81	231,02 $\pm$ 2,97
(7) Стресс			
1	192,76 $\pm$ 6,51	338,31 $\pm$ 8,51*	234,05 $\pm$ 6,08
10	182,24 $\pm$ 8,68	361,72 $\pm$ 4,26*	224,73 $\pm$ 13,39
15	185,74 $\pm$ 3,50	365,97 $\pm$ 2,34*	227,94 $\pm$ 14,52
20	178,73 $\pm$ 6,19	372,32 $\pm$ 3,20*	237,14 $\pm$ 6,32
30	176,18 $\pm$ 4,85	370,84 $\pm$ 5,11*	235,07 $\pm$ 9,83
(8) Облучение in vivo			
1	203,26 $\pm$ 7,01	334,05 $\pm$ 2,12	226,94 $\pm$ 6,02
10	192,75 $\pm$ 5,26	283,00 $\pm$ 2,13*	209,74 $\pm$ 6,08
15	212,02 $\pm$ 14,0	257,83 $\pm$ 6,44*	204,69 $\pm$ 3,03
20	184,00 $\pm$ 3,50	261,71 $\pm$ 6,34*	185,51 $\pm$ 7,51*
30	181,73 $\pm$ 8,12	262,56 $\pm$ 6,40*	184,37 $\pm$ 15,5*
(8) Облучение in vitro			
1	194,50 $\pm$ 5,26	280,86 $\pm$ 8,94	231,11 $\pm$ 6,08
10	124,41 $\pm$ 11,5*	197,88 $\pm$ 8,72*	145,90 $\pm$ 12,2*
15	103,38 $\pm$ 4,73*	146,18 $\pm$ 6,58*	139,82 $\pm$ 9,16*
20	110,41 $\pm$ 6,11*	148,94 $\pm$ 5,10*	136,73 $\pm$ 8,23*
30	114,51 $\pm$ 6,12*	148,90 $\pm$ 6,34*	138,11 $\pm$ 8,57*

Note: Eight to ten rats were used in each series.

* Differences are significant ($p < 0.05$).

Key:

- | | |
|---|-----------------------|
| 1. Time of immobilization or irradiation, min | 5. Supernatant liquid |
| 2. Fraction | 6. Intact |
| 3. Low-velocity | 7. Stress |
| 4. Mitochondrial | 8. Irradiation |

Cholinesterase activity determined in stressful conditions in the *in vivo* experiments varied in different ways in the fractions that were studied. Thus enzymatic activity decreased from 100 to 92.8 percent when immobilization time was increased from 1 to 20 minutes respectively (see table). On the other hand a sharp rise in cholinesterase is noted in mitochondria: Enzymatic activity was 119.8 percent in rats immobilized for 1 minute, and in rats subjected to stress for 20 minutes it reached 132 percent of the level in intact rats. Fluctuations in enzymatic activity were insignificant in the supernatant liquid; the differences between data for intact and immobilized animals were statistically insignificant. This may be interpreted as participation of the acetylcholine-cholinesterase system in the organism's stress reaction. That this is true has been pointed out on several occasions [9,10].

Change in cholinesterase activity in subcellular fractions of the brain of irradiated rats was not observed following a 1-minute exposure. Changes appear after 10 minutes of irradiation, and they are more pronounced in mitochondria: Activity is reduced by 22 percent. Following 15 minutes of irradiation, a 15 percent increase in enzymatic activity is noted in the low-velocity fraction, while enzymatic activity in mitochondria and in the supernatant liquid decreases by 30 and 10 percent respectively.

When the exposure time is increased to 20 minutes, cholinesterase activity in the analyzed fractions remains at the same level as after 15 minutes of irradiation. Thus the results of research on the influence of laser radiation on enzymatic activity are hard to interpret unambiguously. As we know, the action of laser light is different from all other types of emissions [11]. It would be more suitable to associate the unique action of laser radiation on biological systems with certain of its features such as coherence and monochromaticity. High monochromaticity of laser radiation makes the selective excitement of specific oscillatory sublevels in molecules possible. First of all this can influence the energetic and conformational state of individual portions of protein molecules [12]. Considering this, the decrease in cholinesterase activity in response to laser radiation in the *in vivo* experiments may be a consequence of conformational changes in the cholinesterase molecule impairing the function of the enzyme's active center. This conclusion is supported by data indicating that ATPase activity rises in response to laser radiation [13], if we take account of the suggestion made in [14] that acetylcholinesterase and ATPase are a system basically consisting of the same protein performing different functions in alternation. It may be possible that conformational changes cause the activity of the active center responsible for cholinesterase properties to decrease under certain conditions, and that of the center responsible for ATPase properties to increase [13].

Reduction of cholinesterase activity may be associated with additional release of acetylcholine from synaptic vesicles owing to change, noted in [15], in membrane state in response to laser radiation. Selective inactivation of mitochondria, which has been noted several times in the literature [3,13,14], may be capable of playing a certain role in reduction of cholinesterase activity: Such inactivation may exclude cholinesterase associated with mitochondrial membranes from the overall cholinesterase activity [8,15]. Evidence of this can be found in our data (see table).

In the *in vitro* experiments, cholinesterase activity in subcellular brain fractions decreases beginning with 10-minute exposure, and the decrease persists at lower levels at all times of observation. In this case the most pronounced changes in enzymatic activity are noted in mitochondria. Thus comparing the activity of cholinesterase in the *in vivo* and *in vitro* experiments, we can note that inhibition of the enzyme in response to laser radiation is more pronounced *in vitro*. This is apparently associated with the fact that some part of the laser radiation used in the *in vivo* experiments is absorbed by skin, bones and so on [3]. Moreover compensatory mechanisms may go into action at the level of the integral organism, influencing the activity of the cholinergic system to some degree. Of concurrent interest is the fact that low intensity laser radiation (9 mw) does not cause redistribution of enzyme between subcellular brain fractions at any of the exposure times; on the other hand the effect of laser radiation expresses itself immediately--after a 1-minute exposure, after which it persists at the same level, with some intensification of the effect occurring (see table). But this action is most pronounced in the *in vitro* experiments. On this basis we may suggest that laser radiation with an intensity of 9 mw elicits a primary effect appearing as change in the structure of the enzyme protein, assuming that cholinesterase is a light-perceiving compound in a hypothetical photoregulatory system, for which, as is stated in [15,16], change in activity not depending on irradiation time must be typical, as was shown with catalase as an example.

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CSO: 1840/1528

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INFLUENCE OF HELIUM-NEON LASER RADIATION ON MORPHOLOGY OF EXPERIMENTAL
ALLERGIC CONTACT DERMATITIS

Moscow BYULLETEN' EKSPERIMENTAL'NOY BIOLOGII I MEDITSINY in Russian No 5,
May 84 (manuscript received 10 Jun 83) pp 603-605

PERSINA, I. S., RAKCHEYEV, A. P., Department of Dermatology (headed by
Professor A. A. Kalamkaryan), Central Scientific Research Skin and Veneral
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[Abstract] A study is presented of the influence of a helium-neon laser on the structure of the skin in allergic contact dermatitis (ACD). Three series of experiments were performed on guinea pigs involving irradiation of the skin on the side surface of the body and ACD induced by dinitrochlorobenzene. Biopsies were performed 24 hours after exposure to DNCB and/or laser radiation. Macroscopic observation and morphologic study indicated that laser radiation significantly reduced the reaction of the skin to DNCB in sensitized animals. The laser radiation increased metabolic processes in the epidermal and dermal cells and activated transport processes in the capillaries. Figures 2; references 7: 5 Russian, 2 Western.
[881-6508]

BRIEFS

LASER CARDIAC RESUSCITATION--The ambulance siren disrupts the hospital quiet. A middle-aged man is delivered to the resuscitation chamber of the Scientific-Research Institute of Experimental and Clinical Therapy of the Georgian SSR Ministry of Health with a diagnosis of an acute myocardial infarct. For five days all of the required drugs were used and the most modern apparatus was switched on. On the sixth day there was a threat of cardiac ventricular fibrillation which is tantamount to cardiac arrest. It was then decided to take advantage of a new method which was being developed for several years by Institute associates. The new method, developed by Doctor of Medical Sciences, Professor Gul'nara-Chapidze, Candidate of Technical Sciences Leonid Shperling, Candidate of Medical Sciences Merab Bokhua and others, is based on the curative properties of a laser beam. The Georgian physicians are the first in the medical profession to suggest the introduction of a laser guide into the cardiac cavity to remove the most serious disturbances of cardiac activity by laser irradiation. "One might say that the new method saved the patient," said the Institute's director, Corresponding Member of the USSR Academy of Medical Sciences Nodar Kipshidze, "Cardiac rhythm was restored immediately after the laser beam was introduced, and what is most important, ventricular fibrillation was prevented. Recovery followed, and our patient was recently discharged and will be able to go back to work. Many experimental studies have proven the effectiveness of the new method and will assure its broad clinical use for treating arrhythmia as well as myocardial infarction. We have now begun to develop the method for use in hospitals, for practicing physicians who will be able to use this treatment independently." [By A. Kikodze] [Text] [Moscow NEDELYA in Russian No 33, 1984 p 4] 6289

CSO: 1840/1534

MARINE MAMMALS

DOLPHIN RIDDLE

Moscow SOVETSKAYA ROSSIYA in Russian 12 Sep 84 p 4

KALENIKIN, S.

[Abstract] Scientific research has proven that dolphins do not dream. This is because, since they must breathe air but live in water, they cannot fall into deep sleep or they would drown. Dolphinologists wonder how dolphins can sleep in storms which may last for many days. Other mysteries of dolphin sleep include the fact that their vision remains active. Scientists also have long wondered how intelligent dolphins are. Researchers have learned that dolphins use several hundred sound signals to communicate with each other, although scientists have not yet learned to understand the language of the dolphins.

[822-6508]

MEDICINE

WORKING UNION OF MEDICS AND ENGINEERS DISCUSSED

Moscow APN DAILY REVIEW in English 14 Sep 84 pp 1-3

[Article by Academician G. Nikolayev, Hero of Socialist Labor, and Academician V. Savelyev, Academy of Medical Sciences of the USSR, USSR State Prize winner]

[Text] To this very day, various defects of cardiac valves plague hundreds of thousands of people, bringing them quite a lot of suffering and early disability. Over the past decades science and the public health system have done much for effective treatment of defective cardiac valves. The implantation of cardiac valve prostheses has become an accepted practice now. Soviet industry has started the production of most advanced mechanical prostheses, while the joint efforts of cardiologists, surgeons, diagnosticians and anaesthesiologists have helped substantially reduce the risks involved in such operations and improve their results.

On the other hand, even the most advanced models of mechanical valve prostheses cannot match natural healthy human valves in terms of their physical and hydraulic characteristics. These prostheses produce high pressure differentials and, consequently, demand greater efforts from the heart, which cause undesirable blood-stream turbulences and necessitate regular, life-long administration of anticoagulants: the substances preventing the coagulation of blood.

The latest Soviet and world experience clearly shows that mechanical prostheses can well be replaced with semi-biological valve substitutes or bioprostheses. Their support elements are made of metals and plastics, while the working part--of specially treated human and animal tissues. They are free of many faults of the mechanical prostheses. However, the reliability of such valves has left much to be desired for a long time.

In the Soviet Union bioprostheses have been developed and tested for more than ten years now by teams of clinical doctors, mechanics, surgeons, hydraulic engineers, experimenters and engineers from the All-Union Research Centre of Surgery of the USSR Academy of Medical Sciences, the A.N. Bakulev Institute of Cardiovascular Surgery of the USSR Academy of Medical Sciences, the Moscow Bauman Higher Technical School and several other institutions.

They have accomplished an extensive program of research which has resulted in the development and clinical application of a whole family of home-designed cardiac valve prostheses.

First of all, the authors studied the morphology and biomechanics of natural cardiac valves of humans and of various mammals, establishing a number of their qualities which were formerly unknown to science.

Using this invention, experts have suggested several fundamentally new models of support frames for the biological (working) part of prostheses, based on accurate engineering calculations, and have become the first in the world to design a new technology for the production of bioprostheses. This technology will help turn biological tissue into a homogeneous "polymer" in no way inferior to natural tissues in terms of its strength. The tissue of bioprostheses has proved to be resistant to physical and chemical effects and enzymes, and is biologically inert, non-toxic and sterile.

Numerous tests of bioprostheses have shown that their hydraulic characteristics are almost the same as those of natural valves.

Surgeons at the All-Union Research Center of Surgery and at the Bakulev Institute of Cardiovascular Surgery have performed more than 700 operations with new bioprostheses. The observations over the operated patients in the course of 12 years after the replacement of the tricuspid valve and 6 years after the replacement of the mitral and aortic valves have shown that bioprostheses ensure good results, that the risk of complications compared to mechanical prostheses is much lower and that in many cases patients are relieved of life-long administration of anticoagulants.

Clinical application of new bioprostheses is getting increasingly widespread. They are effectively used in their practice by many Soviet cardiovascular surgery centres.

Generalization of the clinical experience of the use of bioprostheses testifies to their effectiveness, mechanical reliability and the lack of complications involving the formation of thrombi. Bioprostheses of cardiac valves improve the general conditions of patients. Surgical treatment has now become possible for patients for whom the administration of anticoagulants is counterindicated. These are people who suffer from hypertension, stomach ulcers and other diseases.

It is hard if not altogether impossible to calculate the economic effect of the introduction of new prostheses for the very simple reason that it is impossible to evaluate the price of human life or health. Even so, it can be safely asserted that these savings are measured in millions of roubles, if one is to take into account the reduced payments of government funds for temporary and terminal disability.

The team of researchers and engineers who have developed and introduced new prostheses for cardiac valves have done a great and important job for the nation's medical science and for practical medicine. The comprehensive character of the investigations carried out in the course of several years is very impressive indeed. The team responsible for the invention of bioprostheses has been rightfully nominated for a USSR State Prize for 1984.

(IZVESTIA, Aug 30. In full.)

COMPUTERIZED MEDICAL DIAGNOSTIC COMPLEX "MEDIANA-1"

Kiev PRAVDA UKRAINY in Russian 16 Sep 84 p 3

[Article by Alikhanyan, Ye.]

[Excerpt] A medical complex for the automation of diagnostic processes, "Mediana-1" developed by the personnel of the Kiev Inter-Industry Experimental Laboratory is able to study the heart function of a patient, make a cardiogram and issue a precise diagnosis, taking only five minutes to do this. The complex is intended for cardiology clinics and functional diagnosis units. Its compactness permits its installation, also, in medical sections of enterprises, organizations and educational institutions, and in sea transport.

The "Mediana-1", which includes a computer, a plasma video terminal and an information recording device, is also capable of quickly performing precise cardiologic studies, such as vectorcardiography, and evaluating the contractile function of the heart muscle. In preventive examination, the new apparatus also can study functions of attention and operational memory and perform a whole series of diagnostic tasks. Scientists of the Kaunas medical and polytechnic institutes and personnel of the Kaluga Radiotelegraphy Apparatus Plant and industrial enterprises of Vinnitsa took part in the development of the "Mediana", which was done under the direction of Doctor of Medical Sciences B. Sh. Lazaretnik. Test prototypes were manufactured at a Kiev plant.

"The program software and the hardware components of the new complex's computer conform to the world's best present-day models in the field of computerized diagnosis," said K. S. Ternovoy, member of the Ukrainian Academy of Sciences and Ukrainian SSR deputy minister of public health.

FTD/SNAP

CSO: 1840/1535

MEDICAL RADIOTHERMOMETER DEVELOPED

Moscow TRUD in Russian 21 Sep 84 p 4

[Article by Redin, V. (Gor'kiy)]

[Excerpt] A unique apparatus for medicine has been developed and built under the direction of Vsevolod Sergeyevich Troitskiy, corresponding member of the USSR Academy of Sciences, at the Gor'kiy Radiophysics Scientific Research Institute (NIRFI). This apparatus is capable of determining the temperature of any point of the human body with an accuracy to within one-tenth of a degree.

...The diagnostic laboratory of the Gor'kiy Medical Institute's nerve-disease clinic in the Oblast Hospital imeni Semashko is an ordinary-looking one, similar to many others. Not everything here is ordinary, however; one of several radiothermometers which have been developed at NIRFI is installed in this laboratory. Here V. Tseytlin, a junior science associate, switched on the radiothermometer and held a special antenna to the head of a patient. A. Gustov, docent of the medical institute's chair of nerve diseases, commented in a low voice:

"Treatment has been completed successfully. This person was suffering from a disease of the brain vessels, but now his condition is much better. The uniqueness of the Gor'kiy radiophysicists' innovation lies in the fact that we are now obtaining, in therapeutic practice, extremely precise information on complex biochemical processes which take place in the body in certain diseases."

The first-generation of this type of apparatus was developed at NIRFI a few years ago. It was bulky and not completely perfected. Its younger brother, a second-generation radiothermometer, is now giving reliable service at Oblast Hospital No. 39. And the most sophisticated radiothermometer of this type, the third-generation instrument, was sent to the USSR Exhibition of National Economic Achievements in Moscow recently, among numerous other exhibits and technical innovations which Gor'kiy specialists have developed and produced.

FTD/SNAP
CSO: 1840/1535

UKRAINIAN STATE PRIZE NOMINATION FOR WORK ON COMPUTERIZED DIAGNOSTIC COMPLEX

Kiev PRAVDA UKRAINY in Russian 23 Sep 84 p 3

DANILENKO, M., professor, corresponding member of the USSR Academy of Medical Sciences

[Abstract] The author comments on a work entitled "Development of a Computerized Base Therapeutic and Functional Diagnostic Complex and its Employment in Clinical Surgery" and on the features and uses of this development. He endorses the nomination of this work for the Ukrainian SSR State Prize. The diagnostic complex was developed by a group of specialists of the Kiev Scientific Research Institute of Clinical and Experimental Surgery, the Ukrainian Academy of Sciences' Institute of Cybernetics imeni Glushkov, the Vinit'sa Polytechnic Institute, the Vinnitsa Medical Institute imeni Pirogov and the Central Design Bureau of Information Technology.

The author relates that the complex is capable of performing a wide range of tasks in the automatic mode, including the recording and interpretation of electrocardiograms, the recording of electroencephalograms, and analysis of auditory and visual potentials. The complex employs a program, "Marker", of original structure and capabilities, which is said to open up new possibilities for detailed analysis of practically all of the well-known physiological curves, of the human body. The complex's small dimensions, low weight and relative simplicity of operation make it suitable for use by first-aid services and in agriculture, for example, in rural outpatient clinics and field conditions.

FTD/SNAP

CSO: 1840/1535

FIBRINOLYTIC COMPONENTS IN INDOMETHACIN-TREATED PATIENTS WITH
SALMONELLOSIS

Ashkhabad ZDRAVOOKHRANENIYE TURKMENISTANA in Russian No 2, Feb 84 pp 17-18

MAMAYEVA, L. V., KUZNETSOV, V. A. and CHIRKOVA, L. D., Chair of
Infectious Diseases, Sanitary-Hygienic Faculty and Scientific Research
Laboratory of Problems in Clinical Biochemistry of Tissue Hormones, First
Moscow Medical Institute imeni I. M. Sechenov

[Abstract] An assessment was made of the fibrinolytic system in 70 male and female patients with salmonellosis treated by standard fluid replacement therapy (I), or by combination of fluid replacement and indomethacin (150 mg/day; II). In the acute phase of intoxication statistically significant elevations of plasminogen levels were seen in both groups, concomitantly with depression of plasmin levels. A day after therapy and during convalescence, group II patients presented with normal baseline levels of plasmin. In group I patients, plasmin levels remained depressed a day after treatment but returned to baseline values during convalescence. These observations indicate that fibrinolysis is markedly depressed in the acute phase of gastrointestinal salmonellosis, and that recovery of normal fibrinolytic function is enhanced by indomethacin treatment. References 7: 3 Russian, 4 Western. [1503-12172]

UDC: 613.632:546.18]-07:616.153.1-02:615.835.12+615.916:546.18].015.4:616.153.1

DYNAMICS OF ENZYMOGRAM OF LIVER PROFILE IN PHOSPHORUS PRODUCTION WORKERS AND
PATIENTS WITH CHRONIC PHOSPHORUS INTOXICATION AFTER USE OF HYPERBARIC
OXYGENATION

Moscow GIGIYENA TRUDA I PROFESSIONAL'NYYE ZABOLEVANIYA in Russian No 7,
Jul 84 (manuscript received 5 Jan 84) pp 11-15

BELOSKURSKAYA, G. I. and KOROL'CHUK, Ye. I., Institute of Regional
Pathology, Alma-Ata

[Abstract] Data are presented on the serum effectiveness of 6 liver profile enzymes including organospecific excretory and isoenzymes among phosphorus production workers and persons with varying degrees of chronic phosphorus poisoning. The same enzymes were studied as criteria for effectiveness of the method of hyperbaric oxygenation as a part of the treatment of patients with chronic phosphorus poisoning. Workers who had worked for 5 to 10 years with phosphorus but had no clinical signs of liver damage showed an increase in blood serum activity of organospecific and excretory liver enzymes characteristic of the process of adaption of the organism to the effects of phosphorus. At over 10 years time in service, compensatory reactions were observed, including a decrease in the activity of these enzymes, though the percent content of LDH₄₋₅ was high in both groups. In chronic poison patients the activity of the renal enzymes continues to increase. The use of hyperbaric

oxygenation helps to normalize the activity of these enzymes as a result of elimination of oxygen-reduction process disorders and restoration of the functional capacity of the liver. References 16: 14 Russian, 2 Western, [1626-6508]

CYBERNETICS IN MEDICINE AND UKSSR STATE PRIZE

Kiev RADYANS'KA UKRAYINA in Ukrainian 19 Aug 84 p 2

STOGNIY, A., corresponding member UkSSR Academy of Sciences

[Abstract] In recent years new instrumental and computer technologies entered the field of medicine making it possible to study patients more accurately and to predict and model the course of therapy. A team of scientists under the leadership of the Academician of UkSSR Academy of Sciences M. M. Amonosov introduced new concepts into theoretical and practical aspects of the use of computers in cardiac and vascular surgery, in treatment of respiratory organs and in mass screenings, attempting to win the UkSSR State Prize in Science and Technology. The highly effective diagnostic methods developed for minicomputers give accurate differential diagnoses, provide risk assessments and facilitate prognosis for post-operative periods. The automated diagnostic-prognostic system for lung tumors led to improved treatment efficiency. The use of computers has made it possible to expand and improve prophylactic screening programs with economic efficiency, [838-7813]

UDC: 615.916:548.191].038.17.08.039.72

INTENSIVE THERAPY IN HYDROGEN ARSENIDE POISONING

Moscow ANESTEZIOLOGIYA I REANIMATOLOGIYA in Russian No 4, Jul-Aug 84 pp 46-47

TOGAYBAYEV, A. A., LAPIN, V. I., SHEYNIN, G. D., SULTANBAYEV, B. K. and SHEL', F. G., Department of Anesthesiology and Reanimatology (headed by Professor A. A. Togaybayev), Medical Institute; City Reanimation Center of Clinical Emergency Medical Hospital (Chief Physician G. N. Klimenko), Alma-Ata

[Abstract] Between 1979 and 1982, the clinic treated 10 patients with acute hydrogen arsenide poisoning. All patients were in severe condition upon arrival, brought to the hospital by aircraft on the second or third day of poisoning. Clinical symptoms developed 36 hours after inhalation of the poison. Clinical symptoms are noted. Intensive therapy began immediately upon arrival, consisting of gastric and intestinal lavage, force diuresis

with saluretics and electrolyte, hematocrit and central venous pressure monitoring. All patients received 2 to 3 liter partial blood substitution repeated daily, which achieved good clinical effect, decreasing dyspnea, cyanosis and tachycardia. Hemosorption and hemodialysis were performed as needed. 5% unithiol, 10 ml, qid plus antiprotease preparations were used to prevent acute renal-hepatic insufficiency. A polarizing mixture, 1% solution of glutamic acid, aminon, alvesin were administered by drops. Antioxidants, lipotropics, group B vitamins, vitamin C, cocarboxylase, cardiac glycosides were administered. A 4.2% solution of sodium bicarbonate was used to correct acidosis. Reopolyglutin, hemades and trental were used to improve the rheologic properties of the blood. Prednisolone was administered parenterally at 180-360 mg per day. Hyperbaric oxygenation was used twice per day. Favorable results were achieved in an average of 22 to 28 days, with red blood characteristics normalizing after 35 to 40 days, renal function recovering completely after 2.5 to 3 months. No lethal results were observed. References 3 (Russian).
[1107-6508]

UDC: 615.214.24:547.854.5].099.936.11.085.384

EFFECTIVENESS OF TOTAL BODY WASHOUT IN ACUTE MEDINAL POISONING

Moscow ANESTEZIOLOGIYA I REANIMATOLOGIYA in Russian No 4, Jul-Aug 84
(manuscript received 28 Jun 83) pp 30-32

SAVEL'YEV, O. N., ZINOV'YEV, Yu. V., KOZLOV, S. A. and KISELEV, Ye. N.,
Laboratory of Pathologic Physiology (headed by Yu. V. Zinov'ev), Kirov
Scientific Research Institute of Hematology and Blood Transfusion
(director - Professor V. A. Zhuravlev)

[Abstract] The purpose of this work was to evaluate the effectiveness of TBW in the toxic stage of acute poisoning with long-acting barbituates. Experiments were performed on 21 chinchilla rabbits poisoned with a 37°C aqueous solution of barbital sodium (medinal) administered i/v at 450 mg/kg. In the experimental animals, the vascular bed was washed with plasma substitute solution. An oxygenated solution was infused at 80-100 ml/min, exfused by natural flow from the superior vena cava. Body temperature was maintained at 28°C. Respiration was with pure oxygen at normal barometric pressure. The perfusate consisted of NaCl-141 mmol/l, KCl - 5.36 mmol/l, CaCl₂ - 1.26 mmol/l, MgSO₄ - 0.41 mmol/l, MgCl₂ - 0.49 mmol/l, Na₂HPO₄ - 0.34 mmol/l, NaH₂PO₄ - 0.44 mmol/l, glucose 20 g, polyglucin 60 g, double distilled water to 1 l, pH 7.45. Eight times the total circulating blood volume was used, after which the animals received fresh heparinized donor blood, were warmed up, transferred to oxygen respiration and the heparin neutralized with 1% protamine sulfate solution. The 9 rabbits which did not receive treatment died, the 12 which did survived. Perfusion of 11.6 ± 0.8 minutes achieved total washout of all blood from the vascular bed. Figure 1; references 17: 15 Russian, 2 Western.
[1107-6508]

BRIEFS

CEMA MEDICAL CONFERENCE--Cooperation in the construction of radio-diagnostic equipment for various fields of medicine was the main theme of a conference of experts from CEMA member nations which opened in Baku on September 18. In opening the conference, Deputy Minister of Health of the Azerbaijan SSR G. Z. Aliyev warmly welcomed the visitors and wished them success in their work. Then, under the chairmanship of the Soviet delegation's head, E. B. Kozlovskiy (All-Union Scientific-Research and Experimental Institute of Medical Technology), the conference participants began their discussion about the progress being made in the fulfillment of the agreement between the Bulgarian People's Republic, the Hungarian People's Republic, the GDR, Poland, Romania, the USSR, and the CSSR, and subsequently joined by the Republic of Cuba, on the manufacture of biomedical instruments and apparatus for clinical medicine. Information on this problem and papers on the contemporary status of medical technological development in radio-diagnostics were presented by representatives of the USSR, Hungary, and the CSSR. The experts, among whom were engineers who are building new apparatus, and physicians who are using the new equipment in practice, noted that medical technology production in the socialist countries received a powerful impetus following the 1971 signing of the agreement on cooperation. Public health has been placed on a contemporary technological base which has made it possible to improve mass-medical services for workers and improve the quality of diagnostics and treatment. Integration has made it possible to reduce the expenditure of material and labor resources in the construction of medical apparatus based on the latest scientific and technological achievements. The conference will last until September 21. [Text]
[Baku BAKINSKIY RABOCHIY in Russian 19 Sep 84 p 3] 6289

BAKU MEDICAL EXHIBIT--It was a pleasure to share the pride of the director of the exhibit's Soviet pavillion, Alika Kyazimovicha Tomayeva, who demonstrated to the foreign specialists and visitors, for example, a diagnostic device for immunological research which employs a laser, or an apparatus for suturing live tissue which makes it possible to apply staples with a high degree of precision, speed, and reliability (to the point of hermetic sealing) even in those areas inaccessible to the surgeon's hand. It is no accident that manufacturing licenses for those instruments have already been purchased in Japan, the USA, and the FRG. Also of interest to the medical specialists is a compact (total weight is only 50 kilograms)

portable barochamber which can operate independently for about one and a half hours at the bottom of a mine or on a high mountain plateau. The visitors spent a long time becoming acquainted with a device for pulse magnetotherapy, the Alimp-1. This apparatus, equipped with extension attachments, makes it possible to treat cardiovascular system diseases, including hypertension, by a "travelling" magnetic field. The apparatus is the only one of its kind. Two inventor's certificates protect the priority rights of the Soviet designers. [By Dm. Guseynov] [Excerpt][Baku BAKINSKIY RABOCHIY in Russian 22 Sep 84 p 2] 6289

CSO: 1840/1534

MICROBIOLOGY

UDC: 582.282.123:579.24

MORPHOFUNCTIONAL SPECIFICS OF DEVELOPMENT OF STRAINS OF FUSIDIUM COCCINEUM
DIFFERING IN ANTIBIOTIC ACTIVITY WITH DEEP CULTIVATION

Moscow MIKROBIOLOGIYA in Russian Vol 53, No 2, Mar-Apr 84
(manuscript received 24 Sep 82) pp 266-270

BARTOSHEVITS, Yu. E. and ZASLAVSKAYA, P. L., All-Union Scientific Research
Institute of Antibiotics

[Abstract] An electron microscope study was undertaken of three strains of the fungus fusidium coccineum, the producer of fusidine, in the process of deep cultivation. Strain A was a low activity strain, activity 1 arbitrary unit; strain E was a highly active strain, AA = 10 units, strain A was a polyene-resistant highly active strain, AA = 15 units. The cultures were grown in a combined fermentation medium in erlenmeyer 750 ml flasks at 28° for 168 hours with rocking. The comparative morphofunctional study showed major structural changes in the culture and determined a tendency in the direction of metabolic processes with intensification of fusidine synthesis. During development of highly active strains it is found that the electron-dense structures in the vegetative cell cultures are transformed to lipid granules and membrane phospholipid concentric structures. In low activity strains the electron-dense structures are mainly restricted to spores and undergo destruction with formation of vacuoles. The electron-dense structures may act as energy accumulators which can be easily mobilized for various biosynthetic processes. Figures 5; references 20: 16 Russian, 4 Western.
[808-6508]

EXPRESSION OF RP4 PLASMID RESISTANCE GENES IN CELLS OF ESCHERICHIA COLI GROWN UNDER CONTINUOUS CULTIVATION CONDITIONS

Moscow MIKROBIOLOGIYA in Russian Vol 53, No 2, Mar-Apr 84
(manuscript received 28 Jul 83) pp 285-289

FILONOV, A. Ye., KOZLOVA, Ye. V. and BORONIN, A. M., Institute of Biochemistry and Physiology of Microorganisms, USSR Academy of Sciences

[Abstract] A study is presented of the stability of the RP4 and pBS94 resistance plasmids in the cells of Escherichia coli C600, of the influence of cultivation conditions and genetic environment on the level of plasmid-determined medication resistance of the bacteria. The stability of the plasmids RP4 and pBS94 was studied in continuous cultivation of E. coli for 100 generations in a pH-static cultivator and under conditions of glucose-limited growth in a chemostat. Under continuous cultivation conditions the decrease in level of resistance to tetracycline is most clearly expressed in the glucose-limited chemostat culture of E. coli, but is also observed in pH-static cultures, more so for E. coli with both plasmids than for E. coli containing only RP4. The level of tetracycline resistance controlled by the RP4 plasmid may therefore depend on the host strain, the presence of the other plasmid, cultivation conditions, particularly type of medium, concentration of glucose in the medium, conditions (chemostat, pH-state, periodic culture) and duration of cultivation of the plasmid-containing bacteria. Figures 5; references 16: 4 Russian, 12 Western.
[808-6508]

UDC: 579.846.2.017.7:550.72(547.4)

PROPAGATION AND ACTIVITY OF MICROORGANISMS DURING LEACHING OF NONFERROUS METALS AT NIKOLAYEVO DEPOSIT

Moscow MIKROBIOLOGIYA in Russian Vol 53, No 2, Mar-Apr 84
(manuscript received 21 Dec 82) pp 329-335

KARAVAYKO, G. I., KHALEZOV, B. D., ABAKUMOV, V. V., GOLOVACHEVA, R. S., KOVALENKO, T. V., PISKUNOV, V. P. and SKRIPCHENKO, L. N., Institute of Microbiology, USSR Academy of Sciences; Urals Scientific Research and Planning Institute of the Copper Industry

[Abstract] The purpose of this work was to study the geochemical activity of T. ferrooxidans, L. ferrooxidans and S. thermosulfidooxidans in industrial installations and tailings with variable environmental conditions. Studies were performed in June of 1979. Quantitative bacteria assays were performed in June of 1979. Quantitative bacteria assays were performed by limiting 10-times dilutions. The pH and Eh were determined potentiometrically, lower and higher oxides of iron complexometrically with trilon B. Bacterial activity was determined from fixation of $^{14}\text{CO}_2$. The studies indicate that in ores and

solutions at this mine, mesophilic and thermophilic bacteria oxidizing sulfur, the lower oxide of iron and sulfide minerals are present but their quantity is insufficient to support rapid oxidation. The studies show that the conditions in the leaching system are not optimal for the vital activity of the bacteria. Regeneration of leaching solutions is necessary to optimize the conditions for bacteria not only by decreasing the metal ion content, but also by creating nonequilibrium conditions in the solution-ore system. Figures 4; references 13: 12 Russian, 1 Western.
[808-6508]

UDC: 579.811.12:577.152.1

GROWTH AND SYNTHESIS OF RHODOPSEUDOMONAS CAPSULATA HYDROGENASE IN CONTINUOUS CULTIVATION

Moscow MIKROBIOLOGIYA in Russian Vol 53, No 3, May-Jun 84
(manuscript received 24 Jan 83) pp 392-398

TSYGANKOV, A. A., GOGOTOV, I. N. and KONDRAT'YEVA, Ye. N., Institute of Soil Science and Photosynthesis, USSR Academy of Sciences; Moscow State University imeni M. V. Lomonosov

[Abstract] The purpose of this work was to determine the influence of light intensity, molecular hydrogen and lactate on the growth and synthesis of hydrogenase by the purple bacterium *Rhodopseudomonas capsulata* when grown under continuous conditions. *Rhodopseudomonas capsulata* B10 was grown on Ormerod's medium with thiamine (2.5 mg/l) in an installation for continuous cultivation of phototropic microorganisms. Cultures were grown in the presence of lactate and CO₂, and also with H₂ and CO₂ present. The source of nitrogen was (NH₄)₂SO₄ or N₂. The studies performed confirmed that the synthesis of hydrogenase by this culture is repressed by lactate regardless of whether it is limited by the light source or not. Growth limitation by lactate causes a great increase in hydrogenase activity, which may reach the same level as in cultures grown in the presence of H₂ under autotrophic conditions. A still greater increase in hydrogenase activity is possible if the culture is grown in mixotrophic conditions with a limitation in culture growth by both lactate and molecular hydrogen. Figure 1; references 20: 9 Russian, 11 Western.
[810-6508]

INFLUENCE OF SUBSTRATE CONCENTRATION ON GROWTH OF CONTINUOUS DEBARYOMYCES FORMICARIUS CULTURE

Moscow MIKROBIOLOGIYA in Russian Vol 53, No 3, May-Jun 84
(manuscript received 23 Nov 82) pp 404-411

PANIKOV, N. S., Moscow State University imeni M. V. Lomonosov

[Abstract] An experimental study is presented of continuous growth of microorganisms, using a chemostatic culture *Debaryomyces formicarius* with subsequent development of a kinetic model considering the D-dependent change in properties of the microbe population. The method of acute experiments was used to check the theoretical assumptions. The culture of *D. formicarius* yeast was grown in a chemostat on a synthetic medium with glucose 200 mg/l as the limiting substrate. The quantity of microbe biomass was measured by a gravimetric method on membrane filters at each tested value of D after a steady state was achieved. The respiration intensity of the chemostatic culture was determined directly in the fermenter with a sterilized autoclaved low-inertia modified Clark electrode and in the acute experiments after introduction to the culture of various quantities of glucose. It is assumed that the concentration of the limiting factor determines not only growth rate but also the content of active enzyme centers in the cells, forming the limiting stage in metabolism of the limiting factor. Figures 6; references 15: 6 Russian, 9 Western.
[810-6508]

CALCULATION OF LIMITING ECONOMIC CHARACTERISTICS OF GROWTH AND EXCRETION OF MONOMERS IN A BACTERIAL CULTURE

Moscow MIKROBIOLOGIYA in Russian Vol 53, No 3, May-Jun 84
(manuscript received 26 Jul 82) pp 412-418

SKURIDA, G. I., MIRONOV, V. A. and DROZDOV-TIKHOMIROV, L. N., All Union Scientific Research Institute of Genetics and Selection of Industrial Microorganisms, Moscow

[Abstract] A universal method is suggested for calculating the maximum economic characteristics of a cell. The method can be implemented as a computer algorithm. The method for the first time formalizes the solution of the problem of theoretical calculation of the material and energy balance of formation of a biomass or monomer product of microbiological synthesis. The method is based on detailed consideration of the stoichiometry of all processes involved in the synthesis of cell biomass. Representation of the necessary initial information in the form of characteristic tables and writing of intermediate and final results as functions of these tables make

the method convenient for computer implementation. The approach to solution of the problem and therefore the resulting equations is universal since they are not related to any specific cell metabolic system or biochemical composition. References 11: 8 Russian, 3 Western.
[810-6508]

UDC: 5582.282.23.017.7-579.24

EMULSIFYING ACTIVITY OF YEAST DURING GROWTH ON NORMAL ALKANES

Moscow MIKROBIOLOGIYA in Russian Vol 53, No 3, May-Jun 84
(manuscript received 24 Jan 83) pp 423-426

ILLARIONOVA, V. I., SHISHKANOVA, N. V., KHAIFERBURG, D. and FINOGENOVA, T. V.,
Institute of Biochemistry and Physiology of Microorganisms, USSR Academy of
Sciences, Pushchino

[Abstract] A study is presented of the capability of yeast organisms to emulsify hydrocarbons used as a carbon source for growth. A culture with high emulsifying activity was selected and substances causing the emulsification of alkane were isolated. Ten strains of *Candida lipolytica* were used in a medium containing two per cent n-hexadecane by volume. The yeasts were grown at 28-30° C in 750 ml flasks with 100 ml of the medium and in fermentation apparatus with a volume of 5 liters and a concentration of dissolved oxygen of 70-75% of saturation. The pH was maintained at 6.0. The emulsifier was separated by flotation and ether extract was obtained by extracting the culture fluid after the cells were removed for twenty-four hours. The strains of *C. lipolytica* studied did emulsify the hexadecane. The degree of emulsification varied from strain to strain. The greatest emulsifying activity was found in the stage of slowed growth of the cultures. The substances responsible for emulsifying the alkane were isolated. Figures 2; references 20: 3 Russian, 17 Western.
[810-6508]

UDC: 579.851.11.012.4:550.72

FINE STRUCTURE OF METHANE-FORMING BACTERIA LIBERATED IN A PETROLEUM DEPOSIT

Moscow MIKROBIOLOGIYA in Russian Vol 53, No 3, May-Jun 84
(manuscript received 17 Jan 83) pp 463-465

OBRAZTSOVA, A. Ya., RATNER, Ye. N., GELYAYEV, S. S. and IVANOV, M. V.,
Institute of Biochemistry and Physiology of Microorganisms, USSR Academy
of Sciences, Pushchino

[Abstract] A study is presented of the fine structure of the following microorganisms: *Methanobacterium* sp. strain 26, similar to *Methanobacterium*

bryantii; Methanobacterium sp. strain 31, also similar to M. bryantii; Methanobacterium sp. strain 41, similar to Methanobacterium formicicum. The methane-forming bacteria were isolated from an oil deposit in the Tatar ASSR. M. bryantii strain 26 was isolated from fresh water in an injection well; M. bryantii strain 31 from a core of a productive well taken from 1675-1676 M depth; M. formicicum strain 41 from a slightly mineralized stratal fluid in an operating well. Ultrafine sections were produced by an LKB-3 ultratome. A uranyl acetate contrast solution was used, with subsequent processing by lead citrate. Preparations were examined in a JEM-100V electron microscope. The electron microscope showed the bacteria to be similar in submicroscopic organization to previously described species, Methanobacterium bryantii MOH and Methanobacterium formicicum MF. Additional characteristics noted concerned primarily the structure of the cell wall. Figures 10; references 14: 4 Russian, 10 Western.
[810-6508]

UDC: 579.69:55

ROLE OF MARINE BACTERIA IN LEACHING OF COPPER FROM KhV-5153 ANTIFOULING COATING

Moscow MIKROBIOLOGIYA in Russian Vol 46, No 4, Jul-Aug 84
(manuscript received 24 Feb 83) pp 3-6

ANDREYUK, Ye. I., KOPTEVA, Zh. P., YANOVER, S. B., ZANINA, V. V.,
KOPTEVA, A. Ye. and PETROV, V. G., Institute of Microbiology and Virology,
Ukrainian SSR Academy of Sciences, Kiev

[Abstract] A study is presented of the influence of associative and individual cultures of bacteria isolated from the surfaces of metals, that had been painted and exposed in the sea on the rate of leaching of copper from KhV-5153 antifouling paint. The influence of associative and individual cultures of Bacterium agile and Micrococcus boreus on the rate of leaching of copper from the paint was studied in artificial sea water. The data showed that at the beginning of the experiment the nature of the change in rate of leaching of the copper in the presence of monocultures and in the control was similar. After 3 months there was a constant and uniform liberation of copper into the water in the version with M. boreus. The leaching of copper from the coatings in the presence of bacteria in native sea water was greater than in the control. Thus, the results indicate a positive role of bacteria in the leaching of copper from the antifouling paint. The bacteria facilitate stable liberation of the toxin in both natural and artificial sea water. Figures 3; references 11: 10 Russian, 1 Western.
[814-6508]

MICROFLORA IN PETROLEUM-CONTAMINATED SOIL

Moscow MIKROBIOLOGIYA in Russian Vol 46, No 4, Jul-Aug 84
(manuscript received 31 Jan 83) pp 29032

RYBAK, V. K., OVCHAROVA, Ye. P. and KOVAL', E. Z., Ukrainian Scientific Research Institute of Agricultural Microbiology, Chernigov; Institute of Microbiology and Virology, Ukrainian SSR Academy of Sciences, Kiev

[Abstract] Field model, vegetation and laboratory experiments were performed to determine the microorganisms oxidizing petroleum in petroleum-contaminated soils, to seek means of neutralizing petroleum hydrocarbons in soils by means of fungi and to determine the influence of petroleum on the vital activity of certain groups of soil microflora. It was found that petroleum-oxidizing fungi are present in soils contaminated with petroleum hydrocarbons. The authors isolated 96 cultures of fungi growing in media with petroleum and hexadecane. The laboratory experiment determined the possibility of growth of fungi in sterile soil containing petroleum. The results of quantitative counting of the major groups of microorganisms in vegetation and field experiments showed that when petroleum is added to soil there is an increase in the population of bacteria growing on the meat-peptone broth and fungi growing on wort agar but a simultaneous significant decrease in the number of actinomycetes. The hydrocarbons of petroleum can serve as a source of nutrition for ammonifying bacteria and fungi. The quantity of actinomycetes in soil can to some extent serve as an indicator of the degree of contamination of the soil with petroleum. References 5 (Russian). [814-6508]

UDC: 577.11:663.1:664.314

MICROORGANISMS AS POTENTIAL PRODUCERS OF ESSENTIAL FATTY ACIDS

Moscow BIOLOGICHESKIYE NAUKI in Russian No 2, Feb 84
(manuscript received 12 May 82) pp 5-16

DEDYUKHINA, E. G. and YEROSHIN, V. K.

[Abstract] This review of the literature discusses the significance of essential fatty acids in a balanced diet and methods of their synthesis in microorganisms. The selection of microorganisms as producers of lipids is based on the requirements of lipid composition in terms of fatty acids for use as food or feed. In selecting microorganisms to produce lipids for these purposes it is not only the total quantity of lipids synthesized but the content of the polyunsaturated fatty acids which must be considered. A high content of α -linoleic acid in microbe lipids is reported to be undesirable. Graphs compare the content of lipids and linoleic acid in microorganisms. (Report recommended by Institute of Biochemistry and Physiology of Microorganisms, USSR Academy of Sciences). Figures 6; references 61: 28 Russian, 33 Western, [875-6508]

GENOSES OF METHANE-FORMING BACTERIA FROM APSHERON OIL STRATA

Moscow MIKROBIOLOGIYA in Russian Vol 53, No 1, Jan-Feb 84
(manuscript received 22 Nov 82) pp 149-155

NAZINA, T. N., Institute of Microbiology, USSR Academy of Sciences

[Abstract] A study is presented of the composition of methane-forming associations isolated from Apsheron petroleum formations. Cultures of methane-forming bacteria were obtained by inoculating a culture medium with water from oil-bearing strata in Apsheron. H_2+CO_2 , formate, acetate, methanol and ethanol were used as substrates. Cell morphology as seen under a luminescent microscope was used for approximate determination of the methane-forming bacteria. Methane was determined by gas chromatography. The influence of ecologic factors on the formation of methane associations from petroleum seams was studied. Significant variety was demonstrated in methane-forming bacteria. The studies showed that the oil deposits of Apsheron are populated by *Methanobacterium*, *Methanosarcina* and *Methanothrix* species. A correlation was observed between the optimum of methane formation and the spectrum of ecologic conditions in the strata from which the organisms were taken. The maximum of methane formation was observed at 50-70 mg H_2S/l and 0.17-0.34 M NaCl. Marine bacteria of the genus *Methogenium*, as well as *Methanobacterium bryantii* have been found to be capable of developing at elevated salinity. Salt tolerances are probably more widespread among methane forming bacteria than was previously thought. Figures 5; references 20: 11 Russian, 9 Western.
[809-6508]

UDC: 550.72:579.695

MICROBIOLOGIC INTENSIFICATION OF OXIDATION OF PETROLEUM IN BIOFILTERS

Moscow MIKROBIOLOGIYA in Russian Vol 53, No 1, Jan-Feb 84
(manuscript received 10 Oct 82) pp 156-160

GASANOV, M. V., AMIROVA, S. M., KIRILLOVA, L. M., ZABIROVA, R. M. and RUKAVISHNIKOVA, L. A., Baku Branch, All-Union Scientific Research Institute of Water Supply, Sewage, Water Engineering Structures and Engineering Hydrogeology

[Abstract] A study was made of one method of intensification of the process of purification of city sewage, containing up to 40% industrial effluent polluted by petroleum, in a biological air filter by introduction of a mixture of hydrocarbon-oxidizing microorganism cultures. The following microorganisms were isolated from petroleum-bearing soils in Azerbaijan: *Pseudomonas liquefaciens*, *P. desmoliticum*, *P. aeruginosa* and *Mycobacterium*

lacticolum. Their ability to oxidize the hydrocarbons of petroleum was tested in individual cultures and in a mixture of two cultures (*M. lacticolum* and *P. aeruginosa*). The biomass of the cultures studied was determined during the course of the experiment. It was found that after the quantity of petroleum pollution was reduced, the biomass of the cultures the oxidation also decreased. *P. aeruginosa* was found to oxidize petroleum more rapidly than *M. lacticolum*. Studies on a pilot-scale, heavily-loaded biofilter indicated that hydrocarbon oxidizing, ammonifying, nitrifying, denitrifying, sulfate-reducing, cellulose-reducing, butyric acid and thionate bacteria accumulated in the biological film of the filters. The hydrocarbon-oxidizing species were dominant. The use of the mixture of the microorganisms for artificial biological purification of hydrocarbon-containing waste waters intensifies the process of biochemical oxidation of sewage containing petroleum organic matter, improving the quality of the fluid produced. Figures 2; references 8 (Russian).
[809-6508]

UDC 615.332(Levorinum)].012.6:[579.873.71:579.222

EFFECTS OF CANDIDA BIOPRODUCTS ON LEVORIN, LEVORISTATIN AND FATTY
IN STREPTOMYCES LEVORIS CULTURE

Moscow ANTIBIOTIKI in Russian Vol 29, No 7, Jul 84
(manuscript received 1 Feb 84) pp 483-487

KUZNETSOVA, O. S., YAKOVLEVA, Ye. P., YEFIMOVA, T. P. and TSYGANOV, V. A.,
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[Abstract] *Candida tropicalis* 159 was added as a 1% powdered preparation to a soya-corn medium used for the cultivation of *Streptomyces levoris* 28, to test its effects on the synthesis of levorin, levoristatin and a variety of fatty acids. The presence of biostimulants produced by *Candida* in the medium resulted in a 50-60% increase in the synthesis of levorin by *S. levoris*. The fact that, in addition to stimulation of levorin biosynthesis, the synthesis of levoristatin and fatty acids was also enhanced indicates that the stimulants acted in a nonspecific fashion and affected common metabolic pathways. Evaluation of unsaturated fatty acid (linoleic, oleic) dynamics showed their enhanced accumulation during the first 24 h of fermentation in the presence of *C. tropicalis*, exceeding the levels in control cultures almost three-fold. Thereafter, the concentration of the unsaturated fatty acids in *S. levoris* mycelium underwent a sharp decrease in the experimental cultures, whereas in the control cultures the concentration of the unsaturated fatty acids remained virtually constant. Figures 2; references 15: 2 Polish, 10 Russian, 3 Western.
[1529-12172]

REGENERATION OF NOCARDIA ORIENTALIS PROTOPLASTS

Moscow ANTIBIOTIKI in Russian Vol 29, No 7, Jul 84
(manuscript received 8 Feb 84) pp 495-500

TRENIN, A. S. and DUDNYK, Yu. V., All-Union Scientific Research Institute for the Isolation of New Antibiotics, USSR Academy of Medical Sciences, Moscow

[Abstract] *Nocardia orientalis* ATCC19795 protoplasts were employed in a study designed to evaluate the effects of BAS (bovine serum albumin) on the regeneration of intact cells under defined conditions. Using an agar-overlay approach, in which protoplasts in enriched hypertonic R-I medium were covered by R-II medium with 0.67% agar content, a 50-60% recovery of intact forms was obtained if R-I was 2.5-5.0% dehydrated. Addition of BSA enhanced reversal to the intact form, with 100% reversal obtained with BSA in a concentration of 0.01%. Figures 3; references 18: 5 Russian, 13 Western. [1529-12172]

UDC 615.281;547.295].015.44:579.8

MECHANISM OF ACTION OF ECTERICIDE ON OPPORTUNISTIC PATHOGENS

Moscow ANTIBIOTIKI in Russian Vol 29, No 7, Jul 84
(manuscript received 2 Dec 83) pp 510-512

DIKIY, I. L., DIKAYA, Ye. M., CHERKAS, G. P. and BAZAVLUK, A. D., Scientific Research Institute of Microbiology, Vaccines and Sera imeni I. I. Mechnikov, Kijarkov

[Abstract] Ectericide, an oxidation product of cod liver oil consisting of lower fatty acids, aldehydes and organic peroxides, was tested for its effects on the chemical composition of *Staphylococcus aureus* and *Proteus mirabilis*. Exposure of the bacterial cells to ectericide for 24 h resulted in a decrease in the LPS (lipopolysaccharides) content of *S. aureus* 256 by 29.57% and in *P. mirabilis* 1211 by 26.39%, with a corresponding decrease in total polysaccharide of 11.05 and 32.05%, respectively. Ectericide had no statistically significant effect on the bacterial levels of proteins or nucleotides. It appears that the antibacterial effects of ectericide are due to structural disruptions in the opportunistic bacterial pathogens under study. References 11 (Russian). [1529-12172]

ANTIBIOTIC RESISTANCE OF MICROBIAL FLORA ISOLATED FROM SURGICAL PATIENTS
WITH PURULENT COMPLICATIONS

Moscow ANTIBIOTIKI in Russian Vol 29, No 7, Jul 84
(manuscript received 14 Jul 83) pp 532-535

DAVYDOVA, N. V., RYABTSEV, V. G., MATVEYEVA, Ye. A., POGOZHEVA, Ye. Ye.
and DRATVIN, S. A., First Moscow Medical Institute imeni I. M. Sechenov

[Abstract] Studies were conducted on the antibiotic resistance of microbial flora isolated from 44 surgical patients with purulent complications. In the majority of cases (64.8%) a monoculture was identified as the causative organism, with 77.3% of such cases due to Gram positive bacteria (*Staphylococcus aureus*, *S. epidermidis*, rods). The Gram negative microbes were represented by six species, of which *Pseudomonas aeruginosa* predominated (36.4% of cases). Multiple drug resistant was rule, with gentamicin presenting as the most effective aminoglycoside. Of the penicillin antibiotics the most effective congener was carbenicillin. References 6: 3 Russian, 3 Western, [1529-12172]

UDC 579.841.11:579.252.55

R PLASMIDS OF *PSEUDOMONAS AERUGINOSA*

Moscow ANTIBIOTIKI in Russian Vol 29, No 9, Sep 84
(manuscript received 17 Feb 84) pp 678-695

BORONIN, A. M. and ANISIMOVA, L. A., Institute of Biochemistry and
Physiology of Microorganisms, USSR Academy of Sciences, Pushchino

[Abstract] A review is presented of essentially Western literature on the R factors of *Pseudomonas aeruginosa*, in relation to the fact that this pathogenic agent is one of the more important etiologic agents of nosocomial infections. It is currently estimated that more than 90% of the *Ps. aeruginosa* isolates in the USA, USSR and Japan carry such multiple resistance factors. The review covers classification and delineates the compatibility groups of the R factors, and the biochemical mechanisms by which these plasmids impart antibiotic resistance. In addition, coverage is also accorded to the molecular biology, genetics, and evolution of the R factors. References 126: 10 Russian, 116 Western, [1530-12172]

NUTRIENT REQUIREMENTS OF FRANCISELLA TULARENSIS

Moscow ZHURNAL MIKROBIOLOGII EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 6, Jun 84 (manuscript received 5 May 83) pp 20-23

MAYSKIY, V. G., SHISHOV, I. N. and BASILOVA, G. I., Scientific Research Antiplague Institute of the Caucasus and Transcaucasus, Stravopol'

[Abstract] The purpose of this work was to study the nutrient requirements of *F. tularensis* and develop, on the basis of the results of this study, a synthetic nutrient medium for this microorganism. A vaccine strain of *F. tularensis*, 15 gayskogo, was used. The inoculation material was a 48 hour culture of *F. tularensis* grown on blood glucose cysteine agar. The results of the studies were processed by variational statistics, revealing that growth of the bacteria requires the amino acids arginine, cysteine, histidine, isoleucine, leucine, lysine, methionine, proline, threonine, tyrosine, valine, plus calcium pantothenate, thiamine, and magnesium ion. A minimal synthetic nutrient medium providing for growth of known subspecies of the pathogen was developed to meet these requirements. References 9: 6 Russian, 3 Western. [1591-6508]

UDC: 579.842.083.13

USE OF SUBSTANCES STIMULATING GROWTH OF ENTEROBACTERIA IN PRODUCTION OF MICROBIAL ADSORBENTS

Moscow ZHURNAL MIKROBIOLOGII EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 6, Jun 84 (manuscript received 14 Sep 83) pp 47-50

GOLSHMID, V. K., BOGOSLOVSKAYA, L. N., LANDSMAN, N. M. and TOKINOVA, T. N., Central Scientific Research Institute of Vaccines and Sera imeni I. I. Mechnikov, Moscow

[Abstract] Production of highly specific diagnostic preparations for identification of enterobacteria requires microbial adsorption, which in turn requires nutrient media allowing sufficient accumulation of bacterial mass while retaining the antigen structure of the microbe. The purpose of this article was selection of stimulants which can provide for accumulation of bacterial mass on a nutrient medium of the clotted blood of laboratory animals in quantities no less than on meat nutrient media. A 3% agar nutrient medium based on tryptic hydrolysate of rabbit, guinea pig and sheep blood containing 170 mg% amine nitrogen was used, with the addition of a number of stimulant substances. Sodium hyposulfite and sodium sulfate reducing agents, the vitamin preparation EKD, polyatomic alcohol of glycerine [sic] and ion exchange resin AV-17-8 are found to stimulate the growth of the enterobacteria. The addition of this combination of substances to nutrient media stimulates the growth of *Escherichia* and *Proteus*. References 13: 12 Russian, 1 Western. [1591-6508]

UDC: 579.842.11:579.222:577.152.27].083.13

GROWTH AND BIOENERGETIC CHARACTERISTICS OF RESTRICTION ENDONUCLEASE
PRODUCER E CO CK IN PERIODIC CULTIVATION

Moscow ZHURNAL MIKROBIOLOGII EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian
No 6, Jun 84 (manuscript received 21 Jun 83) pp 50-55

GRUBER, I. M., NIKOL'SHAYA, I. I., UPOROVA, T. M. and NISILEVICH, V. F.,
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Medical Sciences, Moscow

[Abstract] A study was made of the yield and activity of a host specificity
system enzyme--the restricting endonucleases E. coli CK--under various
cultivation conditions and the dynamics of the process in comparison to the
physiological, energetic and economic parameters of growth. The growth
process can be regulated by varying such parameters as temperature, pH and
partial pressure of oxygen. The possibility is shown of using multicycle
cultivation to grow E. coli CK. The time from the period of maximum specific
growth rate to the end of the exponential growth phase and beginning of the
steady phase is the optimal time for isolation of the restriction endonuclease
from the culture, most active and least contaminated with other endonucleases.
The possibility is shown of using thermodynamic characteristics calculated
from r_{H_2} and characterizing the energy of growth to estimate the effectiveness
of the process of controlling periodic cultivation. Figure 1; references 14:
9 Russian, 5 Western.
[1591-6508]

UDC: 579.852.11.083.13

NUTRIENT REQUIREMENTS OF STRAINS OF BACILLUS ANTHRACIS AND SPECIFICS OF GROWTH
OF STRAIN STI-1 IN PERIODIC CULTIVATION ON LIQUID SYNTHETIC MEDIA

Moscow ZHURNAL MIKROBIOLOGII EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 6,
Jun 84 (manuscript received 10 Sep 83) pp 55-59

NAYMANOV, P. I., GALUBINSKIY, Ye. P. and SORKIN, Yu. I.

[Abstract] A study is presented of field strains of B. anthracis in terms of
nutrient requirements and specifics of the growth of a periodic culture of
strain STI-1 in a liquid synthetic medium. The synthetic medium has low
content of inorganic components. Of 23 strains studied, the nutrient require-
ments of 20 were satisfied by a single amino acid--valine--at 50 $\mu\text{g/ml}$ and
thiamine at 10 $\mu\text{g/ml}$. Of the remaining strains, one was tryptophan dependent,
the others required that valine and triptophan and valine and threonine be
present. Glucose as a primary source of energy yields the effect of sub-
strate limitation and inhibition. Specific growth rate increased in pro-
portion to the increase in concentration of nitrogen source in the medium.
Pyruvate and gluconate are substrates which are more easily utilized than
glucose. Figures 4; references 10: 6 Russian, 4 Western.
[1591-6508]

DRY ESCHERICHIA DIAGNOSTIC PREPARATIONS FROM LIVE CULTURES

Moscow ZHURNAL MIKROBIOLOGII EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 6, Jun 84 (manuscript received 10 Sep 83) pp 59-61

GROSHEV, A. G., BOGOSLOVSKAYA, L. N., LANDSMAN, N. M. and NADEZHDINA, L. A.

[Abstract] A study was made of the stabilizing effect of drying of live *Escherichia* cultures in order to improve methods of preparation of *Escherichia* diagnostic preparations and standardize testing of specific activity of agglutinating sera. In studying the survival rate of microorganisms upon lyophilization it was established that the number of surviving cells is 43 to 47%. When placed in dense nutrient media, subcultures are produced in smoothed form, equal in reproduction capacity to the initial cultures. The agglutinability of the dried cultures is equal to that of fresh suspensions of *Escherichia* cultures. Dry *Escherichia* diagnostic materials made from living cultures do not lose their agglutinability over a period of 2 months storage at 37°C, 12 months at a temperature of 18-20 or 4°C.
[1591-6508]

UDC: 579.841.11.68

SURVIVAL AND ADAPTATION OF CERTAIN STRAINS OF GENUS *PSEUDOMONAS* IN SEA WATER AND RIVER WATER

Kiev MIKROBIOLOGICHESKIY ZHURNAL in Russian Vol 45, No 6, Nov-Dec 83 (manuscript received 8 Jun 82) pp 16-20

ALTON, L. V., Institute of Experimental Biology, Estonian SSR Academy of Sciences, Tallin

[Abstract] A study is made of the capability of *Pseudomonas fluorescens*, *P. aeruginosa* and *P. dentrificans* to survive and adapt to sea water and river water at temperatures ranging from 18-20 to -12°C. The objects of the study were 5 strains of each species. In the first portion of the experiment it was established at what temperatures the strain of *P. fluorescens*, *P. dentrificans* and *P. aeruginosa* would develop on meat-peptone broth and agarized river and sea water. In the second stage laboratory experiments determined the survival rate and adaptation of the microorganisms in sea water and river water. It was found that all types of *Pseudomonas* tested could develop on meat-peptone broth at 4-28°C. In agarized river and sea water, *P. aeruginosa* developed at 4-20°C, *P. dentrificans* at 8-20°C. *P. fluorescens* was capable of adapting to growth in sea water and river water only with much more difficulty than the representatives of the other two species. This confirms the hypothesis that certain species of bacteria can adapt to reproduction at sea. References 5: 4 Russian, 1 Western.
[806-6508]

BIORESISTANCE OF POLYMERS BASED ON POLYVINYL ALCOHOL

Kiev MIKROBIOLOGICHESKIY ZHURNAL in Russian Vol 45, No 6, Nov-Dec 83

(manuscript received 26 Apr 82) pp 20-24

SHTEYNBERG, B. I., TRAKHTENBERG, S. I., DATSYUK, N. F., KOVALYUK, Ye. K.,
GURA, I. S. and SHAKH, Ye. S., L'vov State University, L'vov Polytechnic
Institute

[Abstract] A study is made of the resistance of thermally-stable film materials based on polyvinyl alcohol and methacrylate with ammonium persulfate as polymerization initiator to microorganisms. The resistance of the copolymers to microorganisms was studied at 20 and 29°C without introduction of exogenous microflora, and also with the introduction of bacterial and fungus airborne microflora. The copolymerizates stored without additional microflora at 20 and 29°C for 1 year showed no visible changes, retaining their physical and mechanical properties. The polymerizates remained practically sterile throughout the year of study. Study of polymers to which bacteria were added showed that the condition varied as a function of the quantitative content of the component. Microbial resistance depended on two factors - the relationship of polyvinyl alcohol and methacrylate and the quantity of ammonium persulfate added. Increasing the percent content of ammonium persulfate resulted in an increase in microbiological resistance of the polymers. Increasing the polymer content of methacrylate allowed the production of microbiologically resistant copolymers with a smaller quantity of ammonium persulfate. More than 1% ammonium persulfate yielded elevated microbial resistance in specimens with high content of methacrylate. Figures 4; references 5: 4 Russian, 1 Western.

[806-6508]

INFLUENCE OF CERTAIN COMPONENTS OF ANTIFOULING COATINGS ON MARINE BACTERIAL GROWTH

Kiev MIKROBIOLOGICHESKIY ZHURNAL in Russian Vol 45, No 6, Nov-Dec 83

(manuscript received 14 Jan 83) pp 92-93

KOPIEVA, Zh. P., YANOVER, S. B., KOPIEVA, A. Ye., ZANINA, V. V.,
NAUMENKO, N. F. and ZVYAGINTSEVA, N. P., Institute of Microbiology and
Virology, Ukrainian Academy of Sciences, Kiev

[Abstract] A study is made of the relationship of bacteria to the component parts of antifouling coatings. The capability of aerobic heterotrophic bacteria taken from the surface of metal specimens painted with KhV-5153 antifouling coating and exposed in sea water to grow on media containing colophony and cuprous oxide was studied. The capability of bacteria to

utilize an alcohol solution of colophony as a common nutrition source was also studied. It was found that 37.3% of cultures grew on media with all concentrations of colophony. The remaining cultures reacted differently to the presence of this component, increasing percentages growing with lower contents of colophony. Slime-forming bacteria were more sensitive to cover than other species tested. The studies confirmed that some marine bacteria can grow on media containing both colophony and copper. Figure 1; references 4: 3 Russian, 1 Western.
[806-6508]

UDC: 579,69:620.193.8

INFLUENCE OF AEROBIC BACTERIA ON CORROSION OF PASSIVATING AND NONPASSIVATING STEELS AND ALLOYS IN SEA WATER

Kiev MIKROBIOLOGICHESKIY ZHURNAL in Russian Vol 46, No 1, Jan-Feb 84
(manuscript received 6 Jul 82) pp 18-20

TSOKUR, N. I., Department of Marine Corrosion of Metals, Institute of Physics and Mechanics, Ukrainian SSR Academy of Sciences, Odessa

[Abstract] A study is made of the influence of the association of saprophytic bacteria typical for fouling of a number of ship building materials on the corrosion resistance of two groups of steels and alloys. The experiments utilized specimens of high strength martensitic chrome-nickel steel, AMg 62 alloy, a passivating metal, as well as nonpassivating steels - ST3, 10KhSND and G20. The surface of the specimens was ground and degreased. Specimens were weighed and flame sterilized. Corrosion testing was performed under laboratory conditions in 2 liter vessels 20-21°C, the mean water temperature in summer in Odessa bay. Natural sea water, sterile sea water and sterile sea water with 2 day saprophite associations were used. Differences were found in the corrosion rates of the two groups of metals. Corrosion was greatest in sea water for the passivating metals. Nonpassivating metals corrode more slowly in the medium with saprophytic bacteria than in natural or sterile sea water. Since the development of aerobic saprophytic bacteria is accompanied by absorption of oxygen from the surrounding medium, the influence of these microorganisms on corrosion rate is largely related to the reduction in concentration of oxygen diffusing to the metal. References 10 (Russian).
[807-6508]

DIGITONIN SOLUBILIZATION OF MUSCARINIC CHOLINORECEPTOR AND ITS COMPLEX WITH QUINUCLIDINE BENZYLATE

Moscow BIOLOGICHESKIYE MEMBRANY in Russian Vol 1, No 4, Apr 84.
(manuscript received 25 Oct 83, after revision 11 Jan 84) pp 341-348

RINKEN, A. A., LANGE, Yu. L. and YARV, Ya. L., Departments of Biochemistry and Organic Chemistry, Tartu State University, Tartu

[Abstract] The solubilization of muscarinic cholinoreceptors from rat cortex with commercial digitonin (detergent) was studied using tritiated quinuclidine benzylate. Receptors were assayed by radioligand binding, with free and bound ligand separated on Sephadex G-50. Addition of atropine sulfate demonstrated the absence of nonspecific binding. The saturated detergent solution used for solubilization contained 60% digitonin and 40% gitonin. The association constants for solubilized and bound receptor were $4.8 \times 10^{-4} \text{sec}^{-1}$ and $8.5 \times 10^{-3} \text{sec}^{-1}$, respectively. Receptor solubilization was 30-38% at both 0° and 25°, and was essentially complete after 10 minutes. Further loss of bound receptors after 10 minutes reflected spontaneous denaturation. When the radioligand was added before solubilization, receptor yield was 36-46%. About 25% of membrane protein was resistant to solubilization. The data confirm the heterogeneous localization of the receptor molecules in the membrane suggested earlier by experiments with proteases and protein-modifying agents. Gel filtration on Sephacryl S-300 and Sepharose 6B gave a Stokes radius of 37-39 Å and a molecular mass of 76-79 kDa for the solubilized receptor, similar to results obtained by sodium dodecyl sulfate, polyacrylamide gel electrophoresis. The solubilized receptor appears to be a single polypeptide molecule. However, a minor component with molecular weight greater than 100 kDa was noted. Figures 4; references 27: 2 Russian, 25 Western.
[1564-12126]

PHYSICAL-CHEMICAL AND BIOLOGICAL PROPERTIES OF DUAL-SPIRAL RNA-INTERFERON INDUCER

Moscow VOPROSY VIRUSOLOGII in Russian Vol 29, No 4, Jul-Aug 84
(manuscript received 18 Nov 83) pp 463-468

FELDMANE, G. Ya., UMBRASHKO, Yu. B., BUYKIS, A. Kh., DUK, A. E.,
POLUEKTOVA, L. E., GRAUDINYA, Zh. P., OSE, V. P. and LOZHA, V. P.,
Institute of Microbiology imeni of Avgust Kirkhenshteyn, Latvian Academy
of Sciences; Riga Medical Institute

[Abstract] Data are presented on the immunomodulating activity of dsRNA, including the influence of the preparation on the activity of natural killers. dsRNA was obtained from E. coli strain Q13 infected with ambermutant sus_{11} of f2 bacteriophage, which contains a nonpolar ambermutation leading to excess accumulation of replicative forms of the phage. Unpurified leukocytic human interferon was used. The acute toxicity of the dsRNA preparation determined with mice is 7.5-12.5 mg/kg. Alkaline hydrolysis eliminated toxic effects and increased the LD_{50} by a factor of 10 to 20. Thermal denaturation did not decrease toxicity as much. The preparation causes the formation of interferon in various animal species. This article presents information on the influence of dsRNA on natural killer activity for the first time. dsRNA reliably stimulates natural killers in all concentrations tested. The cytologic activity of natural killers in hepatitis B patients was no different from that of practically healthy persons. Interferon stimulated the activity of natural killers in all patients except those with chronic active liver disease. Figures 5; references 31: 15 Russian, 16 Western. [1601-6508]

UDC: 577.112

ISOLATION AND CHARACTERISTICS OF SODIUM CHANNEL COMPONENTS

Moscow BIOLOGICHESKIYE MEMBRANY in Russian Vol 1, No 8, Aug 84
(manuscript received 25 Apr 84) pp 858-867

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[Abstract] Fast sodium potential-controlled channels regulate selective sodium permeability of electrically-excited membranes in generation of the action potential. The molecular mechanism of their functioning is not yet known. This article suggests a method of separation of tetrodotoxin receptors of the rat brain membrane which can produce the protein components of the fast sodium channel in milligram quantities. The method allows separation

of the receptor into individual subunits and chemical description of the polypeptides produced. Three glycoproteins were found with molecular weights of 260, 39 and 37 kDa. The subunits with 260 and 37 kDa were joined by disulphide bonds. The three subunits are distinguished by a high degree of glycosylation. The content of sialic acids is particularly great. Due to the low hydrophobicity and high degree of glycosylation, it is assumed that a significant portion of the polypeptide chains are outside the membrane lipid bilayer. Figures 5; references 26: 4 Russian, 22 Western.
[1616-6508]

UDC: 613.64:576.35

MITOTIC ACTIVITY OF MYELOKARYOCYTES EXPOSED TO MICROWAVE RADIATION AT
2375 MHz

Kiev TSITOLOGIYA I GENETIKA in Russian Vol 18, No 4, Jul-Aug 84
(manuscript received 4 May 83) pp 264-267

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Hygiene

[Abstract] Results are presented on the study of the mitotic activity of bone marrow cells exposed to low intensity microwave radiation. Male rats were irradiated in groups of 15 in an anechoic chamber by a magnetron generator. Three series of experiments were performed to determine the mitotic activity of myelokaryocytes at various levels and durations of microwave radiation. The first studied the dynamics of reproduction of bone marrow cells for one month after one time irradiation for 7 hours at $500 \mu\text{W}/\text{cm}^2$. The second involved computation of the mitotic index of the myelokaryocytes at various radiation exposures. The third involved the study of the change in M_1 as a function of intensity of microwave radiation (varying between 10 and $500 \mu\text{W}/\text{cm}^2$) over a month of irradiation with a daily exposure of 7 hours. The mitotic activity of the bone marrow cells during the month of exposure to low intensity radiation varied primarily within the levels of diurnal variations. The rise and fall of M_1 resulting from the effects of microwaves on critical phases in the mitotic cycle was variously reflected in changes in the relationship of reproduction and differentiation processes of cells and the biorhythm of their mitotic activity as a function of radiation intensity. Figure 1; references 17: 5 Russian, 12 Western. [852-6508]

EFFECT OF UV RADIATION ON SURFACE OF IMMUNOCOMPETENT MAMMAL CELLS,
REPORT 3. ULTRASTRUCTURAL CHANGES IN GLYCOCALYX OF MOUSE LYMPHOCYTES

Leningrad TSITOLOGIYA in Russian Vol 26, No 7, Jul 84
(manuscript received 10 Oct 83) pp 856-859

KRYLENKOV, V. A., BRUDNAYA, M. S. and KOMISSARCHIK, Ya. Yu., Institute of
Cytology, USSR Academy of Sciences, Leningrad

[Abstract] An analysis is presented of the ultrastructural modifications of the surface of immunocompetent cells irradiated with UV radiation of various spectral compositions. Electron microscope studies were performed of the external perimembrane layers (EPML) of mouse spleen lymphoid cells irradiated with short (254 nm) and long (365 nm) wave UV radiation in isoeffective doses (LD₇-LD₁₈). In lymphocytes irradiated with SUV rays, the nature of the EPML changes: structureless electron-dense layers almost disappear, uniformity of distribution of granules around the perimeter of the cell is disrupted, discrete electron-dense sectors of the lymphocyte surface appear. In lymphocytes irradiated with LUV rays, the ultrastructure of the EPML retains basically the same nature as in nonirradiated cells. Only some disruption in uniformity of distribution of granules around the perimeter of the cells is observed. The effect of isoeffective (in terms of lethal effect) doses of SUV and LUV rays on lymphoid mouse spleen cells thus results in different ultrastructural changes in EPML of irradiated cells, revealed by staining with alcyan blue and ruthenium red stains. References 19: 9 Russian, 10 Western.
[856-6508]

UDC 615.384:547.221].099.015.44:616.155.3-092.4

USE OF RAJI LINE HUMAN LYMPHOID CELL CULTURES TO TEST TOXICITY OF
PERFLUOROCARBON EMULSIONS AND THEIR INDIVIDUAL COMPONENTS

Moscow FARMAKOLOGIYA I TOKSIKOLOGIYA in Russian Vol 47, No 5, Sep-Oct 84
pp 117-120

ARKHIPOV, V. V. and NARIMANOV, A. A., Institute of Biological Physics,
USSR Academy of Sciences, Pushchino

[Abstract] Human lymphoid cell cultures of the Raji line were used to evaluate the toxicity of perfluorocarbon compounds. A concentration of 10^{-3} M fluoride ion was found to inhibit cell growth, while 5×10^{-5} M did not. This indicates that the free fluoride content of an emulsion of perfluoroorganic compounds should not exceed 10^{-5} M. The toxicity of less-than-totally fluorinated compounds was variable, with a fluorinated decalin containing one hydrogen and a double bond between the rings more toxic than its saturated analog by a factor of 100. The cytotoxicity of the proxanol stabilizers depended on their purity and did not change during preparation of the emulsions. Modified starch, used to maintain the colloid osmotic pressure in perfluorocarbon emulsion plasma expanders, exhibited little to no toxicity. The data demonstrate that the toxicity of perfluorocarbon emulsions is dependent on the toxicity of the proxanol stabilizers, as well as on physical properties. Due to the insolubility of perfluorocarbon compounds, cell cultures are useful for evaluating toxicity. Figure 1; references 6: 5 Russian, 1 Western.
[1520-12126]

UDC 615.917:547.391.1'239.2].015.44:616,36-099].015.25:615.272.4.014.425

USE OF ANTIOXIDANTS FOR PREVENTING HEPATOTOXIC EFFECT OF ACRYLONITRILE

Moscow FARMOKOLOGIYA I TOKSIKOLOGIYA in Russian Vol 47, No 5, Sep-Oct 84
(manuscript received 15 Feb 84) pp 96-100

IVANOV, V. V. and KLIMATSKAYA, L. G., Departments of Pathophysiology and Hygiene, Krasnoyarsk Medical Institute

[Abstract] The effect of reduced glutathione, reduced L-cysteine, unithiol, ionol and alpha-tocopherol on acrylonitrile toxicity was tested in rats. Glutathione and cysteine were administered 30 minutes before acrylonitrile, unithiol with the toxin and at 3, 5, 24 and 48 hours after, ionol 6 hours before acrylonitrile and alpha-tocopherol 48, 24 and 2 hours before. All compounds prevented the appearance of fructose phosphate aldolase in the serum after acrylonitrile injection and partially reversed the depression of butylcholinesterase levels otherwise observed. Alpha-tocopherol also prevented the appearance of aldolase in the serum after chronic acrylonitrile inhalation. The data indicate that the membrane toxic effects of acrylonitrile may be a result of its prooxidant properties. In the liver postmitochondrial supernatant, to which carbon monoxide had been added to inhibit cytochrome P-450, acrylonitrile reduced the thiol level only 13%, as compared to 53% in the absence of carbon monoxide. This decrease in SH groups is due to thiol alkylation by the product of acrylonitrile metabolism 2-cyanoethylene oxide. The low molecular weight thiols may prevent lipid oxidation by the peroxide free radicals produced from this metabolite. Figures 2; references 10: 8 Russian, 2 Western.
[1520-12126]

UDC 615.246.9:547.496.2]+615,917:547.242].015.4:616.69

EFFECT OF ALCOHOL AND TETURAM ON GONADS OF MALE RATS AND THEIR PROGENY

Moscow FARMAKOLOGIYA I TOKSIKOLOGIYA in Russian Vol 47, No 5, Sep-Oct 84
(manuscript received 14 Jan 84) pp 82-85

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Academy of Medical Sciences, Moscow

[Abstract] A study was conducted concerning the effects of alcohol on the gonads and the progeny of male rats in which chronic alcoholism had been produced. The gonadotropic action of 200 mg/kg teturam, used to treat alcoholism, was also examined in alcoholic and intact rats and their progeny. In both the alcoholic rats and their male offspring, depressed spermatozoal concentration and mobility with increased numbers of pathological forms were observed. Two weeks after eradication of the alcoholism sperm count and mobility were partially restored; however

pathological forms in progeny were further increased. Teturam caused oligospermia in progeny, decreased sperm mobility in both parent and offspring and increased sperm pathology. However, in offspring of alcoholic rats, sperm pathology was less in the teturam treated group. Alcoholism caused distinct disturbances in the process of spermatogenesis which did not improve two weeks after eradication of the syndrome. Teturam alone produced insignificant changes, while decreasing the toxic effects of alcohol on the process. Lesser disturbances were seen in the progeny of the alcoholic rats. The data demonstrate passage of the negative gonadal effects of alcohol to the progeny of male rats. Teturam exhibited insignificant gonadotropic action and did not enhance the negative effects of alcohol. Figure 1; references 15: 10 Russian, 5 Western.
[1520-12126]

UDC 615.22:547.582.2].07

SEARCH FOR AND STUDY OF ANTIARRHYTHMIC DRUGS IN SERIES OF CROWN-ESTERS

Moscow FARMAKOLOGIYA I TOKSIKOLOGIYA in Russian Vol 47, No 5, Sep-Oct 84
(manuscript received 16 Aug 83) pp 29-31

LUK'YANENKO, N. G., BOGATSKIY, A. V., YAROSHCHENKO, I. M., BONGAY, V. G., NAZAROV, Ye. I. and SHAPKIN, V. A., Department of Bioorganic and Theoretical Chemistry, Physical Chemistry Institute, UkSSR Academy of Sciences, Odessa

[Abstract] The antiarrhythmic properties of macrocyclic polyesters containing four ester groups, four ether oxygens and twenty carbons were compared to a similar macrocyclic polyester containing two ether oxygens and to two macro-cyclic polyethers. The experimental compounds exhibited marked antiarrhythmic activity in aconitine, calcium chloride and strophanthine induced arrhythmia. Toxicity was low; the margin of safety exceeded 100. The compounds did not affect arterial pressure or myocardial inotropic or chronotropic function. No myorelaxant properties or influence on hexobarbital sleep was observed. The auricular refractory period was not affected. In isolated rat heart, the compounds prevented arrhythmia but did not change the chronotropic reaction to exogenous acetylcholine or adrenalin. They also lengthened the second period before onset of arrhythmia in isolated heart perfused with 20 mM KCl. The compounds increased the threshold of ventricular fibrillation by a factor of 1.5 in intact rats; in isolated heart this effect was calcium-ion dependent. The data indicate that macrocyclic polyesters are a promising new class of antiarrhythmic and antifibrillatory agents. Figure 1; references 15: 7 Russian, 8 Western.
[1520-12126]

UDC 616.24-002,5-06:[616.33+616.36]-085.821.873.21-036.8-07:616.154.94+[616.24+616.36]-008.949,4:615.281.873.21

ISONIAZID LEVELS IN BLOOD, RESECTED LUNG TISSUE, AND GALLBLADDER BED IN PATIENTS WITH TUBERCULOSIS AND GASTRIC OR HEPATIC DISEASES IN RELATION TO ROUTE OF ADMINISTRATION

Moscow ANTIBIOTIKI in Russian Vol 29, No 9, Sep 84
(manuscript received 6 Mar 84) pp 671-673

ANDROSOV, E. Ye., VINOKUROV, V. A., GARVALINSKIY, F. G., KARITA, V. R.
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Khabarovsk Medical Institute

[Abstract] Blood and tissue levels of isoniazid were followed in 80 patients with active pulmonary tuberculosis, and in 41 recovered subjects, to determine the effects of concomitant gastric or hepatic pathology on tuberculosis chemotherapy. Treatment of gastric or hepatic disease patients with 0.6 g of isoniazid per os resulted in blood levels of the drug, 1 and 24 h after treatment, of 4.48 and 0.46 $\mu\text{g/ml}$, respectively. In patients without hepatic or gastric pathology the respective values were 5.12 and 0.64 $\mu\text{g/ml}$. Administration of isoniazid in the form of an ultrasonic aerosol (6 ml of 10% solution) to tuberculosis patients with hepatic or gastric disorders yielded blood values of 6.08 and 0.48 $\mu\text{g/ml}$ at the corresponding periods of time. Studies on 41 patients with a former history of tuberculosis, and operated for acute or chronic cholecystitis, showed much greater tissue concentration of isoniazid in the gallbladder bed after per os administration of the drug, than after administration via the respiratory route. However, aerosol treatment yielded drug concentrations of 34.13 $\mu\text{g/g}$ in the walls of resected lesions in active cases 1 h after administration, while enteral therapy provided a maximum of 0.66 $\mu\text{g/g}$ after 3 h. These observations point to the superiority of aerosol management of pulmonary tuberculosis, and the fact that accompanying gastric or hepatic pathology may affect drug distribution in the body. References 6 (Russian).
[1530-12172]

ANTIVIRAL AND THERAPEUTIC EFFECT OF PROTEASE INHIBITORS IN VIRAL INFECTIONS:
EXPERIMENTAL AND CLINICAL OBSERVATIONS

Moscow VOPROSY VIRUSOLOGII in Russian Vol 29, No 4, Jul-Aug 84
(manuscript received 12 Jan 84) pp 491-497

ZHIRNOV, O. P., OVCHARENKO, A. V., BUKRINSKAYA, A. G., URSAKI, L. P.,
IVANOVA, L. A., KETILADZE, Ye. S. and STEBAYEVA, L. F., Institute of Virology
Imeni D. I. Ivanovskiy, USSR Academy of Medical Sciences, Moscow

[Abstract] Experiments were performed on white mice which were infected intranasally with A/Auru/2/68 influenza virus at the LD₅₀. The mice then received either saline solution or protease inhibitors each four to six hours. In clinical studies, 70 juvenile influenza patients two months to fourteen years of age were treated by inhalation irrigation of the respiratory mucosa with 6% epsilon-AKK (epsilon-aminocaproic acid) protease inhibitor for 20 to 30 minutes in an atmosphere of oxygen two to three times per day, plus oral epsilon-AKK at 0.1-0.2 g/day per kg body weight. The data obtained in mice demonstrated a significant reduction in pathologic changes and indicated activation of the defense reaction of the mouse organism. In the clinical tests, antiviral activity of epsilon-AKK was recorded as depression in replication of the virus in sputum samples as well as decrease in time of continuation of clinical symptoms, Figures 2; references 36: 15 Russian, 21 Western. [1601-6508]

UDC: 612.821.2+615.7

PHARMACOLOGY OF MEMORY (SOME RESULTS AND PROSPECTS)

Leningrad FIZIOLOGICHESKIY ZHURNAL IMENI I. M. SECHENOVA in Russian Vol 70,
No 7, Jul 84 (manuscript received 6 Feb 84) pp 983-989

BORODKIN, Yu. S. and ZAYTSEV, Yu. V., Department of Pharmacology of Memory
(headed by Yu. S. Borodkin), Scientific Research Institute of Experimental
Medicine, USSR Academy of Medical Sciences, Leningrad

[Abstract] This review of the Soviet and Western literature discusses the capabilities and limits of the pharmacologic approach to the study of memory. Results obtained using the nonspecific connector ethimizole as a pharmacologic probe of changes accompanying the formation and fixation of memory are summarized. The role of cerebral systems in effects on short-term memory of a large class of substances influencing neuromediator systems has been revealed. It has been found that substances activating synaptic transmission and increasing excitability of neuronal constellations in certain cerebral structures facilitate learning and help to increase the length of memory. The multiplexity of neurochemical mechanisms of memory provides almost unlimited possibilities for searching out new pharmacologic substances to optimize

memory and learning. Ethimizole meets all the requirements which must be placed on substances with nootropic effects. It has clear influence on the memory of animals and man, an anti-amnesic effect, it increases the resistance of the brain to damaging influences, strengthens memory processes in the visual centers, smooths interhemispheric asymmetry and asymmetry in the oculomotor centers, and improves memory in old animals. Ethimizole has the optimal effect on retention of memory when it is applied once after learning or one hour before testing. References 41: 36 Russian, 5 Western. [796-6508]

UDC: 615.015

MECHANISM OF TOLERANCE TO XENOBIOTICS

Moscow USPEKHI SOVREMENNOY BIOLOGII in Russian Vol 98, No 1 (4),
Jul-Aug 84 pp 90-102

KRYLOV, S. S., Institute of Toxicology, USSR Ministry of Health, Leningrad

[Abstract] The development of tolerance to xenobiotics, cross tolerance and its importance for pharmacology were reviewed. The history of the concept of tolerance and signs of development of tolerance are discussed. It is noted that tolerance does not develop to some substances, for example cocaine. Tolerance mechanisms are analyzed as a property of the organ to adapt itself to continuous long-term or frequency repeated exposure to biologically-active foreign substances. Long-term chronic exposure to xenobiotics results in the development of three independent processes: tolerance, meaning reduced or zero sensitivity to the initial dose of a substance; accelerated elimination of the substance from the organism; and appearance of dependence on the substance. The mechanisms of the three processes are distinct but they may overlap in time or occur in parallel in various combinations. Though this literature review formulates the basic characteristics of tolerance, it is noted that studies to date serve to illustrate the great complexity of the problem and the large variety of hypotheses which have been used to explain it. Only the hypothesis of the humoral factor in tolerance can combine and explain all known data on tolerance. References 110: 26 Russian, 84 Western. [850-6508]

METHOD AND DEVICE FOR ESTIMATING EMOTIONALLY POSITIVE EFFECT OF
PHARMACOLOGIC SUBSTANCES

Moscow ZHURNAL VYSSHEY NERVNOY DEYATEL'NOSTI IMENI I. P. PAVLOVA in Russian
Vol 34, No 4, Jul-Aug 84 (manuscript received 26 Jul 83) pp 802-803

ZVARTAU, E. E., PETRYAEVSKAYA, N. V., GUTKIN, V. I. and KIM, V. Yu.,
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[Abstract] A modification of an earlier method for evaluating the preference reaction and a device constructed to allow automation of collection of the necessary information are described. The method is based on the use of the natural reflex of avoidance of lighted spaces in rodents. After 4 to 6 days in a chamber with light and dark portions, an animal is administered the drug being tested and is placed in the light portion; the "time asymmetry" of time spent by the animal in the light and dark portions is recorded. If the drug has an emotionally positive effect, the animal will spend more time in the lighter portion. Movement is recorded each time the animal passes between the two portions of the chamber, or moves from one quadrant to another of each of the two portions, thus cutting electric eye beams. Figure 1; references 4: 1 Russian, 3 Western.
[848-6508]

UDC: 612.015.1-06:613.2]-08

ENZYMATIC MECHANISMS OF PROTECTION OF BODY FROM FOREIGN FOOD SUBSTANCES

Moscow VESTNIK AKADEMII MEDITSINSKIKH NAUK SSSR in Russian No 8, Aug 84
(manuscript received 9 Dec 83) pp 84-89

TUTEL'YAN, V. A., Institute of Nutrition, USSR Academy of Medical Sciences,
Moscow

[Abstract] A study was made of the specifics of induction of the mono-oxygenase system of the endoplasmic reticulum in the liver under physiological conditions and under the influence of various xenobiotics. The process of formation of this line of enzyme defense in ontogenesis is noted. The influence of mixtures of polychlorinated biphenyls (PCB) on the monooxygenase system was studied as a model of the combined effect of xenobiotics having the properties of various types of inductors. The possibility of very high and persistent retention of elevated cytochrome P-450 in the liver after one time administration of a xenobiotic should be considered in toxicologic and hygienic studies of foreign substances. Another important line of enzyme defense of the organism from xenobiotics is the formation of their conjugate with SH-glutathione with the participation of cytoplasmic glutathione transferase or glucuronic acid catalyzed by microsomal UDP-glucuronosyl

transferase. The fine line of defense involves a combination of lysosomal hydrolases which degrade biopolymers. Several examples of the participation of various enzyme systems in the protection of the organism from foreign substances are analyzed. Figures 3; references 14: 6 Russian, 8 Western. [1624-6508]

UDC: 612.822.1

EFFECT OF PICROTOXIN AND GABA ON LIBERATION OF ^3H NORADRENALINE AND ^{14}C -GABA FROM RAT BRAIN CORTICAL SYNAPTOSOMES

Yerevan NEYROKHIMIYA in Russian Vol 3, No 2, Apr-Jun 84
(manuscript received 14 Jun 83) pp 163-167

TOZALAKYAN, P. V., ARAKELYAN, L. N. and GEVORKYAN, G. A., Institute of Biochemistry, Armenian SSR Academy of Sciences, Yerevan

[Abstract] A comparative study is presented of the liberation of the mediators noradrenaline (NA) and GABA from rat-brain cortex synaptosomes under the influence of 40 mM K^+ and GABA. Picrotoxin was used to block the chlorine channels to determine the influence of Cl^- in GABA regulation. In the first series of experiments studied the liberation of ^3H labeled NA and ^{14}C labeled GABA. Significantly more captured mediator was released in the case of GABA than in the case of NA. The maximum liberation of GABA occurred later than that of NA, agreeing with the assumption of different mechanisms of their liberation. Statistically reliable inhibition of spontaneous NA liberation was observed upon perfusion of the synaptosomes with a buffer containing picrotoxin. GABA and picrotoxin did not change the liberation of NA from the synaptosomes evoked by 40 mM K^+ . Joint addition of GABA and picrotoxin decreased the output of the label, then showed a permanent increase in the liberation of NA and decrease in liberation with GABA, indicating specific effects of picrotoxin and GABA on NA-ergic synaptosomes. Figures 2; references 17: 2 Russian, 15 Western. [813-6508]

UDC: 577.17-612.822.1-616.895.8-615.787

NEUROCHEMICAL AND PSYCHOPHARMACOLOGICAL ASPECTS OF PROLACTIN

Yerevan NEYROKHIMIYA in Russian Vol 3, No 2, Apr-Jun 84
(manuscript received 18 Apr 83) pp 193-204

GAMALEYA, N. B. and KUDINOVA, Ye. V., All-Union Scientific Research Institute of General and Forensic Psychiatry imeni V. P. Serbskiy, Moscow

[Abstract] This is a review. Results are presented from studies of the relationship of secretion of prolactin and the functioning of various neurochemical systems in the brain. The neurochemical aspects of prolactin

secretion are discussed. Low doses of noradrenaline have been found to stimulate prolactin secretion, while higher doses inhibit it. Psychopharmacologic aspects of prolactin secretion are also discussed. The neuroendocrine effect can be used to differentiate CNS stimulants from the methylphenidate group from stimulants in the amphetamine group. The secretion of prolactin in psychopathologic states is virtually the same as in health. The secretion of prolactin is closely related to the functioning of neuromediator systems in the brain. The use of the neuroendocrine approach to study mechanisms of development of various mental disorders can yield information on neurochemical processes in the brain in life by studying peripheral fluids in the organisms such as blood and spinal fluid. References 72: 2 Russian, 70 Western.
[813-6508]

UDC: 573:007

LEUKOTRIENES, NEW CLASS OF HIGHLY-EFFECTIVE BIOLOGICAL SUBSTANCES

Moscow USPEKHI SOVREMENNOY BIOLOGII in Russian Vol 97, No 3, May-Jun 84
pp 413-425

FROLOV, Ye. P., RUDAKOV, I. A. and SVYATKINA, O. B., Institute of Control Problems (Automation and Telemechanics), Moscow; Moscow Scientific Research Institute of Pediatrics and Pediatric Surgery, RSFSR Ministry of Health

[Abstract] Leukotrienes were discovered in 1979, though their effects had been known since the 1940's. They are hydroxylated derivatives of arachidonic acid formed in the cytoplasmic membranes of various cells and converted to leukotrienes by lipoxygenase. Leukotrienes C_4 , D_4 and E_4 have the same biological activity as the slow regulating substance found in the fluid flowing from lungs perfused with a solution containing cobra venom. The leukotrienes can excite nerve cells and cause strong contraction of smooth muscles. The other group includes LTB_4 and HETE, which have chemotactic and chemokinetic properties, acting as factors increasing cellular infiltration of the tissues in inflammation. The leukotrienes and slow reacting substance participate in formation of pathological reactions in bronchial asthma. They play an important role in the regulation of various organs and systems. They may participate in regulating the tone of smooth muscle, the permeability of vascular walls, processes of secretion, mobility and direction of motion of blood cells. They may also act as nervous system excitation mediators. They are involved in the mechanisms of pathologic processes not only of bronchial asthma, but also of eczema, allergic contact dermatitis, psoriasis and rheumatoid polyarthritis. References 101 (Western).
[849-6508]

NEW FUNCTION OF 3'-TERMINAL POLYADENYL SEQUENCE IN EUKARIOTIC mRNA

Moscow USPEKHI SOVREMENNOY BIOLOGII in Russian Vol 97, No 3, May-Jun 84
pp 354-365

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[Abstract] It is thought that the poly(A) sequence participates in the selection of 3'-terminal sectors of mRNA chains during their biogenesis in the nucleus and assures mRNA stability in the cytoplasm. The mechanism is unknown, but it is thought that the presence of poly(A) at the 3'-end protects the mRNA from nuclease attack. Poly(A) may participate in splicing of heterogeneous nuclear RNA and the mechanism of transport of mature mRNA from the nucleus to the cytoplasm. It is suggested that the structural integrity of ribosomal subparticles is monitored at the 3'-end of the poly(A) sequence, and that bonds between proteins and between rRNA and protein subparticles are strengthened at the 3'-end of the poly(A) sequence. The interaction of poly(A) with other mRNA sequences and the organizational structure of the ribosomal particles which move along the poly(A) mRNA sequence are described. Old ribosomal particles in subparticles may be replaced with new ones synthesized as they move along the poly(A) portion of the mRNA which codes the ribosomal proteins. References 54: 5 Russian, 49 Western.

[849-6508]

UDC: 547.363:543.865:582.282.23.577

GENETIC CONTROL OF AMBIGUITY OF TRANSLATION IN EUKARIOTES

Moscow USPEKHI SOVREMENNOY BIOLOGII in Russian Vol 97, No 3, May-Jun 84
pp 341-353

TER-AVANESYAN, M. D., INGE-VECHTOMOV, S. G., SURGUCHEV, A. P. and
SMIRNOV, V. N., Faculty of Biology and Soils, Leningrad State University
imeni A. A. Zhdanov; All-Union Cardiologic Scientific Center, USSR Academy
of Medical Sciences, Moscow

[Abstract] This is a review. The mechanism of nonhereditary variability (modification variability) has been much less studied than mechanisms of hereditary variability. It apparently cannot be reduced simply to processes of gene action regulation. The phenomenon of spontaneous modification of variability is also significant. This article demonstrates that ribosomal suppressors in yeast can increase ambiguity of translation, indicating a possible participation of ribosomal proteins and RNA in controlling translation accuracy. A study of mutations influencing the accuracy of cytoplasmic ribosome functioning reveals ribosomal proteins which participate in translation

accuracy control, There is apparently a center in the cytoplasmic and mitochondrial ribosomes of eukariotes as well as in the ribosomes of prokariotes which is responsible for maintenance of a certain, possibly optimal, level of unambiguity in decoding of genetic information. The interference of external factors in their normal operation may be responsible for modification variability of protein molecules to the extent to which external factors are responsible in normal processes of reproduction and repair of genes for induced mutations. References 118: 16 Russian, 102 Western, [849-6508]

UDC: 575.24:576.851.48

TRANSPOSABLE GENETIC ELEMENTS

Moscow USPEKHI SOVREMENNOY BIOLOGII in Russian Vol 97, No 3, May-Jun 84 pp 323-340

PEKHOV, A. P., University of People's Friendship imeni P. Lumumba, Moscow

[Abstract] This is a review. Mobile, migrating or transposable genetic elements are DNA segments capable of independent movement from one site to another within a genome. They have a number of important properties. It is thought that these elements are of bacterial origin and influence the heredity of prokariotes and eukariotes alike. Known transposable elements are listed and described. The effects of their transposition are noted. The transposable elements themselves are important for the evolution of various replicans. Their significance in the stability of yeast genomes and changes in protozoan antigens has been reported. References 219: 9 Russian, 210 Western. [849-6508]

UDC: 578.087.1:615.9

STATISTICAL APPROACH TO ESTIMATION OF POISON ACTION THRESHOLDS

Moscow BIOLOGICHESKIYE NAUKI in Russian No 4, Apr 84 (manuscript received 10 Oct 83) pp 97-103

MAKSIMOV, V. N. and NOSOV, V. N.

[Abstract] Series of animal experiments are commonly used to determine the LD₅₀ of a substance. The authors suggest more complete testing in order to determine the highest concentration of the substances for which none of the test population of animals dies, as well as the lowest concentration for which all of the test population dies. Equations are derived to utilize data from such test series in evaluating the effects of the compounds tested on the experimental animals. (Recommended by the Chair of General Ecology and Hydrobiology, Moscow State University.) Figure 1; references 8: 5 Russian, 3 Western. [876-6508]

FREQUENCY OF CHROMOSOMAL ABERRATIONS IN BONE MARROW OF MONKEYS AND THEIR PROGENY AFTER EXPOSURE TO AFLATOXIN B₁

Kiev TSITOLOGIYA I GENETIKA in Russian Vol 18, No 3, May-Jun 84
(manuscript received 4 Aug 82) pp 173-176

ADZHIGITOV, F. I., KOSICHENKO, L. P., POPANDOPULO, P. G., GUBELADZE, D. A.
and DZHEMILEV, Z. A., Institute of Experimental Pathology and Therapy,
USSR Academy of Medical Sciences, Sukhumi

[Abstract] Aflatoxin B₁ is one of the strongest natural hepatocarcinogens known. This article reports study of the mutagenic effect of aflatoxin B₁ in doses approximating the actual quantities received by man with food in tests on two species of monkeys. Bone marrow cells were withdrawn before and after administration of a solvent for aflatoxin B₁. The frequency of chromosomal aberrations in experimental animals was reliably greater than the spontaneous level ($P < 0.01$). The toxin induced structural mutations of chromosomes in two phylogenetically similar species of monkeys with similar karyotypes. The results indicate that aflatoxin B₁ induces structural mutations in the first and subsequent mitotic cycles and at later times. Genome mutations also appear. Chromosomal damage caused by aflatoxin B₁ appears in primates for at least 2 years. References 14: 4 Russian, 10 Western.
[853-6508]

UDC: 613.632:[661.487+661.257+661.249.1]-07:616-008.939.15

CHANGE IN CERTAIN LIPID METABOLISM PARAMETERS UPON ISOLATED AND COMBINED EFFECTS OF HYDROGEN FLUORIDE, SULFUR DIOXIDE AND HYDROGEN SULFIDE IN VARIOUS CONCENTRATIONS

Moscow GIGIYENA TRUDA I PROFESSIONAL'NYYE ZABOLEVANIYA in Russian No 6,
Jun 84 (manuscript received 22 Feb 83) pp 16-19

AYTBAYEV, T. Kh., Institute of Regional Pathology, Alma-Ata

[Abstract] Animal experiments were used to determine the content of total lipids and cholesterol in blood serum and the total content of lipids in the lungs in experiments conducted on 337 mature male rats. The animals were exposed to isolated and combined effects of the gases mentioned in the title for 4 months, 4 hours per day, 5 days per week. It was found that the content of total lipids was reliably increased upon isolated and combined exposure to hydrogen fluoride, sulfur dioxide and hydrogen sulfide. The lipid content in the lungs was decreased under the influence of all these gases at the minimum concentration, differed little from the control at higher concentrations, except for hydrogen sulfide, which caused a decrease in the level of lipids even at higher concentrations. Figures 2; references 7 (Russian).
[1625-6508]

CHANGES IN SECONDARY AND TERTIARY SERUM ALBUMIN STRUCTURE UPON INTERACTION
WITH VARIOUS LIGANDS

Moscow VOPROSY MEDITSINSKOY KHIMII in Russian Vol 30, No 4, Jul-Aug 84
(manuscript received 19 May 83) pp 48-50

TRINUS, F. P., BRAVER-CHERNOBUL'SKARA, B. S., LUYK, A. I., BOLDESKUL, A. Ye.
and VELICHKO, A. N., Kiev Scientific Research Institute of Pharmacology and
Toxicology, Ukrainian SSR Ministry of Health, Kiev

[Abstract] Studies were performed with 5 compounds having high physiological activity but differing significantly in the spectrum of biological effect and chemical structure. Etafos and heterofos are organophosphates, acrex is a dinitrophenol, polychloropinene is an organic chlorine substance, while embikhin is an aliphatic chloroethylamine. Human serum albumin monomer fraction was obtained by gel chromatography. The results of fluorescent studies indicate that the interaction of all the compounds studied with albumin is accompanied by conformational restructuring of the biopolymer. Complex formation is accompanied by short-wave displacement of spectral maxima from 341 to 330-322 nm and a decrease in intensity. The data indicate that adaptation of albumin to xenobiotics of various chemical structures occurs differently. Compounds which interact with the protein with high affinity and specificity cause changes primarily in the tertiary protein structure. Interaction with substances with low affinity and specificity is accompanied by deeper restructuring involving both tertiary and secondary protein structure. References 19: 16 Russian, 3 Western.
[1602-6508]

BRIEFS

DRUGS FROM THE OCEAN--New species of marine organisms, the tissues of which contain valuable biologically active substances with strong antimicrobial properties, have been discovered by the scientists of the Far East Research Center, USSR Academy of Sciences, during a voyage aboard the Professor Bogorov research ship in the Indian Ocean. Use of the newest physicochemical methods of investigation revealed the potential benefit of using sponges, echinoderms and Coelenterata for recovery of valuable drugs. [By M. Viktorov] [Text] [Moscow MEDITSINSKAYA GAZETA in Russian 12 Sep 84 p 4] 10,657

10,657

CSO: 1840/1517

PHYSIOLOGY

ION CHANNELS IN NEUROPHYSIOLOGICAL RESEARCH

Kiev RABOCHAYA GAZETA in Russian 5 Sep 84 p 1

[Article by a Ukrainian News Agency correspondent under the rubric "Scientist Grants Interview on the Mysteries of Life" is based on an interview with P. G. Kostyuk, academician of the USSR Academy of Sciences. Passages in uppercase appear in boldface in original source]

[Text] At the Fifth Congress of the European Neurochemical Society held in Budapest, great interest was aroused by the lecture "Ion Channels--New Problems" presented by the honorary lecturer of the congress, P. G. Kostyuk, academician of the USSR Academy of Sciences and director of the Physiology Institute imeni A. A. Bogomolets, UkSSR Academy of Sciences. This internationally known scientist, who is the author of more than 250 scientific works, has made a substantial contribution to the general physiology of the nervous system, neurophysiology, and biophysics of the nerve cell. The original scientific direction, developed by P. G. Kostyuk and his students, helps to uncover the mysteries of life's mechanisms and serves as a theoretical foundation for understanding the nature of the basic nervous processes, on which brain activity is based. The Soviet School of Neurophysiologists, founded by P. G. Kostyuk, has received wide recognition in scientific circles of the world. On his sixtieth birthday P. G. Kostyuk has been awarded the title, "Hero of Socialist Labor", for his great services in the development of biological science and for training scientific personnel.

A Ukrainian News Agency correspondent asked P. G. Kostyuk to discuss the practical importance of the neurophysiological research results.

"First of all," said the scientist, "I want to point out the great responsibility that people of scientific thought in our country face. Proably, in no place in the world do scientists have such extensive opportunities for creative research.

"It may be said, without exaggeration, that all the technical achievements, which have enriched mankind in the last quarter century, are used to the fullest extent in our everyday work. Modern equipment enables us to study the processes which take place directly in the heart, vessels and human brain. Using this base completely, we have been able to determine the movement patterns, through the nerve cells, of the electrically charged particles--ions--to find the key of knowledge to the information transmission processes, to discover the nature of excitation and inhibition, to find the factors affecting the 'work capacity' of nerve cells, as well as to produce unique instruments which enable us to look inside the tiny natural laboratories.

"Mastery of the regulatory mechanisms of the body's complex processes is very promising for gene engineering and practical medicine. If we succeed in finding the substances affecting the ion channel activity of cells, we shall be able to stimulate the nervous system as well as calm it. This will enable us to fight effectively the symptoms with which many diseases start. And, to find the substances that act selectively on individual areas--this means to lay the foundation for neuropharmacology and to produce reliable drugs. Even now, in response to our 'requests' the chemists are synthesizing and testing new preparations; and, we check their effect and determine the direction of further searches.

"The results of our research, introduced into medical practice, will help in the diagnosis and treatment of cardiovascular and endocrinological systems as well as in oncological and other dangerous diseases. These results will serve to perfect the "man-machine-environment" system and will answer many questions related to ergonomics and engineering psychology.

"The isolation of molecular structures and their transfer to artificial membranes will enable use to use their unique capabilities to solve a great number of technical problems. For example, in the future scientists will probably succeed in developing artificial muscles; it is namely the ion channels that induce the contraction and weakening of muscular cells. A structural study of ion pumps and membrane communications may lead to the production of their synthetic analogs, which will be selectively permeable for essential substances. To imitate this process technically--this means solving the problem of fresh water on the planet.

"These and many other problems constitute the contents of the all-union comprehensive scientific research programs, the 'Brain', 'Nerve Impulse' and 'Ion Channel'.

12525

CSO: 1840/003

UDC 612.822.5

DIFFERENT LEVELS OF DRINKING MOTIVATION AND MORPHOLOGICAL CHANGES IN
HYPOTHALAMUS

Baku IZVESTIYA AKADEMII NAUK AZERBAYDZHANSKOY SSR: SERIYA BIOLOGICHESKIKH
NAUK in Russian No 1, 1984 pp 102-106

ASKEROV, F. B. and ALEKPEROVA, S. A., Institute of Physiology

[Abstract] Wistar rats were employed in cytochemical studies on the effects of water deprivation and subsequent water-loading on the morphological status of the hypothalamus. Evaluation of the data demonstrated that after one day of deprivation the lateral preoptic, supraoptic and the lateral hypothalamic nuclei sustain marked changes consisting of cell swelling, central chromatolysis, and peripheral translocation of the Nissl bodies. These changes were not modified by access to water for one day, but, after three days of access, individual neurons on the lateral preoptic and supraoptic nuclei regained normal morphology and histochemical characteristics. After three days of deprivation all hypothalamic nuclei showed marked structural aberrations, and after one day of access to water only isolated nuclei in the supraoptic nuclei evidenced recovery. After three days of water intake structural normalization was evident in the lateral preoptic, supraoptic and paraventricular nuclei. These observations demonstrate that the hypothalamic structures most sensitive to the state of water balance are the supraoptic, paraventricular and lateral preoptic nuclei. Figures 6; references 9: 8 Russian, 1 Western.
[1509-12172]

UDC 612.822.3+612.827

EFFECTS OF ETHANOL ON DISCHARGE ACTIVITY OF CEREBELLAR PURKINJE CELLS IN CAT

Bakuk IZVESTIYA AKADEMII NAUK AZERBAYDZHANSKOY SSR: SERIYA BIOLOGICHESKIKH
NAUK in Russian No 1, 1984 pp 112-117

ISMAYLOV, T. M.

[Abstract] Electrophysiological studies were conducted on the cerebellar Purkinje cells to assess the effects of moderate ethanol doses, since, in

acute alcoholic episodes, movement disorders resemble those of cerebellar ataxia. The results obtained on nembutal+chloralose anesthetized adult cats showed that intravenous infusion of moderate ethanol doses (30% 2 ml) led to a sharp increase in the rate of Purkinje cell discharge (ca. 62 Hz), and a concomitant decrease in the interdischarge interval (ca. 16 msec) (vs. respective control values of 26 Hz and ca. 39 msec). The increase in the discharge rate was evident within 4-5 min of ethanol infusion and persisted for 30-60 min, with histographic analysis showing an increase in simple spikes and a decrease in complex spike. These changes were attributed to activation of climbing fibers impinging on the Purkinje cells, presumably by acetaldehyde, and diminished as the levels of acetaldehyde decreased. Figures 3; references 13: 2 Russian, 11 Western.
[1509-12172]

EFFECTS OF TEMPERATURE ON HEPATIC TYROSINE AMINOTRANSFERASE IN ALBINO RATS

Ashkhabad ZDRAVOOKHRANENIYE TURKMENISTANA in Russian No 2, Feb 84 pp 19-20

KURBANOV, Kh. and CHARYYEVA, G. Kh., Chair of Biochemistry, Turkmen Order of People's Friendship State Medical Institute

[Abstract] Outbred male albino rats were employed in a study designed to study the effects of body temperature on hepatic tyrosine aminotransferase activity (ATA). The animals were subjected to temperatures of 30-50°C for 30 min, resulting in rectal temperature increases of 0.8-4.9°C. An external temperature of 45°C (rectal increase 4.4°C) was compatible with survival and gave a maximum increase in ATA to 212.5 ± 0.1 U (vs. 53.8 ± 0.1 U control value) after 2 h, a change which persisted for 24 h (140.2 ± 0.5 U). Higher temperatures depressed ATA and were incompatible with animal survival for more than 2 h. Changes in ATA activity were regarded as reflective of activation of adrenal mechanisms by the elevated body temperature at the more moderate ranges, and depletion or exhaustion of the adrenal system by the temperature extremes which depressed ATA. References 12: 10 Russian, 2 Western.
[1503-12172]

INFLUENCE OF RIBOXIN ON MYOCARDIAL METABOLISM UNDER ALTITUDE HYPOXIA

Moscow BYULLETEN' EKSPERIMENTAL'NOY BIOLOGII I MEDITSINY in Russian No 4,
Apr 84 (manuscript received 13 Jul 83) pp 484-486

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[Abstract] A study was made of the influence of riboxin on certain structural and metabolic processes in the myocardium under long term exposure to high altitude hypoxia. Experiments were performed on 72 rats. Twelve animals of group 1 received riboxin through a gastric probe at 0.03 mg per g of body mass each day; 18 rats, in group 2, were exposed for 6 hours each day to an altitude of 6000 m; 24 rats in group 3 received riboxin in the same dose as the animals of group 1 before "elevation" in the barochamber. The animals were sacrificed on days 7, 15 and 30. Morphometric, histochemical and electron microscope methods of examination were used. In group 1, changes occurred in the quantitative enzyme activity indicators and content of glycogen. In group 2, there were significant changes in cardiac muscle metabolism, particularly processes of oxidative phosphorylation. In group 3, the changes in enzyme activity in the cardiac muscle were less significant than in group 2. By the 30th day of the experiment the changes had returned to the level of the control group. The morphometric studies showed that under conditions of high altitude hypoxia, riboxin results in the development of less expressed cardiac hypertrophy, indicating the positive influence of this preparation on the energy and plastic basis of processes of hyperfunction and hypertrophy of the cardiac muscle. Figure 1; references 7: 6 Russian, 1 Western.
[880-6508]

UDC: 612.172.1-06:612.223.1

CORONARY BLOOD FLOW IN CATS BREATHING ALTERED GAS MEDIUM

Moscow BYULLETEN' EKSPERIMENTAL'NOY BIOLOGII I MEDITSINY in Russian No 3,
Mar 84 (manuscript received 11 May 83) pp 280-282

SANOTSKAYA, N. V. and MATSIYEVSKIY, D. D., Laboratory of Respiratory Pathophysiology (headed by Doctor of Biological Sciences A. M. Kulik) and Bioengineering Laboratory (headed by Candidate of Biological Sciences V. S. Sinyakov), Institute of General Pathology and Pathologic Physiology, USSR Academy of Medical Sciences, Moscow

[Abstract] A study is presented of coronary circulation in hypoxia, hyperoxia and hypercapnia. Experiments were performed on 18 cats with open thorax and artificial pulmonary ventilation under pentobarbital narcosis. Coronary blood flow was measured in the left coronary artery and in some experiments in the corresponding coronary vein. The volumetric rate of blood

flow in the circumflex branch of the left coronary artery averaged 9.1 ml/min. The blood volume per minute of the heart averaged 380 ml/min., the volume per beat averaged 2.4 ml. Upon inhalation of gas mixtures with reduced oxygen content there was an increase in coronary circulation depending on the severity of hypoxia. Hypoxia and hypercapnia both caused a significant increase in coronary circulation resulting apparently from expansion of the coronary vessels. Changes in the phase form of the coronary blood flow indicate an increase in resistance of the coronary vessels with respect to extravascular compression during heart contractions and consequently an increase not only in diastolic but also in systolic fractions in the total increase in coronary circulation under these conditions. Figures 3; references 13; 9 Russian, 4 Western.
[879-6508]

UDC: 612.813

ANTIDROMIC ELECTRICAL ACTIVITY OF MOTOR TERMINATIONS OF NERVE-MUSCLE SYNAPSES OF RATS WITH ACETYLCHOLINESTERASE INHIBITION

Leningrad FIZIOLOGICHESKIY ZHURNAL IMENI I. M. SECHENOVA in Russian
Vol 70, No 2, Feb 84 (manuscript received 22 Dec 82) pp 166-172

SERDYUCHENKO, I. Ya., Department of Normal Physiology (headed by P. I. Sibro), State Medical Institute, Dnepropetrovsk

[Abstract] Acute experiments on spinal rats before and after administration of 0.3-0.5 mg/kg proserine were used to determine the amplitude of antidromal potential of peripheral segments of the anterior roots of the lumbar segment of the spinal cord with individual and repeated stimulus of the tibial nerve. The experiments established that stimulus of the nerve with a series of pulses is accompanied by depression in the amplitude of antidromal action potentials, the depth and duration of which can be quantitatively analyzed. Before proserine was administered, stimulus of the tibial nerve by individual pulse caused an antidromal action potential of 12 ± 3 mV. After administration of proserine the individual stimulus caused the action potential followed by high frequency asynchronous electrical activity. After administration of proserine, depression of antidromal action potentials is observed only at the beginning of a series of pulses. The results indicate that after inhibition of ACE in nerve-muscle synapses of rats in vivo, stimulus of the nerve leads to initial excess output of the mediator, sufficient to depolarize and develop antidromal propagating excitation along the nerve structures of the synapse. The excitation causes depression of antidromal potentials evoked by stimulus of the nerve by a series of pulses. Excess output of the mediator, upon rhythmic stimulus of the nerve, lasts for 150-200 ms, followed by stabilization of the level of its secretion. The excess initial output of acetylcholine and depression of antidromal potentials depends largely on the functional status of the nerve-muscle synapses. Figures 3; references 21; 15 Russian, 6 Western.
[801-6508]

EFFECTS OF HYPERTHEMIA ON NEURONAL UPTAKE OF ^3H -NOREPINEPHRINE IN ISOLATED RAT ORGANS

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 277, No 6, Aug 84
(manuscript received 12 Dec 83) pp 1502-1504

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Sciences, Moscow

[Abstract] Wistar rats were employed to test the effects of thermal stress (30 or 60 min at 45°C) on ^3H -norepinephrine (HNEP) uptake in the hypothalamus, adrenals and heart atria over a 10 day period. Exposure of the animals for 30 min resulted in rectal temperature elevation of 2.3°C , while 60 min gave a 3.3°C raise. One hour after exposure the body temperature fell to a sub-normal 36.7°C , with at least 10 days required for the re-establishment of normal body temperature (37°C). Time course analysis of HNEP uptake showed 30 min exposure resulted in diminished uptake in all the tissue except the hypothalamus, where the uptake increased to ca. 150% of the control value. Exposure to 45°C for 60 min resulted in a reduction in hypothalamic uptake, and a moderate increase in uptake in the other tissues. After 48 h HNEP uptake increased ca. 150-170% in all the tissues, with subsequent fluctuations above and below baseline uptake in a pattern unique to each tissue, approaching the baseline value by day ten. These observations suggest that even a mild form of thermal stress can induce profound neuroendocrine imbalance that may persist for ten days or more. Figures 2; references 11: 3 Russian, 8 Western,
[1526-12172]

UDC 616.127-008.929.96-02:612.766.2]-092.9

MYOCARDIAL PROTEIN METABOLISM DURING VARIOUS PERIODS OF EXPERIMENTAL HYPOKINESIA IN RAT

Moscow PATOLOGICHESKAYA FIZIOLOGIYA I EKSPERIMENTAL'NAYA TERAPIYA
in Russian No 4, Jul-Aug 84 (manuscript received 10 Sep 82) pp 36-40

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[Abstract] In order to study the dynamics of protein metabolism in hypokinesia, ^{14}C -leucine was administered to motion-restricted and control rats one or seven days before decapitation and ^3H -leucine one hour before decapitation. Heart weight and protein weight in the sarcoplasm and actomyosin

fractions did not increase in the experimental animals, while they did increase in the controls. The weight of the sarcoplasm decreased in the eighth and last week of the experiment. In all experimental animals, except those sacrificed at week three, specific activity in the sarcoplasm exhibited the same dynamics as in controls. Since protein biosynthesis was suppressed, this indicates enhanced breakdown of rapidly renewed (and thus highly labeled) protein. Degradation was most pronounced at weeks one and eight. Similar results were obtained for the actomyosin complex. Degradation was less marked at weeks two through four. The data indicate that hypokinesia leads to a marked reorganization of myocardial protein metabolism, with a partial adaptive reaction observed at weeks two through seven. References 13: 12 Russian, 1 Western.
[1522-12126]

UDC: 612.821.8+612.822.3

PHYSIOLOGICAL PRINCIPLES OF HUMAN HIGHER NERVOUS ACTIVITY. LATERALIZATION OF PERCEPTION OF SHORT TIME INTERVALS AND CORTICAL EVOKED ACTIVITY IN MAN

Moscow ZHURNAL VYSSHEY NERVNOY DEYATEL'NOSTI IMENI I. P. PAVLOVA in Russian Vol 34, No 4, Jul-Aug 84 (manuscript received 20 Jun 83) pp 627-634

KOSTANDOV, E. A., VAZHNOVA, T. N., GENKINA, O. A., ZAKHAROVA, N. N., IVASHCHENKO, O. I. and POGREBINSKIY, S. A., All-Union Scientific Research Institute of General and Forensic Psychiatry imeni V. P. Serbskiy, Moscow

[Abstract] The task of this work was to answer the following questions:

1) Is the specialization of the left hemisphere for perception of short time intervals related to processing of speech sound signals or it is a general property of this hemisphere? 2) At what time intervals does asymmetry of hemispheres appear? 3) What changes in the P₃₀₀ wave in various areas of the cortex are observed during mental estimation of very short time intervals? Studies were performed on 15 practically healthy persons in their late 20's and early 30's, 7 males and 8 females, right handed, with normal vision. The subjects were physicians or laboratory workers at the Institute. The number of correct reactions in a test of timing flashes of light was found to depend on the time interval between components of the test stimulus. A pause of 180 ms was best recognized. The number of correct recognitions of the 180 ms time interval increases upon repeated testing over a period of 6 days. The better recognition of the 180 ms interval is apparently explained by the fact that the conscious experience of the test subject is more equated with pauses of this length between visual stimuli than with the shorter 10 and 60 ms pauses used. Hemisphere asymmetry was observed at 10 ms, but not at 60 or 180 ms. This confirms the hypothesis that the left hemisphere has the special mechanism for estimation of short time intervals, shorter than at 60 ms. Local activation of the cortical zone addressed by the standard stimulus plays a significant role in forming the nerve model of a time interval. Figures 5; references 8: 5 Russian, 3 Western.

[848-6508]

APPEARANCE OF GENOTYPIC DEPENDENCE OF EVOKED POTENTIALS IN MAN DURING PERCEPTION OF VARIOUS VISUAL SIGNALS

Moscow ZHURNAL VYSSHEY NERVNOY DEYATEL'NOSTI IMENI I. P. PAVLOVA in Russian
Vol 34, No 4, Jul-Aug 84 (manuscript received 1 Nov 83) pp 642-648

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[Abstract] The appearance of genotypic dependence of evoked potentials recorded in response to spatially-structured and semantic stimulus was analyzed. Studies were performed by using twins. Similarity in twins of wave form and amplitude-time parameters of evoked potentials upon various stimuli was compared in groups of healthy monozygotic and same-sex dizygotic twins 18 to 25 years in age. It was found that monozygotes usually have greater correlation than dizygotes in terms of similarity of evoked potential wave form. Statistical reliability of the level of similarity is achieved in the occipital area only for evoked potentials in response to a flash, in the vertex in practically all cases except evoked potentials in response to the word "dom" [Russian for "home" or "building"] and a picture of a building. Stimulus-zonal specifics were thus found in genotypic dependence of these reactions. The genotypic dependence differs for amplitude and latent periods of individual evoked potential components. The latent periods are more subject to genetic control. Figure 1; references 21: 9 Russian, 11 Western. [848-6508]

REFLECTION OF SEMANTIC CHARACTERISTICS OF MENTAL ACTIVITY IN IMPULSE ACTIVITY OF NEURONS

Leningrad FIZIOLOGICHESKIY ZHURNAL IMENI I. M. SECHENOVA in Russian
Vol 70, No 7, Jul 84 (manuscript received 2 Mar 84) pp 881-891

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[Abstract] A brief history is presented of studies in the area of determination of neuronal impulse activity as a function of the type of mental activity undertaken by a test subject with cerebrally-implanted electrodes. It has been statistically reliably demonstrated that during mental activity there actually is restructuring of the pulse train reflecting neuronal activity, in response to changes in words being pronounced or heard. The present stage of work in this area involves study of various restructuring of pulse activity under conditions as close as possible to those under which mental activity is actually performed. The studies indicate that some 10,000 areas in the brain participate in the support of mental activity. References 31: 16 Russian, 15 Western. [796-6508]

STUDY OF INTERRELATIONSHIPS AMONG DISTANT NEURONAL POPULATIONS OF THE BRAIN DURING MENTAL ACTIVITY

Leningrad FIZIOLOGICHESKIY ZHURNAL IMENI I. M. SECHENOVA in Russian Vol 70, No 7, Jul 84 (manuscript received 2 Feb 84) pp 892-903

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[Abstract] Results are presented from studies of interrelationship in the operation of distant neuronal populations in deep structures of the human brain. Recordings of multicell activity were performed in Parkinsonism patients in whom intracerebral electrodes had been implanted. The activity was recorded on an 8-channel magnetic recorder. The data were input to a computer which searched for connections between remotely located neuron populations. The results revealed quantitative characteristics of connections among the set of neuronal populations studied. A pair was found which was stably interrelated both when subjects performed a monotonous activity and during memorization. Two other anatomically close neuronal populations showed no such stable interrelationship. The results showed that both rigid and flexible elements are presented in the dynamic activity support system.

References 9 (Russian).

[796-6508]

ANALYSIS OF COMPONENTS IN REACTION OF NEURONAL POPULATIONS IN THE HUMAN BRAIN IN THE PROCESS OF MEMORIZATION OF VISUAL STIMULI

Leningrad FIZIOLOGICHESKIY ZHURNAL IMENI I. M. SECHENOVA in Russian Vol 70, No 7, Jul 84 (manuscript received 13 Feb 84) pp 904-911

KROPOTOV, Yu. D., Department of Human Neurophysiology (headed by N. P. Bekhtereva), Scientific Research Institute of Experimental Medicine, USSR Academy of Medical Sciences, Leningrad

[Abstract] Five Parkinsonism patients with implanted gold electrodes in their brains were asked to memorize visual signals consisting of complex polygons, some of which could be associated with familiar forms while others could not. The pulse activity of neuronal populations were recorded as the patients memorized sequences of the pattern. No significant differences were found between mean frequencies of background fragment discharges and early components, but in 13 of 49 populations the amplitude of late components was

significantly greater during recognition of the semantically significant polygons as opposed to the unfamiliar shapes. The data show that late components of neuronal reactions depend on the subjective evaluation of the visual pattern by the subject and are modified during learning. Figures 3; references 21: 15 Russian, 6 Western.
[796-6508]

UDC: 612.822.3+616.89

STRUCTURAL-FUNCTIONAL ORGANIZATION OF PAROXYSMAL AND STABLE PATHOLOGIC STATES

Leningrad FIZIOLOGICHESKIY ZHURNAL IMENI I. M. SECHENOVA in Russian Vol 70, No 7, Jul 84 (manuscript received 22 Feb 84) pp 912-920

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[Abstract] Results are presented from a study of the cerebral structural-functional organization of paroxysmal and stable psychopathologic states in patients with various forms of focal epilepsy, diagnosis and treatment of which was performed by means of long-term intracerebral electrodes in the limbic thalamic nuclei, basal ganglion, limbic cortex and various zones of the temporal and frontal cortex. Studies were performed on 13 patients by recording superslow physiological processes, meaning rhythmic and aperiodic superslow oscillations and the stable millivolt range potential difference and the electrochemical potential. Measurements were performed between the intracerebral electrodes and a reference electrode made of gold introduced in the frontal or temporal area. Basic differences were found in the organization of superslow physiological processes in patients with generalized, partial paroxysmal and emotional-mnestic disorders. Statistical analysis of the superslow processes indicates that the functional organization of individual autonomous formations depends to some extent on the nature of the pathologic process. The range of cerebral formations was found which was responsible for beginning and organizing the pathologic event. Areas of the brain could be distinguished, including those in the epileptogenic and epileptic foci, by means of which in each interval of development of the disease mechanisms are formed which limit the propagation of pathologic excitation through the brain. Figures 6; references 7 (Russian).
[796-6508]

INFLUENCE OF ELECTRIC STIMULATION IN KINDLING REGIMEN ON RAT BRAIN MEDIATOR SYSTEMS

Leningrad FIZIOLOGICHESKIY ZHURNAL IMENI I. M. SECHENOVA in Russian Vol 70, No 7, Jul 84 (manuscript received 22 Feb 84) pp 944-951

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[Abstract] The purpose of this work was to produce the kindling phenomenon by electric stimulation through corneal electrodes. This allows study of processes occurring in the brain upon gradual reduction of the convulsive threshold while avoiding the difficulties involved in stereotactic implantation of electrodes. Studies were performed on 76 male Wistar rats. Corneal electrodes were made of silver in the shape of the lens of the eye. A drop of 2% trimecane was placed in each eye before the caps were installed to improve electrical contact and act as an analgesic. Electrical stimulus was performed over a period of 3 weeks, the response proceeding through a regular sequence of stereotyped reactions to development of an epileptic-like syndrome similar to amygdaloid kindling. Stimulation resulted in a decrease in the content of dopamine, norepinephrine, taurine, and glutamine in the hippocampus, a decrease in homovenilic acid, norepinephrine and an increase in glutamic acid, glutamine, GABA and chlorine in the striatum, a decrease in glutamine and a decrease in GABA and glycine in the cerebellum. Electrical stimulus thus results in imbalance between excitation and inhibition mediator systems and predominance of excitatory systems, thus forming the epileptoform syndrome. Figures 2; references 19: 1 Russian, 18 Western.
[796-6508]

FUNCTION OF GLUTAMATE RECEPTORS IN MEMBRANE VESICLES, PROTEOLIPOSOMES AND HYBRID N18Tg2a NEUROBLASTOMAL CELLS

Leningrad FIZIOLOGICHESKIY ZHURNAL IMENI I. M. SECHENOVA in Russian Vol 70, No 7, Jul 84 (manuscript received 13 Feb 84) pp 952-960

DAMBINOVA, S. A., BESEDIN, V. I., GORODINSKIY, A. I., MARGULIS, M. N. and PAVLOVA, O. I., Department of Human Neurophysiology (headed by Academician N. P. Becktereva), Scientific Research Institute of Experimental Medicine, USSR Academy of Medical Sciences, Leningrad

[Abstract] Data are presented from a study of transport and selective glutamate-binding membrane protein (GMP) functions in model systems: membrane vesicles, proteoliposomes and intact nerve cells using monoclonal antibodies produced to GMP. The experiments were performed on male rats. Synaptic membranes and mitochondria from the cerebral cortex were revealed by differential centrifugation. The dynamics of the accumulation of radioactive mono- and bivalent cations were studied during the course of isolation of synaptic fractions. Electron photomicrographs of fractions of membrane vesicles and mitochondria are presented. Selective activation of transport of sodium ions was found in the model system with physiological concentrations of L-glutamate. Monoclonal antibodies against recognition areas of receptors block functioning of GMP in all model systems. The population of neuroblastoma hybrid cells was found to have nerve cells with functionally mature receptor structures capable of bonding glutamate and giving a physiological response to the effect of the neuromediator. The physiological sensitivity of the membrane to glutamate appears at a comparatively high level of morphological and biochemical differentiation and depends on factors responsible for the structural organization of the chemoreceptor complex. Figures 5; references 20:

14 Russian, 6 Western.

[796-6508]

SYSTEMS APPROACH TO RESISTANCE AND PLASTICITY OF NEUROPHYSIOLOGICAL PROCESSES IN ADAPTIVE CEREBRAL ACTIVITY

Leningrad FIZIOLOGICHESKIY ZHURNAL IMENI I. M. SECHENOVA in Russian Vol 70, No 7, Jul 84 (manuscript received 6 Feb 84) pp 961-967

VASILEVSKIY, N. N., Department of Ecologic Physiology (headed by N. N. Vasilevskiy), Scientific Research Institute of Experimental Medicine, USSR Academy of Medical Sciences, Leningrad

[Abstract] A study is made of the problem of resistance and adaptive regulatory processes based on the theory of stable pathologic states, rigid and flexible links in control systems. Previously, the authors had set forth

the supposition of fixation and reproduction of information in memory in discrete microscopic portions reflecting the status of the brain, its different and efferent sensory systems in each successive microscopic time interval.

Materials produced in recent studies have shown that the level of adaptation is determined by the biorhythmologic structure of the EEG in microscopic time intervals. The abundance of highly probable, even dominant, rhythms, relationships among EEG components in adapted persons indicates superior autoregulation of neurodynamic processes in the system of homeostasis and memory. Three groups of persons are distinguished with cortical dominance, cortical-limbic and limbic-brain stem dominance. Neuroticism increases in this same sequence. The first two groups are more stress resistance and better adapted, group three manifests a high inertia. Systems analysis of stability and plasticity in the biorhythmologic structure of neurophysiologic processes shows a complex combination of rigid and flexible elements in the regulation of functions during the course of adaptation and stabilization of various states.

Figures 2; references 35 (Russian).

[796-6508]

UDC: 612.82+612.822.3+154.2

LATERALIZATION OF EMOTIONAL FUNCTIONS

Leningrad FIZIOLOGICHESKIY ZHURNAL IMENI I. M. SECHENOVA in Russian Vol 70, No 7, Jul 84 (manuscript received 6 Feb 84) pp 976-981

KOSTANDOV, E. A., All-Union Scientific Research Institute of General and Forensic Psychiatry imeni V. P. Serbskiy, Moscow

[Abstract] A study is made of the results of recording the P₃₀₀ wave in the left and right hemispheres in response to neutral and emotionally-significant words. The P₃₀₀ wave in response to emotional words develops in the occipital area with a significantly shorter latent period than in response to neutral words. This effect is clearly lateralized, significantly stronger in the left hemisphere than in the right. The results of the study emphasize the incorrectness of the opinion that negative emotions are organized in the right hemisphere, positive in the left. In response to an emotionally significant verbal stimulus, the P₃₀₀ wave develops with shorter latent period in the left than in the right hemisphere. The dynamic changes in relationships in the time or organization of the late positive cortical response in the left and right hemispheres to negative emotional stimulus are the reverse of what is observed upon perception of neutral words, as a result of the shift in the focus of the local nonspecific activation in the direction of the left hemisphere. They are related to analysis of the emotional verbal signal and indicate that the left hemisphere plays a large part in perception of negative emotional information and, consequently, in cortical organization of negative emotion. Figures 3; references 17: 6 Russian, 11 Western.

[796-6508]

INFLUENCE OF VASOPRESSIN ON LONG-TERM MEMORY (PSYCHOPHYSIOLOGICAL AND CLINICAL ASPECTS)

Leningrad FIZIOLOGICHESKIY ZHURNAL IMENI I. M. SECHENOVA in Russian Vol 70, No 7, Jul 84 (manuscript received 6 Feb 84) pp 990-996

MOROZOV, G. V., IVANITSKIY, A. M., STRELETS, V. B., ARTSEULOVA, O. K., PIROGOVA, Ye. K. and NOVIKOV, Ye. M., All-Union Scientific Research Institute of General and Forensic Psychiatry imeni V. P. Serbskiy, Moscow

[Abstract] A study was made of the influence of one of the neuropeptides of the vasopressin group, lysine-vasopressin, on memory, EEG and development of a negative conditioned reflex to alcohol. The substance was administered intranasally 2 to 3 drops into each nostril to 107 chronic, stage II, alcoholics 22 to 50 years of age under treatment at the authors' institute. Jacob's tests indicated that lysine-vasopressin slightly increased the volume of direct and mechanical memory. A significant increase in strength of both conditioned and unconditioned reflexes was achieved with lysine-vasopressin. The probability of developing a negative conditioned reflex to ethanol was significantly increased. One year after the study, questionnaires indicated that 52% of the patients receiving lysine-vasopressin used no alcohol, felt good and were working. Only 14% of the patients in a control group did as well. It was thus demonstrated that the use of lysine-vasopressin in combination with apomorphine hydrochloride significantly improves the results of development of alcohol avoidance reactions. Figures 3; references 28: 9 Russian, 19 Western.
[796-6508]

RIGID AND FLEXIBLE LINKS IN NEUROPHYSIOLOGIC CORRELATES OF IMMUNOLOGIC PROCESSES

Leningrad FIZIOLOGICHESKIY ZHURNAL IMENI I. M. SECHENOVA in Russian Vol 70, No 7, Jul 84 (manuscript received 13 Feb 84) pp 997-1005

KORNEVA, Ye. A., Department of Pathophysiology and General Pathology (headed by Ye. A. Korneva), Scientific Research Institute of Experimental Medicine, USSR Academy of Medical Sciences, Leningrad

[Abstract] An electrophysiological study was conducted on the functional activity of the posterior hypothalamic field, dorso-medial and ventro-medial nuclei, the anterior preoptic area, lateral hypothalamic, anterior hyperthalamus field and medial preoptic fields, the supramammillary area, paraventricular and arcuate nuclei, tonsils and hippocampus. The study of various electrophysiological indices revealed restructuring of activity of

a number of hypothalamic structures during various stages of formation of the immune response to serum and corpuscular antigens. The results indicate a systematized and combined nature of the reaction - the functional status of each of the hypothalamic structures changes not in isolation but rather there is a regularity and sequence to changes in various structures which are manifested in immunization by various solutions and corpuscular antigens. Development of the immune reaction is supported by a cerebral system consisting of definite links. A few number of rigid links is involved in the first few days--the posterior hypothalamic field, medial preoptical area, tonsil, and the activity of certain other hypothalamic structures changes: anterior and lateral fields, posterior-medial, paraventricular, arcuate, ventro-medial nuclei, which apparently can be considered flexible links in the system. Figures 4; references 22: 19 Russian, 3 Western.
[796-6508]

UDC: 612.82+612.822.3

DOMINANT AND RECIPROCAL RELATIONSHIPS IN ORGANIZATION OF SPATIAL STRUCTURE
OF CORRELATION CONNECTIONS AMONG CEREBRAL BIOPOTENTIAL

Leningrad FIZIOLOGICHESKIY ZHURNAL IMENI I. M. SECHENOVA in Russian Vol 70,
No 7, Jul 84 (manuscript received 13 Feb 84) pp 1007-1022

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Physiology and Biochemistry imeni I. M. Sechenova, USSR Academy of Sciences,
Leningrad

[Abstract] Information is presented on analysis of the dynamics of cross-correlation relationships of EEG with presentation of data in three dimensional sector space, which allows determination of leading constellations in the system of coordination of activity of the hemispheres of the human brain at the state of rest and under functional loading. Studies were performed on 20 adults of both sexes 19 to 30 years of age and 6 young school children. EEG were recorded on a 13 channel EG-138 electroencephalograph. A computer was used to calculate a correlation matrix between instantaneous values of all the ordinary coefficients and summary correlation coefficients of the EEG for each given state, analyzing 20 to 50 sequential states. The data refine information on the primarily counterphase relationship of oscillations in biopotentials in the occipital and frontal segments of the brain. These relationships are dynamic and may easily be restructured even within the limits of a single state. The reciprocity and maintenance of great phase shift between individual EE waves in the frontal-occipital segments confirm the high coherence of oscillations of biopotentials in these areas. The results indicate nonequivalence of the relationships between hemispheres at any given moment. At the state of rest and in specific activation characteristics of functioning of neurophysiological mechanisms are revealed supporting individual coordinated activity of the entire brain. The cross correlation coefficients of EEG are grouped in factor space into separate constellations.

Within each constellation there are leading zones, the correlation relationships of activity of which with the EEG of the remaining segments changes over the course of the state with a high degree of synchronism. Such dominant areas most frequently include the frontal and occipital zones. The reciprocal interrelationship of correlation connections of the EEG of these zones are particularly characteristic for the hemisphere which subordinates its activity to the main mass of interhemispheric EEG correlations. At rest, this role was always played by the hemisphere contralateral to the leading hand. Figures 6; references 24: 21 Russian, 3 Western. [796-6508]

UDC: 612.821+616.89

NEUROFUNCTIONAL PROGRAMS OF CEREBRAL ACTIVITY AND SPECIFICS OF ITS STRUCTURES IN VARIOUS PSYCHOPATHOLOGIC STATES AND DURING TREATMENT

Leningrad FIZIOLOGICHESKIY ZHURNAL IMENI I. M. SECHENOVA in Russian Vol 70, No 7, Jul 84 (manuscript received 13 Feb 84) pp 1023-1030

MONAKHOV, K. K., PANYUSHKINA, S. V., BOCHKAREV, V. K. and NIKIFOROV, A. I., Scientific Research Institute of Clinical Psychiatry, USSR Academy of Medical Sciences; Laboratory of Neurophysiology, Moscow

[Abstract] Information is presented on the applied significance of neurofunctional systems. Some results of neurophysiological interpretation of neurophysical systems are noted. A number of physiological regularities have been observed in comparative study of the neurofunctional systems of healthy and diseased brains, related to the existence of various EEG systems. Analysis of the differential-structural description of EEG of depressive patients has revealed two processes in the formation of depression. In mild depression there is disruption of the structure of the neurofunctional system characteristic of healthy persons. As depression becomes more severe, a new neurofunctional system is formed in which the greatest information on severity of the depressive syndrome is carried by the system of EEG connections in the right hemisphere. Also, a syndrome-independent hemisphere specialization in operation of the brain in the formation of clinical symptoms resulting from dominating disruption of either effective or the ideator sphere is observed. Analysis of the results of system-structural analysis of EEG indicated that the generalized specifics or reaction of the EEG can be rather easily compared with the major processes of higher nervous activity. Neurofunctional systems are studied as reflections of the brain's activity program. The EEG profile characteristic for the effect of neuroleptics reflects the generalized reaction of deactivation, related to the influence of neuroleptics on the reticular formation. The correlates of neuroleptic action at the brainwide level of organization with electrical processes thus indicated is identical to the EEG pattern of the reaction of deactivation. These programs can be used to describe various mental and psychopathologic states, and in the final analysis, to create a rather complete neurophysiological classification of such states, sufficient for paraclinical diagnosis. Figures 2; references 14: 10 Russian, 4 Western. [796-6508]

TAURINE AND THE FUNCTION OF EXCITABLE TISSUES

Leningrad FIZIOLOGICHESKIY ZHURNAL IMENI I. M. SECHENOVA in Russian Vol 70, No 7, Jul 84 (manuscript received 28 Feb 84) pp 1046-1055

GUREVICH, V. S., Scientific Research Institute of Cardiology, Leningrad

[Abstract] A brief review is presented of the major literature data as well as the author's own experimental data on the participation of taurine in certain physiological reactions. The major hypotheses concerning the molecular mechanisms of action of taurine on excitable structures are presented. The influence of taurine on central nervous system, the cardiovascular system, behavioral reactions and other physiological effects are described. The rich spectrum of physiological effects of taurine has resulted in attempts at its direct clinical utilization. It has been used most successful in the treatment of epilepsy. The content of chlorine in the organs and tissues is studied. The presently available data on the biochemistry, physiology and pharmacology of taurine indicate that the substance plays an important physiological functions of the body. The mediator nature of taurine cannot be considered finally established, although it is most probable. One important characteristic of taurine is its participation in processes involving calcium ions. It is possible that the capability to cooperate in immobilization of calcium in areas of the cell membrane system, where it is required, is a universal property of taurine for all organs and tissues. Figures 2; references 89: 6 Russian, 83 Western. [796-6508]

UDC: 612.82.08

STEREOTAXIC METHOD IN HUMAN NEUROPHYSIOLOGY

Leningrad FIZIOLOGICHESKIY ZHURNAL IMENI I. M. SECHENOVA in Russian Vol 70, No 7, Jul 84 (manuscript received 20 Feb 84) pp 1057-1061

ANICHKOV, A. D., Department of Human Neurophysiology (headed by N. P. Bekhtereva), Scientific Research Institute of Experimental Medicine, USSR Academy of Sciences, Leningrad

[Abstract] A discussion is presented of the specifics of the stereotaxic method in human physiology which represents the basic distinctive features of this trend. One is the use of computer equipment. Others include elimination of spatial limitations and marking of the patient's head. Several models of stereotaxic apparatus have been developed which are attached to the markers, initially stainless steel rods inserted through the soft tissue to the skull. The traumatism of the procedure has been reduced by reducing the number of markers, after which the method of atraumatic marking became the basis for the development of the next series

of stereotaxic apparatus. Bite plates are currently used to fix the apparatus in position with respect to the skull. References 12 (Russian). [796-6508]

UDC: 612.822.3.08

POLYELECTRONEUROGRAPH--MODULAR AMPLIFIER SYSTEM FOR COMBINED STUDIES OF CEREBRAL BIOELECTRIC ACTIVITY

Leningrad FIZIOLOGICHESKIY ZHURNAL IMENI I. M. SECHENOVA in Russian Vol 70, No 7, Jul 84 (manuscript received 6 Feb 84) pp 1061-1065

DAN'KO, S. G. and KAMINSKIY, Yu. L., Department of Human Neurophysiology (headed by N. P. Bekhtereva), Scientific Research Institute of Experimental Medicine, USSR Academy of Medical Sciences, Leningrad

[Abstract] A description is presented of the polyelectroneurograph, a modular system for multichannel combined and separate amplification of various components of cerebral bioelectric activity from intracerebral and/or scalp electrodes. The most important functional capacity of the device is that of separate recording of slow and superslow electric processes, electro-subcortical signals and single electrode. The device also allows combination of leads and selection of monopolar, bipolar or chain leads for all of the different components of bioelectric activity recorded, the combinations being identical or different for various components and each electrode being connected with only one input of the amplifier. Figure 1; references 4 (Russian). [796-6508]

UDC: 577.157

EFFECT OF PROTEASE AND PHOSPHOLIPASE A₂ ON MEMBRANE-BONDED MUSCARINE CHOLINORECEPTOR OF RAT BRAIN

Yerevan NEYROKHIMIYA in Russian Vol 3, No 2, Apr-Jun 84 (manuscript received 26 Jan 83) pp 107-115

KEEMBRE, T. A., LANGE, Yu. L., RINKEN, A. A., TYAKHEPYLD, L. Ya. and YARV, Ya. L., Department of Biochemistry and Organic Chemistry, Tartu State University

[Abstract] A study is made of the kinetics of action of two proteases-- α -chymotrypsin and trypsin--on receptor protein. It was assumed that the rate of decomposition of protein bonded to the membrane is determined by its exposure in the environment, where it is accessible to water-soluble proteases. Incubation of the preparation of membrane-bonded muscarinic cholinoreceptor with α -chymotrypsin and trypsin leads to a decrease in specific

bonding of ^3H -quinuclidinyl benzylate with cerebral membranes. The inactivation of the receptor was not complete, however. Treatment of brain membranes with proteolytic enzymes did not influence the effectiveness of complex formation of quinuclidinyl benzylate with the receptor. The decrease in specific bonding observed reflects a change in the concentration of receptor sectors. A kinetic plan for the process of inactivation of muscarinic cholinoreceptors by the proteases is presented. Receptors with less affinity for acetylcholine do not have physiological activity. Figures 7; references 15: 1 Russian, 14 Western.
[813-6508]

UDC: 612.85

INFLUENCE OF INTERAURAL DIFFERENCES IN SOUND STIMULATION ON ACTIVITY OF NEURONS IN CAT LID NUCLEUS

Leningrad FIZIOLOGICHESKIY ZHURNAL IMENI I. M. SECHENOVA in Russian Vol 70, No 3, Mar 84 (manuscript received 4 Oct 83) pp 291-298

SHINKARENKO, S. A., Department of Normal Physiology (headed by N. V. Bratus'), Medical Institute imeni N. I. Pirogov, Vinnitsa

[Abstract] A study is presented of the reaction of the neurons in the red nucleus under the influence of sound signals modeling various spatial positions of a nonmoving and moving sound source under conditions of dichotic stimulation. Experiments were performed on mature cats under chloral narcosis. The animals were put on artificial respiration to allow recording of motor reactions. The pulse activity of the neurons was recorded intracellularly with isolated tungsten microelectrodes. The sound stimulus was clicks 0.2 to 0.4 ms in length each two seconds. The data obtained showed that the neurons of the red nucleus are sensitive to interaural distinctions in stimulation in time and intensity, as well as signals modeling directed movement of the sound source. The sensitivity of the red neurons is approximately the same as that of neurons in auditory system centers beginning at the mesencephalic level as well as neurons of other integrative motor centers of the brain. The specific share of red nucleus neurons reacting to movement of the sound source was significantly higher than in the specific auditory system nuclei or cerebellum. The high selectivity of red nucleus neurons for signals with interaural differences of stimulation in time and intensity, as well as those modeling movement of the sound source, indicates that the red nucleus may be the structure where a number of final stages of recognition of the spatial position of the sound source is performed and motor activity related to localization behavior is corrected. Figures 4; references 15: 7 Russian, 8 Western.
[797-6508]

SPATIAL CHARACTERISTICS OF RESPONSE OF THE CAT INFERIOR COLLICULUS TO MOTION OF SOUND SOURCE

Leningrad FIZIOLOGICHESKIY ZHURNAL IMENI I. M. SECHENOVA in Russian Vol 70, No 3, Mar 84 (manuscript received 18 Mar 83) pp 299-305

AL'TMAN, Ya. A., KUDRYAVTSEVA, I. N. and RADIONOVA, Ye. A., Laboratory of Auditory Physiology (headed by Ya. A. Al'tman), Institute of Physiology imeni I. P. Pavlov, USSR Academy of Sciences, Leningrad

[Abstract] In experiments on nine cats, the summary reactions of the neurons in the inferior colliculus were recorded as a series of evoked potentials in response to each successive click of binaurally presented series of clicks imitating movement of a sound source. It was found that the degree of movement effect depends essentially on the area of measurement of the EP. The effect of motion was found to be differently manifested in different areas of the central nucleus of the inferior colliculus. The motion effect was particularly clearly expressed in the ventral-central area of the nucleus, most frequently absent in the more peripheral areas. This indicates the existence in the central nucleus of a definite spatially-ordered organization of neurons included in the system of localization of a moving sound source. The distribution of well-expressed and moderately-expressed motion effects in the central nucleus was also found to differ. This indicates that well and moderately-expressed motion effects may involve different nerve elements. A close correlation was found between two phenomenon--the motion effect and predominance of effectiveness of contralateral stimulation relative to ipsilateral stimulation. A significant factor in formation of the motion effect is thus concluded to be the organization of monaural flows of afferentation leading to the neurons of the central nucleus of the inferior colliculus such that contralateral stimulation is more effective. References 10: 3 Russian, 7 Western.
[797-6508]

ISOPOTENTIAL LEVELS OF SOUND PRESSURE FOR MICROPHONE POTENTIAL OF INNER EAR

Leningrad FIZIOLOGICHESKIY ZHURNAL IMENI I. M. SECHENOVA in Russian Vol 70, No 3, Mar 84 (manuscript received 2 Jun 83) pp 306-310

TOKAREV, O. P. and KRUGLOV, A. V., Moscow Scientific Research Institute of the Ear, Nose and Throat, RSFSR Ministry of Health

[Abstract] Experiments were performed on guinea pigs under nembutal narcosis. An electrode was introduced to the inner ear to tap the microphone potential. The microphone potential was recorded in a sound-insulated, electrically-screened box containing the animal, an acoustical system consisting of several loudspeakers and a microphone. A new method was developed for

recording the microphone potential, consisting in recording of isopotential lines showing the level of sound pressure with continuous scanning of the frequency spectrum on a strip chart recorder. This was done by rectifying the alternating microphone potential with a detector, and using the dc voltage obtained, which was proportional to the amplitude of the microphone potential, to control the output voltage of an audio oscillator, thus compensating for the amplitude of the microphone potential at various sound frequencies. The maximum sensitivity of the ear of the test animals was found to be at 5,000 to 8,000 Hz. As sound intensity increases, non-uniformities in sensitivity of the ear are smoothed, particularly in the low and middle frequency bands. At 80 and 90 dB, the sensitivity of the ear for high frequency is practically equal to sensitivity for low frequencies, and the dynamic range of intensities at all frequencies is significantly reduced. The amplitude-frequency characteristics of the microphone potential thus reflect the functional status of the inner ear, supporting psycho-acoustical specifics of hearing primarily in the perception of loudness of sound. Figures 3; references 14: 5 Russian, 9 Western.
[797-6508]

UDC: 612.815+612.58

INFLUENCE OF COLD ADAPTATION ON TRANSMISSION OF EXCITATION IN MYONEURAL SYNAPSE

Leningrad FIZIOLOGICHESKIY ZHURNAL IMENI I. M. SECHENOVA in Russian
Vol 70, No 3, Mar 84 (manuscript received 28 Mar 84) pp 326-330

BELOUSOVA, G. P., Laboratory of Neurophysiology of Thermoreception and Heat Exchange (headed by Yu. Lupandin), State University
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[Abstract] A study is presented of the influence of cold adaptation on processes related to the transmission of excitation in myoneural synapses in various types of muscle fibers. Synaptic excitation of fibers in both slow and fast muscles, as well as the reaction of synapses in control animals and animals adapted to cold were studied. Experiments were performed in the winter using white rats under urethane narcosis. Some animals were maintained at 18 to 20°C, others had been adapted to cold -1 to -15°C for four to five weeks. In the control animals, when the vagus nerve was stimulated, fibers with different excitation thresholds were observed in the fast muscle. In the adapted animals changes in distribution of fibers over the rheobase were observed, a significant number of fibers being found with lower values and no fibers with high values of U_0 . The studies showed that in rats not cold adapted there are differences in synaptic transmission of excitation in slow and fast muscles, manifested as lability of myoneural synapses, as well as synaptic excitability of muscle fibers. After cold adaptation there is an increase in lability of myoneural synapses of both fast and slow muscles in comparison to the control. The threshold of excitability decreases with synaptic activation of fibers of both types of

muscles. The results thus indicate that long cold adaptation causes a change in transmission of excitation in myoneural synapses of both fast and slow muscles, manifested as an increase in lability of nerve-muscle synapses and synaptic excitability of muscle fibers. Figures 5; references 15: 11 Russian, 4 Western.
[797-6508]

UDC: 612.882

SENSITIVITY OF SKIN COLD RECEPTORS TO NORADRENALINE IN COLD ADAPTED AND CONTROL RATS

Leningrad FIZIOLOGICHESKIY ZHURNAL IMENI I. M. SECHENOVA in Russian Vol 70, No 3, Mar 84 (manuscript received 22 Aug 83) pp 331-338

KOZYREVA, T. V. and YAKIMENKO, M. A., Laboratory of Thermoregulation, (headed by M. A. Yakimenko), Institute of Clinical and Experimental Medicine, Siberian Department, USSR Academy of Medical Sciences, Novosibirsk

[Abstract] Comparative analysis is presented of the sensitivity of cold receptors of the skin to noradrenaline in adapted and nonadapted animals. Experiments were performed on male rats maintained at 20-22°C. Cold adaptation was performed at a temperature of +3-4°C for six weeks. Thermal stimulus of the skin was performed with a water probe with a working surface of 3 cms per tube. The temperature of the skin beneath the probe was measured by a thermocouple. Noradrenaline was administered intra-arterially in 0.2 ml saline solution at 22 or 37°C, at 0.01-0.02 ml/s. Rectal and skin temperatures in control and adapted rats were essentially identical. Administration of noradrenaline resulted in a long term increase in frequency of impulsion of most cold receptors. The results of the studies indicate that an increase in concentration of noradrenaline in the blood to above a certain level causes excitation of peripheral cold receptors. As the dose of noradrenaline increases, not only the time of reaction of the receptors, but also the number of reacting receptors increase. The experiments showed that an increase in the time of activation of receptors among control animals within increasing dose of noradrenaline is caused by an increase in the period of recovery of impulsion frequency. The sensitivity of the skin receptors to noradrenaline is increased by cold adaptation. Figures 5; references 12: 3 Russian, 9 Western.
[797-6508]

INFLUENCE OF KALLIKREIN-KININ SYSTEM ON GASTRIC MUCOSA

Leningrad FIZIOLOGICHESKIY ZHURNAL IMENI I. M. SECHENOVA in Russian
Vol 70, No 4, Apr 84 (manuscript received 31 Jan 83) pp 468-471

DOROFEYEV, G. I., VASIL'EV, V. Yu., TKACHENKO, Ye. I. and LESHCHENKO, N. M.,
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Medical Academy imeni S. M. Kirov; Department of Biochemistry (headed by
S. N. Lyzlova), Physiological Scientific Research Institute
imeni A. A. Ukhtomskiy, State University imeni A. A. Zhdanov, Leningrad

[Abstract] Work was performed in order to define the influence of the kallikrein-kinin system on the major functions of the stomach. The vein-venous difference in content of major kallikrein-kinin system (KKS) components in the blood taken from a stomach vein and peripheral vein was studied in six dogs. The influence of bradykinin was studied on the isolated mucosa of the frog *Rana esculenta* using a gastro-pH-stat. The venous blood flowing from the stomach had greater KKS activity than venous blood taken from a peripheral vein. The study of the influence of bradykinin on the isolated frog mucosa indicated that bradykinin 10^{-5} g/ml causes inhibition of gastric secretion, which once more increases after washing the mucosa and exposing it to histamine at a dose of 10^{-4} M. Active participation of the KKS in regulation of the major functions of the stomach is illustrated by the greater activity of KKS in the venous blood flowing from the stomach than from the vein in an extremity. Active kinins participate in mechanisms of inhibition of secretion of gastric juice, as indicated by the effect of bradykinin on the isolated frog gastric mucosa. Figure 1; references 11: 10 Russian, 1 Western.

[800-6508]

PRINCIPLES OF SIGNAL CODING BY DISCHARGE PATTERN IN NEURON POPULATION

Leningrad FIZIOLOGICHESKIY ZHURNAL IMENI I. M. SECHENOVA in Russian
Vol 70, No 4, Apr 84 (manuscript received 27 May 83) pp 492-500

KOVBASA, S. I., NOZDRACHEV, A. D. and YAGODIN, S. V., Department of
Higher Mathematics (headed by A. A. Grib), Financial Economical Institute
imeni N. A. Voznesenskiy; Department of Human and Animal Physiology
(headed by A. D. Nozdrachev), Leningrad State University imeni A. A. Zhdanov,
Leningrad

[Abstract] An attempt is made to construct elements of quantitative information theory of neuron systems, each position of which can be verified by experimental means available to researchers. Nontrivial conclusions of this theory could provide a theoretical basis for construction of reliable systems

of unreliable elements, Principles of coding of information by circles of stochastic dependence consisting of neuron populations are described. It is demonstrated that such a population can be only in strictly-defined, stochastic states determined by various numbers of rings of stochastic dependence. It is shown that a system consisting of a fixed number of neurons can encode and transmit different messages equal in number to the square root of the number of stochastic states permitted for the system. References 19: 12 Russian, 7 Western.
[800-6508]

UDC: 612.592-08:[612.123+612.122+612.115

CHANGE IN CONTENT OF PHOSPHOLIPIDS, BLOOD SUGAR AND HEMOCOAGULATION UPON LONG TERM COOLING

Moscow VOPROSY MEDITSINSKOY KHIMII in Russian Vol 30, No 4, Jul-Aug 84
(manuscript received 2 Mar 83) pp 20-22

ZHIKHAREVA, A. I., TAZHUDINOVA, S. I. and GRACHEVA, I. V., Central Scientific Research Laboratory, Tyumen' Medical Institute, Tyumen'

[Abstract] A study is presented of the content of free phospholipids and sugar in the blood serum as well as the state of the coagulation system with long-term exposure to cold. Experiments were performed on male white rats held in a chamber at 4-6°C for 5, 15, 20 and 30 days. Blood serum phospholipids were chromatographically separated into seven fractions. A sharp increase was noted, 5 days after the beginning of cooling, in the total content of phospholipids, primarily the metabolically-active fractions, especially phosphatidyl serine (PS). Blood sugar also rose. At day 15, the content of total phospholipids was somewhat lower, though 33% higher than in the control. PS was still 3.5 times higher than in the control. Blood sugar content had dropped to the same level as in the control. After 20 days, the content of total phospholipids and PS remained high (130 and 326%) and a second peak of hyperglycemia was observed. By day 30 the content of blood sugar had normalized once more, the level of total phospholipids was gradually dropping. A hypocoagulation effect was observed throughout the study, Figures 2; references 15 (Russian).
[1602-6508]

BIOCHEMICAL ESTIMATION OF INDIVIDUAL SENSITIVITY TO OXYGEN INTOXICATION IN RABBITS

Moscow VOPROSY MEDITSINSKOY KHIMII in Russian Vol 30, No 4, Jul-Aug 84
(manuscript received 4 Apr 83) pp 60-64

LUKASH, A. I., VNUKOV, V. V. and DUDKIN, S. I., Department of Biochemistry, Rostov-na-Donu State University imeni M. A. Suslov

[Abstract] A study was made to determine the variation in changes of prooxidant activity of the blood upon exposure to 0.7 MPa oxygen in vitro and the time of onset of convulsions and survival rate of animals from which the blood was taken upon exposure to 0.4 MPa oxygen. Studies were performed on 26 mature rabbits of both sexes, since rabbits are rather sensitive to the effects of hyperbaric oxygen. The mean time of onset of convulsions and survival rate divide rabbits into three natural groups varying in sensitivity to oxygen poisoning. There was no close correlation between individual sensitivity of the total organism and stability of erythrocyte membranes in blood samples. However, measurement of chemiluminescence of the H_2O_2 -luminol-variable valent metal compound system can be used to estimate the capability of a given compound to produce highly active radicals in decomposing the peroxide. Changes in chemiluminescence, in contrast to other indices, allow estimation not only of the increase in concentration of prooxidant components in the blood plasma, but also the capability of the plasma to limit actualization of their early effect. A rather close correlation with individual sensitivity was observed, proving the key role of changes in the blood in the mechanism of the toxic effect of oxygen under high pressure. Figures 3; references 11: 7 Russian, 4 Western.
[1602-6508]

UDC: 616-008.94:577.175.824]-02:615.835.12

CERTAIN HISTAMINE METABOLISM INDICES UPON EXPOSURE TO HYPERBARIC OXYGENATION

Moscow VOPROSY MEDITSINSKOY KHIMII in Russian Vol 30, No 4, Jul-Aug 84
(manuscript received 26 Apr 83) pp 83-86

KOROBOVA, L. N., Scientific Research Biological Institute, Rostov-na-Donu University imeni M. A. Suslov

[Abstract] A study was made of the influence of hyperbaric oxygenation at a pressure of 0.3 MPa (2 atm. gage) on the concentration of histamine as well as the status of the most important elements in the system of histamine inactivation - the activity of diamine oxidase and histaminopexy - the capability of blood serum protein to bond free histamine. Experiments were performed on male white rats exposed to 0.3 MPa, 60 and 120 minutes in the

chamber with an alkaline carbon dioxide absorber. The concentration of histamine in the brain, liver, lungs and blood was determined. Diamine oxidase activity was determined. Variable directivity of the change in histamine content was observed in the tissues. Statistical processing indicated two groups of animals with different types of reaction of the organism to the oxygen. When the animals are exposed to oxygen under pressure in the early stages, processes of compensatory-adaptive nature occur involving histamine. However, in animals with increased sensitivity or when the time of exposure to high pressure oxygen is increased, the level of histamine in the blood increases, one of the primary mechanisms of pathologic changes. References 16: 12 Russian, 4 Western. [1602-6508]

BRIEFS

ANTARCTIC MEDICAL, BIOLOGICAL STUDIES--The relief team at the Soviet polar station "Vostok" during their 18-month spell there will take part in medical and biological studies concentrating on man's adaptation to high-altitude conditions and his capacity for work and physiological reserves in extreme conditions. The need for such studies was prompted by the fact that, as mineral deposits in traditional locations become depleted, man increasingly turns his attention to the ocean, desert, extreme north and high-altitude areas and medical advice is needed to help people adapt themselves to unusual climates, remain healthy and retain a high capacity for work in extreme conditions. Some of the planned medical studies will aim to help polar explorers develop resistance to the shortage of oxygen. The ability to do with a smaller amount of oxygen means the ability to cope with big work loads, cold, hunger and fatigue. People in extreme conditions can also be helped with pharmaceutical preparations, including adaptogens based on natural products such as ginseng. The medical and biological studies will be conducted at "Vostok" because the station is located in what are not just extreme but superextreme natural conditions on the planet's geomagnetic pole and the pole of cold. The lowest temperature on record there is 89 degrees centigrade below zero. The station is situated at some 4,000 meters above sea level. The polar night there last half a year, making a perceptible impact on man's biologic cycles, and the rarified air there is nearly ten times drier than in the Sahara. Another factor to be taken into account is that external stimuli there are few and dull. [Text] [Moscow TASS in English 1119 GMT 31 Oct 84]

PUBLIC HEALTH

PROGRAM OUTLINED FOR PROPHYLACTIC DISPENSARIZATION OF POPULATION

Moscow MEDITSINSKAYA GAZETA in Russian 21 Sep 84 p 2

[Article by N. Burdin, chief of Oblast Health Department, Kemerovo: "All Reserves to Be Put Into Action"]

[Text] Already in the 1970's, our Oblast Health Department, together with the Department of Social Hygiene and Public Health Organization of the Novokuznetsk GIDUV [State Institute for Advanced Training of Physicians] and clinical departments of Kemerovo Medical Institute, prepared a special-target program for a change to mass scale coverage of the public with dispensary care. The first phase of this program, which has already been implemented, involved coverage with dispensary care of children, adolescents, women of child-bearing age, blue-collar workers in industrial enterprises and agriculture, students at secondary specialized and higher educational institutions.

Aware of the fact that maximum dispensary coverage of the public must not occur at the expense of drastic increase in number of medical personnel, but as a result of refined organization of forms and methods of work, we proceeded along the route of relieving physicians of routine paper work, record-keeping and checking patient appointments.

Dispensary offices with "Dispanserizatsiya" [dispensary care] information retrieval systems were opened at all city and rayon polyclinics. Such systems are designed to gather and process information about patients. Then an automated control system was developed, which made it possible to centralize information on the level of city health departments. Such a system is operating well in Novokuznetsk.

Fulfillment of the dispensary coverage program will require the active participation of the public. For this purpose, with the help of the staff of the Department of Social Hygiene and Public Health Organization of the Novokuznetsk GIDUV and laboratory of psychological and sociological studies of the Institute of Combined Problems of Hygiene and Occupational Diseases of the Siberian Department of the USSR Academy of Medical Sciences, we conducted a sociological investigation. More than 2000 questionnaires were received. Virtually all patients under observation indicated that dispensary examinations are needed and that they are instrumental in improving health; 80% of those questioned clearly stated that their health had improved.

We consider the following conclusion to be the main result of that investigation: with introduction of the Dispanserizatsiya information retrieval system and automated control system, when all work dealing with documents, records and schedule of calls [for medical attention] is assigned to paramedical personnel, there will be considerable increase in opportunity for each physician to augment the number of people subject to dispensary observation.

It was necessary to implement several organizational measures. Thus, working groups headed by chief specialists were established in our department, as part of the permanent commission for organizational and methodological management of annual dispensary services. They monitor organization of dispensary observation for different contingents among the public and patient groups. The base institutions have been approved for introduction of new organizational forms of work. Offices and departments of preventive care have been organized at polyclinics. A roster of the public was prepared, their social composition was determined and, in order to avoid duplication, determination was made of patients under observation in territorial polyclinics, medical sections and departmental therapeutic and preventive institutions. We are refining the system of continuity of dispensary work of internists, surgeons, gynecologists, stomatologists and other specialists.

We have made a comprehensive study of the capabilities and work load of stomatologists involved in mass scale preventive examinations. Each year, they examine up to 70% of the population. Qualified care is rendered not only in stomatological polyclinics, appropriate departments of polyclinics and medical sections, but in stomatological offices of hospitals, dispensaries, gynecological offices, health centers of enterprises, higher and secondary specialized educational institutions. At present, the stomatologists' task is to identify, examine and treat the remaining part of the public, i.e., the remaining 30%. For this purpose, it is planned to organize temporary stomatology offices at some polyclinics.

The Oblast Health Department has approved a "Temporary statute for annual dispensary care of the inhabitants of the Kuznetsk Coal Basin." We are expanding the front of work as a result of the fact that we are finding people who had never once in the course of a year turned to therapeutic and preventive institutions, and we call them in for preventive examinations.

Visiting polyclinics with additional staff have been organized in several rural rayons. We are putting in order the visiting work of oblast specialists. We are eliminating flaws when children are transferred to the network for adults: at present, we start preparing for this at the age of 13 years.

Since 1981, the number of people per medical uchastoks has decreased by 32%, which definitely improves the quality of dispensary care.

Consideration of reserves enabled us to revise the dates for adding to the rolls the different groups, as planned in the special program for 1980-1990. According to preliminary estimates, by 1985 100% of the children, 95% of the workers and up to 80% of the rest of the population should be covered by dispensary observation.

But dispensary services are not only examinations and treatment. They also involve improvement of working conditions for the people. We refer to both inculcation of an educated attitude toward health and adoption of a healthy life style. This is work in the realm not only of medical personnel, but party and soviet bodies, administrators of kolkhozes and sovkhozes, as well as industrial enterprises.

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CSO: 1840/1538

CHELYABINSK NURSE SHORTAGE DISCUSSED

Moscow MEDITSINSKAYA GAZETA in Russian 7 Sep 84 p 3

[Article by N. Beteva, MEDITSINSKAYA GAZETA correspondent, Chelyabinsk]

[Text] The huge edifice for health care in our oblast is close to completion. This is an excellently outfitted emergency hospital with 1000 beds, most departments of which have already been receiving patients for a long time. With the help of the Ural Institute for Advanced Training of Physicians, its specialists are caring for people in dramatic situations. But there is a problem, there is sometimes no one to take care of a rescued patient. Slightly more than 500 nurses are working there, instead of 1500. All of the departments have been designed for an 80-bed capacity. But there is only one nurse on duty sometimes in two units that are far from one another, while four are needed. Because of the shortage of paramedical personnel, fully outfitted departments for combined childhood trauma, emergency gynecology and emergency otolaryngology are not being opened.

The emergency hospital is no exception. According to data of the City Health Department, there is a shortage of about 5000 nurses for the therapeutic and preventive institutions in Chelyabinsk. By the end of the current five-year plan period approximately another thousand will be needed. The shortage is particularly acute for preschool institutions and children's hospitals, as well as surgical departments.

This cannot be considered unexpected. Already 5 years ago, our newspaper, in an article entitled "It is crowded in the Schools," raised the question of a need to have the material base of the oblast's medical schools conform to the demands, to raise annual enrollment up to 3000 people. There were plans to erect a new medical secondary school for 1200 students, with a 1074-bed dormitory in the oblast center, next to the emergency hospital. A target date for its completion had been given in the decision of the soviet executive committee of the oblast council of people's deputies--1984.

But, alas! There is still not a single brick laid for its foundation. True, over 30,000 rubles have been spent for plans and estimates, but they can be written off as being obsolete.

... The main building of the Chelyabinsk Secondary Medical School is a former fire department station. In spite of numerous repairs, one senses immediately an unpleasant odor. The surroundings are very unattractive.

"Few wish to enroll with us, particularly to study nursing. There were 163 applications at the start of the entrance examinations for 180 vacancies," we are told by V. M. Zhidkov, chairman of the admission committee and deputy director. "But even among those who are accepted, not all can withstand the difficult training. They struggle in private apartments, dash to classes from one end of the city to the other, then quit. We have no dormitory, hall, gyms or dining room. The small room where coffee and rolls are sold cannot be taken seriously as a solution to the problem of hot meals for a 1500-person student body."

Yet this school is among the ten or so largest ones in the Russian Federation. Annual enrollment is 600 people. Training is offered in five specialties: dentist, pharmacist, feldsher, midwife and nurse. This year, enrollment for a sixth specialty, "sanitary feldsher," had to be cancelled because it was impossible to provide the necessary laboratories. Yet, according to A. I. Medvedev, chief state health inspector [physician] in the oblast, as compared to the standards, more than 750 health worker positions on the intermediate [paramedical] level were simply not allocated, and there are about 1000 vacant positions. There are not enough dentists, pharmacists, but the situation is particularly alarming with regard to nurses.

Since the Chelyabinsk Medical School is a base institution, it should be the center for methodological work. But it does not have the conditions for even normal organization of the educational process, ideological education and mass sports activities. Classes are held in five adapted buildings in two shifts, from 0800 to 2100 hours. The class rooms are crowded: instead of the 5.7 square meters according to the sanitary norms, there are about 2 per student.

"I have been working for 5 years," stated L. I. Mikhaylov, deputy director for educational and training work. "And each year, for reasons independent of us, we move to another building. We move castings and other items for preclinical practice, which rapidly break down because of this. Now also, we must vacate the former building of the city's sanitary and epidemiological station, where we had been quartered temporarily."

But enough examples. It is already clear that the Chelyabinsk Medical School cannot meet the city's requirements with regard to paramedical personnel at the present time.

We are also alarmed by another circumstance: the sharp drop in interest in nursing in Chelyabinsk. Of course, instructors speak at schools and work on vocational guidance. But physicians and nurses have not visited them yet to tell about their occupation and prepare for their replacements.

One should not overlook the fact either that, with the present manpower shortage, there is some struggle between educational institutions for students. And the outfitting of an educational institution and possibility of acquiring a chosen occupation the most thoroughly is not in last place among arguments. We shall be frank and state that the comparison does not favor the medical school. In Chelyabinsk, some excellent technical schools have been built, with workshops, gyms and comfortable dormitories, where everything is provided

for harmonious development of the personality and learning a specialty. Much is being done in this respect at 6 institutes and 24 tekhnikums. And it is only the young people being trained at the medical school who are compelled to endure unjustified difficulties.

This city's public health service is experiencing more and more acutely a shortage of paramedical personnel, and nurses, who are in such a noble profession that is so necessary to people, are being increasingly scarce. Is it not time to proceed from good and proper decisions to deeds, to provide normal conditions at the medical school in its 50th year of existence?

10,657

CSO: 1840/1518

INEFFICIENT POLYCLINIC PERFORMANCE IN NOVOSIBIRSK

Moscow MEDITSINSKAYA GAZETA in Russian 7 Sep 84 p 1

[Article by G. Balakin, MEDITSINSKAYA GAZETA correspondent, Novosibirsk:
"On Saturdays... Intervention Needed"]

[Text] A letter with a complaint by residents of the left-bank region of Sovetskiy Rayon about the fact that it is difficult to get needed medical care on Saturdays served as an "invitation" to the polyclinic department of City Hospital No 3.

... The doors of the polyclinic had barely opened, and there was already a long line at the appointment desk. The only appointment clerk on duty, L. D. Nikitina, could not keep up with handing over stubs. Suddenly there was a hitch.

"There are no stubs for referral to the neurologist, ophthalmologist and otolaryngologist," she declared.

Why? After all, the polyclinic had just started its work day.

Another hesitation. Z. P. Zauzolkova, who works at one of the plants, interrupted the appointment clerk's work a third time. This is the second time she has come to the polyclinic, she has a medical certificate, yet there is no card for her in any of the filing cabinets.

"I got a sore throat, and my temperature rose. I came to a physician," she tells. "A prescription was written out for me and medical certificate was issued. It was extended by another physician. Then, for some reason, I was seen in the office for adolescents. And now the card is nowhere to be found."

The appointment clerk could not help her either. What about management?

"Maybe one of the deputies will arrive by 10 o'clock," answered Nikitina vaguely.

But by 10 o'clock, only physicians and nurses had arrived, late for work....

This is what one could observe on that day. As they say, the facts were confirmed. And I think that the main reason is poor work discipline and lack of control on the part of management.

I could not help but recall a recent visit to City Polyclinic No 25. There, five internists, two obstetrician-gynecologists, a surgeon and other specialists were seeing patients on Saturday, starting at 8 A.M. All of the laboratory services and physiotherapy department were operating.

Here, Saturday is an ordinary work day, we take days off on a sliding schedule," states T. A. Kalinichenko, chief of the third internal medicine department and secretary of the polyclinic's party office. "The stomatologist, internist and surgeon also see patients on Sundays. We see not only the residents of our housing block, but from the neighboring region."

Once more, an old truth is confirmed: Where constant attention is given to discipline there will be a conscientious attitude toward work and it will be well-organized.

10,657

CSO: 1840/1517

BOARD MEETING OF UZBEK MINISTRY OF HEALTH

Tashkent MEDITSINSKIY ZHURNAL UZBEKISTANA in Russian No 6, Jun 84 (signed to press 4 Jun 84) pp 70-71

[Text] At a meeting that convened on 23 March 1984, the board of the Uzbek Ministry of Health discussed progress in fulfillment of orders of the USSR Ministry of Health and Uzbek Ministry of Health "Preparation for Annual Dispensary Care of the Entire Population" in base territories of this republic. [Dispensary Care = Medical Screening, Dispensarization]

As a result of the work that has been done, 74% of the inhabitants of base regions were covered by dispensary services. However, the public was not worked up by a complete set of specialists with use of the required set of tests in several oblasts--Namangan, Samarkand, Kashka-Darya and Khorezm.

Dispensary coverage was delayed by flaws in health education work with the public, which is called upon to explain the purpose and objectives of annual dispensary care, and the mandatory participation in it of all of the inhabitants.

In the decision of the board, it was indicated to the healthminister of Kara-Kalpak ASSR, chiefs of oblast health departments, chief of the Main Administration of Public Health of the Tashkent City Soviet Executive Committee, chiefs of administrations and departments of the Uzbek Ministry of Health that it is necessary to complete before 1 October 1984 the preparatory work for introduction of annual dispensary care of the entire population, assure participation in this service of the staff of scientific research institutes, specialists from republic-level, oblast and city medical and preventive institutions, make efficient use of medical equipment and capabilities of the laboratory service, pay special attention to the use of cytological and colposcopic examination methods, make utmost use of the available space in hospitals, physiotherapy facilities and sanatorium-resort institutions in order to treat the patients that have been picked up by the dispensary screening.

The board also discussed implementation of additional measures to upgrade medical care for the newborn in Tashkent, Andizhan, Samarkand and Khorezm oblasts. According to the specifications in directive documents, departments are being opened for neonates and premature infants in pediatric hospitals of

this republic. The capacity of neonate departments in the republic as a whole currently amounts to almost 1600 beds, including 380 for premature babies. In major cities, the neonatological beds are broken down into surgical, neurological and infectious diseases. A neonatological brigade has been formed in the emergency service of Tashkent to transport neonate infants from maternity homes to hospitals.

However, there are some flaws in organization of medical care for neonates. In some oblasts of this republic, the work dealing with organization of departments for neonates and premature infants at central rayon hospitals is not being performed efficiently enough. Several of the newly opened departments have not been outfitted with the necessary diagnostic and therapeutic equipment. The flaws in training of neonatologists and paramedical personnel lower the quality of care rendered to infants.

With these oversights in mind, the board has instructed the health minister of Kara-Kalpak ASSR, chiefs of oblast health departments and chief of the Main Administration of Public Health of the Tashkent City Soviet Executive Committee to take necessary steps to increase the number of beds for neonates, expedite organization of self-contained specialized departments at central rayon and city hospitals, appoint the chief nonstaff neonatological specialists, assure continuity in the work of maternity homes, children's hospitals and outpatient institutions, improve organization of nutrition for infants up to 1 month of age when they are switched to mixed and artificial feeding.

The chief of the Main Administration for Cadres and Educational Institutions under the Uzbek Ministry of Health was instructed to organize in 1984-1985 cycles of classes dealing with care of neonates and premature infants as advanced training of nurses in specialized departments.

The head of the Tashkent Order of Red Banner of Labor Institute for Advanced Training of Physicians was asked to expand the teaching program in physiology of the neonate period for neonatologists.

The recommendation was given to the chief of the Administration for Medical and Preventive Care of Mothers and Infants, Uzbek Ministry of Health, to implement more intensive control of the performance of departments for neonates and premature babies, define the base for internships in neonatology, hold annual meetings dealing with timely problems of neonatology with the participation of the staff of relevant departments of higher educational institutions and scientific research institutes.

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10,657

CSO: 1840/1003

SHORTAGE OF PHARMACIES IN BAYKAL-AMUR TRUNK LINE REGION

Moscow GUDOK in Russian 4 Oct 84 p 3

[Article by Yu. Yefremov, Chief of the Pharmaceutical Administration, Ministry of Railways: "Hundreds of Kilometers for a Tablet"]

[Text] We are accustomed to considering new construction sites as a place for young people. Yes, that is so. But time moves on. For example, in the BAM (Baykalo-Amurskaya magistral') [Baykal-Amur Trunk Line] region the inhabitants there not only include young men and women, but people of an older generation as well. Grandmothers and grandfathers are going to see their children and want to be closer to their grandchildren. Many have now made this wonderful region their permanent residence.

That is why it is today and not tomorrow that we must resolve a large number of urgent social problems, including that of medical services.

How can they be resolved?

Let us take Syul'ban, for example. Here we have a very remotely located town that is now known to the whole country. Much has already been done here. We have built well equipped apartment houses, a comfortable kindergarten, a nursery, a brightly lit school, and an out-patient clinic. The clinic's chief physician, P. Us, can here a little more than two years ago with his wife who is also a medical worker. Their first child was born here, and they are now expecting their second. The medical pair started by receiving patients in the two little rooms in which they were living in the beginning. Now the clinic has a pharmacy with a large assortment of drugs and medical supplies, a dental office, a pediatrics office, a physiotherapy office... The "uazik" [not further identified] with the red cross on the porch is permanently on duty.

However, there are inconveniences. To get medicinals, one has to go as far as Novaya Chara, the location of the railway's pharmaceutical administration's pharmacy. Sometimes, one has to go even farther, to Tynda, which is 800 kilometers away.

The pharmacy warehouse in Tynda is well supplied. All the essentials are there: medicinals, bacterial preparations, vitamins, bandages and disinfectants,

chemical reagents, and sick patient supplies, surgical instruments, various devices, laboratory glassware, furniture, gowns, bed accessories...But all of this, oh, is so far away!

These kinds of warehouses are located at the Lena-Vostochnaya station and in Ust'-Kuta, at the beginning of the western sector of the BAM line. But if one takes a look at the map of the railway line, it becomes quite clear that getting there is not that easy. Again, as is the case in Tynda, the warehouses are located in temporary quarters.

This is where we come to our main problem--the lag in the construction of pharmacy warehouses along the BAM line. On paper they exist. A warehouse has been under construction in Severobaykal'sk since 1981, but over the past three year period only 32 out of the 192 thousand rubles allocated for that building has been used by SMP [sic]-607. And that warehouse is very much needed. Once opened, it would greatly facilitate the work of medical personnel in the western sector of the railway line.

One should note that no new therapeutic and pharmacy institutions of the RSFSR Ministry of Health have been opened here since the construction of BAM began, and the number of facilities that were here has been increased insignificantly. Someone might object to this criticism by saying that, after all, a central rayon hospital was built in Nizhneangarsk, and that the oblast health department hospital in Tynda was enlarged and even has a pharmacy attached to it. But surely, these are only half-measures. Again in Nizhneangarsk, a maternity home has been planned, but there still isn't one there yet.

Now the pharmaceutical administration of the Ministry of Railways has been forced to open new pharmacies in Novyy Uoyan and Taksimo. The area of those pharmacies was tripled in comparison to the previous space.

And what about the Buryat pharmaceutical administration? It has one pharmacy in the BAM region--in Nizhneangarsk. Just one for such a vast area! And as we know, the population here has grown more than tenfold in recent years.

The inhabitants of the city of Severobaykal'sk are finding it increasingly difficult to obtain medicinals. The city has only one pharmacy whereas there should be several by normal standards. That pharmacy would, of course, be sufficient for just the railroad workers, transportation builders, and their families, as would be the 150-bed hospitals and polyclinics that are there now. But we have no right to refuse medical assistance to people who do not happen to be working on the railway. That is why we have been compelled to open a 300-bed hospital on an emergency basis in temporary quarters, and open a pediatric polyclinic.

It is also essential to resolve the public health problem in the capital of the BAM region--Tynda. We have had to accommodate 500 persons in a new hospital here that was designed to have 300 beds. The two pharmacies that we have for the public are also not enough, and the two hospitals are operating on an overload schedule.

The railway builders and operators are having great difficulty in obtaining eyeglasses. The Ministry of Health has not yet opened optical dispensaries, and the railway dispensaries are located in Severobaykal'sk, Tynda, and Urgal which are separated by thousands of kilometers.

It is true that there is a place in Novyy Char for an optical dispensary, and one is being planned for Taksimo. But, unfortunately, the All-Union Medical Technology Association for more than two years has been delaying the delivery of special equipment for BAM. Now it would seem that the ice has begun to break. Three machines from Vitebsk are supposed to arrive there before the end of the current year, but they will not solve the problem because they are merely replacing old equipment. The models of eyeglass frames that are being received by our administration are so old-fashioned that it is simply embarrassing to send them to BAM.

I shall note that five local pharmacy administrations in the railway region are receiving five million rubles for medicinals in short supply, bandages, and eyeglass frames for BAM construction workers, and have reported to the Main Pharmaceutical Administration of the RSFSR Ministry of Health that those materials were sent to their destinations. But that does correspond to reality. Because of the lack of a pharmacy network, all of these goods are sitting in Chita, Irkutsk, Blagoveshchensk, Ulan-Ude, and Khabarovsk. And this is happening at a time when the USSR Ministry of the Medical Industry for a number of years in a row now has not increased funds for railroad workers, and has in general "frozen" funds for most medicinals in short supply. In a word, almost everything is given over to the oblast pharmacy administrations. Specific appropriations have been made for medical goods which, as we have noted, are not reaching BAM residents. Therein lies the breakdown in medicinal supplies. We have on a number of occasions taken this matter to the USSR Ministry of the Medical Industry, but no measures are being taken there,

The rather inconvenient manner in which most medicinals are delivered to pharmacies is also being exacerbated in that an entire year's plan arrives at one time. This is of course profitable and convenient for the plants supplying those goods, but what a severe burden such deliveries are for the pharmacy personnel!! Annual stocks of medicinal preparations must be stored, as a rule, under special conditions, but the normal quota of merchandise stock in pharmacies is usually always at the limiting point. As a result, the pharmacies come out to be the losers. They make large interest payments to the bank for credit and sustain groundless losses because of the expired shelf life of the medicinal preparations being stored.

We know that pharmacies are obligated to have on hand a wide assortment of medicinal preparations for the public and therapeutic institutions. But how are they to be made?

In a word, the current situation with respect to the development and enlargement of the public health institutions along the BAM line cannot be tolerated. This problem must be resolved quickly through the active participation of the Irkutsk, Chita, and Amur oblispolkoms, the Buryat ASSR Council of Ministers, and the Khabaroysk krayispolkom. It is essential to provide for the opening of supplemental pharmacies, new polyclinics, and hospitals in these inhabited regions. And this is a matter of concern not only for the Ministry of Railways, but for other ministries and departments which have an interest in the very rapid development of this region.

6289

CSO: 1840/1533

CURRENT NURSING PROBLEMS

Moscow KOMSOMOL'SKAYA PRAVDA in Russian 21 Sep 84 p 2

[Article by O, Nikolayev, physician: "How to Find a Nurse (Medsestra)"]

[Text] A notice that has yellowed with age hangs near the entrance of the clinic. Nurses and orderlies [sanitarki] are needed...But alas, the only ones visiting the personnel department are those needing compulsory labor, i.e., those who had just graduated from school. And in the clinic, the problem is most acute: there is no one on duty, with one nurse for two posts. This causes patient complaints, neglected work, endless mistakes, etc.

Just 20 years ago, in order to go to a secondary medical school (and this was a tekhnikum), it was necessary to pass a competitive examination. And now? Supplementary recruitments, agreements, all sorts of promises such as "We have a theater group operating in our school," and, nevertheless, the auditoriums are half empty. Students from the secondary medical school are getting practical training in the clinical hospital where I work. Sometimes you look at one of these future nurses and marvel. What is going to happen with her?

She has not the slightest interest in work, and her concept of medicine is limited to a white coat and flowers from the patients. I ask her why she went to school. She answers that she studied in a PTU [occupational and technical school], could not cope with it, was expelled and had to study somewhere (her mother insisted), and so she went to secondary medical school. Where else could you get in so easily!

I suggest that these words of mine will bring forth a storm of indignation from secondary medical students, but I am ready to answer anywhere and to anyone that there are more of these students entering those schools every year. What will it be like in 5, 10, 15 years? Some "wise" chief came up with the idea that orderlies' duties could be carried out in a nurse's work time, giving her a 30 percent salary increase for this. The nurses went for this willingly. Indeed, a 30 percent increase of their salary is appreciable. But what happens: there is an addition to salary, but there is also a continuous route from floor rags and toilet washing to sterile syringe and bandage. And this all goes on in addition to the burden of the principal work.

Many of them work at a time-and-a-half rate, and this duty goes on day after day. What about a personal life, and what about the family and children?

It is a secret to no one that the nurse and orderly nurse the patient back to health. Let us be frank: things will not work out for physicians without sensible mid-level and junior personnel, but where to get them and how to keep them?

12262

CSO: 1840/001

HEALTH-RELATED BUILDINGS

Moscow PRAVDA in Russian 16 Sep 84 p 1

[Text] The first section of a republic oncological clinic has been put into operation in Riga. An oblast hospital with capacity of 1,038 beds has been built in Ryazan. The material base for a hospital for World War II invalids has been increased in Vinnitsa. A large medical complex has been built for workers of the Cheboksary Industrial Tractor Plant. New polyclinics, hospitals, ambulatoriyas and medical centers are appearing in large and small cities, in workers' settlements and villages. They serve one purpose--to create a material base for maximum complete, effective medical service.

At the 26th CPSU Congress, health care for Soviet people was named as one of the most important social tasks. The extensive program of actions in this field projected by the congress has been reinforced with resolutions of subsequent Plenums of the Party Central Committee and the decree of the CPSU Central Committee and USSR Council of Ministers "Supplementary measures for the improvement of health care for the population". Just last year, the capacity of the ambulatoriya-polyclinic group rose by more than 153,000 shift changes, and approximately 66,000 hospital beds were added.

This year, medical projects, which are being built from resources earned by All-Union Communist "Subbotniks", have to contribute a ponderable addition to structures erected with government capital investments. Among them are hospitals with capacities of 7.5 thousand beds and polyclinics with total capacity of 11.6 thousand patients a shift. In all, these are the only two sources of financing for construction of hospitals and polyclinics, which must be put into operation in 1984, issuing the impressive sum of over 1.1 billion rubles.

When Party, Soviet, trade union and economic organs give health buildings necessary attention, success is at hand. For example, in Byelorussia and Lithuania, they are consistently carrying out plans for construction and putting health projects into operation. At the same time, there is little concern about constructing new medical institutions in Turkmeniya. Builders in Kazakhstan, Moldavia, Uzbekistan and several oblasts of the RSFSR have not managed to carry out this year's semi-annual plans for erecting hospitals.

Broadening the material base of medical service also depends upon strengthening labor collectives, their initiative and persistence. It is known that today, industrial enterprises can actively participate in constructing medical institutions, owing to capital investments spent on construction of projects with production purposes. At operating enterprises, it is possible to erect therapeutic-prophylactic and pharmaceutical institutions charged to funds from social and cultural resources.

Many factories have managed to take this opportunity to actively show concern about the health of their workers and family members. However, not all of them have become familiar with the new situations, and they continue to depend basically on external aid. This year, they are sluggishly building hospitals in the system of the Ministry of Gas Industry, Ministries of Oil Industry and Means of Communication have not guaranteed to fulfill semi-annual plans for ambulatoriya-polyclinic institutions. Party and trade union organizations of industrial enterprises must give more attention to construction of medical projects. Life shows us that expenditures on creating "health shops" at enterprises not only causes people to feel well and to be in good spirits, but also contributes to an increase of work productivity.

We must also not neglect reconstruction of existing hospitals and polyclinics. At times, it receives less attention than construction of new projects. For several years now, for example, active reconstruction has not even been started on such a large therapeutic institution as the Clinical Hospital imeni S. P. Botkin, though there is great need for it.

It is time for builders to quit viewing medical institutions as minor projects. Party committees of construction organizations are called upon to direct labor collectives of building organizations to unconditionally fulfill established construction plans and to guarantee putting into operation, on time, hospitals, polyclinics, ambulatoriyas, pharmacies and enterprises for repair of medical equipment and other health projects, along with enterprises of the medical industry.

Health-related buildings in rural areas deserve special attention. Measures for socially reforming the villages are an integral part of fulfilling the USSR Food Program. We must further intensify the capacity of central rayon hospitals, develop inter-rayon specialized hospital departments and broaden the network of ambulatoriyas and pharmacies. It is necessary to guarantee a reliable material base for first-aid service [the skoraya pomoshch], the formation of which is now going on in the rural areas.

The Party's tireless attention to further development of health care and appropriation of considerable efforts for its improvement causes great satisfaction among Soviet people. An embodiment of the prophylactic, preventive direction in Soviet medicine is the universal system for prophylactic dispensarization of the population, which is now being prepared for operation. The preservation of workers' health in our nation is a matter of great state importance.

12473
CSO: 1840/012

ADMINISTRATION OF MEDICAL SCREENING IN URBAN POLYCLINIC

Ashkhabad ZDRAVOOKHRANENIYE TURKMENISTANA in Russian No 1, Jan 84 pp 28-30

DOVLETSAKHATOVA, O. R. and ATADZHANOVA, R. K., Polyclinic No 8, Ashkhabad;
Chair of Social Hygiene and Health Administration FUV [expansion unknown],
Turkmen Order of People's Friendship State Medical Institute

[Abstract] Medical screening [dispensarization] at the Ashkhabad No 8 Polyclinic is based on classification of the case load into 5 categories: healthy, virtually healthy, compensated illness, subcompensated illness, and decompensated subjects. Although all specialists are involved in the screening program and dispensary management, the primary responsibility is borne by the therapist. Currently, the patient load at the No 8 Polyclinic falls into the following categories: 25.6% hypertension, 14.3% ischemic heart disease without hypertension; 5.7% ischemic heart disease with hypertension, 16.1% chronic gastritis, 10.7% chronic cholecystitis, 8.4% peptic ulcer, 6.1% chronic pneumonia, 5.2% rheumatism, 3.2% bronchial asthma, 2.5% nephritis, and 2.2% acute pneumonia. Careful monitoring of the subjects in the well and ill categories depends on appropriate paper work and documentation (forms No 025/V for the ambulatory patients and No 030/V for patients under dispensary management). Analysis of the documentation for 1981 revealed that 56.5% of the dispensary patients showed an improvement in their health status, 37.3% showed no change in the clinical status, 6.9% showed clinical deterioration, and 0.6% were transferred into the invalid category.

[1502-12172]

FEMALE WORKER MORBIDITY AT ASHKHABAD SILK SPINNING PLANT IMENI 8 MARTA

Ashkhabad ZDRAVOOKHRANENIYE TURKMENISTANA in Russian No 1, Jan 84 pp 39-43

CHARYYEV, O., Turkmen Branch, Scientific Research Institute on Work, USSR State Committee on Work and Social Problems

[Abstract] A survey was conducted on the health status of female workers at the Ashkhabad Silk Spinning Plant imeni 8 Marta, covering the 3 year period 1979-1981. The survey revealed that 50% of the subjects suffered from cardiovascular diseases, 6.66% from respiratory diseases, 10.0% from gastrointestinal complaints, 6.67% from dermatologic problems, 6.67% from sensory and other neurologic disorders, 10.0% from skeletomuscular and connective tissue diseases, and 10.0% from other afflictions. The actual morbidity patterns varied with age, length of work, type of work and so forth. Key factors predisposing to illness were unfavorable working conditions consisting of air pollution and the standing position required for many of the operations. References 4 (Russian).

[1502-12172]

LEGAL ASPECTS OF VENERAL DISEASE PREVENTION IN TURKMEN SSR

Ashkhabad ZDRAVOOKHRANENIYE TURKMENISTANA in Russian No 3, Mar 84 pp 6-9

KHAYRULIN, F. Ya., SORITS, M. B. and KUL'BESHEROVA, L. R., Turkmen Scientific Research Institute of Skin Diseases; Turkmen SSR Ministry of Justice

[Abstract] A discussion is presented of the legal consequences to individuals with venereal diseases who fail to comply with recommended treatment regimens prescribed by public health authorities. Article 120 of the Turkmen SSR Criminal Code states that there must be deliberate refusal to undergo treatment, rather than passive avoidance of therapy by neglect for culpability. The currently prescribed penalty calls for deprivation of freedom for terms approaching two years, assignment to corrective labor for one year, or a penalty of one hundred rubles. Difficulties in enforcement of such regulations are due to the fact that individuals guilty of noncompliance are generally of low cultural level, often lead a parasitic existence, and frequently have no fixed address.

[1504-12172]

SANITARY AND HYGIENIC ASSESSMENT OF NEW RURAL HOMES IN WESTERN UKRAINE

Moscow GIGIYENA I SANITARIYA in Russian No 4, Apr 84
(manuscript received 2 Nov 83) pp 22-24

LUGOVSKAYA, L. I., Lvov Medical Institute

[Abstract] Technical and sanitary details are presented on 1293 rural homes constructed in various areas of Western Ukraine in the period 1970-1982. Among the more pertinent details illustrating current state of rural housing are the facts that 52.2% of the homes now have brick walls (39.8% wooden, 6% stone, 2% cinder blocks), 67.05% have slate roofs (25.5% tin, 7% tile, 0.4% asbestos-cement roofing), and all the homes have wooden floors. Additional factors of importance in indicating the well-being of the population are the number of rooms per house (63.6% three to five, 34.5% two, and 1.9% one room), the presence of porches in 70% of the homes, and a living area of 13 m² or more per person in 51.4% of the homes. Municipal water is provided to 3.5% of the rural homes, and 96.5% rely on wells. Similarly, only 2.3% of the houses are connected to sewer lines, while the rest rely on outside lavatories. The absence of indoor bathrooms is one of the more serious shortcomings in the design of the new rural housing in Western Ukraine.

[1506-12172]

BECOME A BLOOD DONOR!

Baku BAKINSKIY RABOCHIY in Russian 11 Sep 84 p 4

ALESKEROV, G., candidate of medical sciences

[Abstract] The early concepts of bloodletting as a therapeutic modality go back into antiquity, and find manifestations in modern medicine in the treatment of hypertension, uncompensated forms of heart disease, pulmonary edema, uremia, and in detoxication. The concept of blood transfusion therapy represents a more recent development, and its success depends largely on voluntary blood donors. In addition to the satisfaction that blood donors derive from being good Soviet patriots and engendering camaraderie, there also are direct physiological benefits to the donors. Thus, for example, donation of even small quantities of blood--on the order of 200 to 400 ml--improves physical and mental performance, appetite, sleep, and cardiovascular function. A number of families can be cited in Baku where blood donation is an established family tradition, with a number of family members donating regularly. The Soviet Government has recognized the contribution to Soviet society that such individuals (recognition expressed in the form of liberal leave and rest policies with pay in connection with blood donation) and has instituted a number of awards to bring public recognition to such individuals. An individual who has made five donations receives the

"USSR Donor, 3rd Degree" medallion, while individuals who have made more than 15 donations receive the "Honorable Donor of USSR" medal. For truly outstanding donors the Soviet Government has reserved the coveted "Pirogov Medal".
[1532-12172]

PUBLIC HEALTH SERVICE IN SIBERIA

Moscow PRAVDA in Russian 6 Aug 84 p 3

SAPOV, V., PRAVDA correspondent Altay Kray

[Abstract] This article briefly describes the network of medical institutions in Altay kray. The state is making significant capital investments in the construction of public health facilities in Altay kray. However, there are complaints concerning the quality of plans generated by "Altaygrazhdanproyekt" Planning Organization and lagging public health services for rural residents. The villagers can receive only 10 to 15 types of polyclinic services at rural hospitals, as opposed to 35-50 in the cities. Many rural hospitals are little more than huts poorly staffed with nurses and specialists. There are virtually no emergency medical services available in rural areas. It is the custom for rural residents to wish each other good health when they meet. (How do you feel, Sibiryak?) The author suggests that considering the status of public health services in Altay kray, this is a practice worthy of continuing.
[821-6508]

UDC: 613.636-07:612.336.31

QUANTITATIVE COMPOSITION OF INTESTINAL MICROFLORA-1: CRITERION OF HYGIENIC STANDARDIZATION OF BIOLOGICAL PREPARATIONS

Moscow GIGIYENA TRUDA I PROFESSIONAL'NYYE ZABOLEVANIYA in Russian No 5, May 84 (manuscript received 2 Aug 83) pp 37-38

KVIYATKOVSKAYA, I. Ya., Medical Institute, Riga

[Abstract] Results are presented from a multi-year study concerning the possibility of recording quantitative changes in intestinal microflora as a criterion of harmful effects of exposure to products of microbiological synthesis such as feed protein, enzymes, antibiotics, biological fertilizers and biological means for plant protection. The author's studies over several years using thousands of intact white mice yielded quantitative indices representing the normal relationship of the main species of micro-organisms in the animals. Deviations from these indices are considered a state of dysbiosis. The intestinal microflora have been found to be highly sensitive to harmful environmental factors. References 9: 6 Russian, 3 Western.
[1607-6508]

PREVENTION OF ALCOHOLISM

Moscow MEDITSINSKAYA GAZETA in Russian 31 Aug 84 p 4

SAVCHENKO, L., senior scientist associate, All-Union Scientific Research Institute of General and Forensic Psychiatry imeni V. P. Serbskiy, candidate of medical sciences and VALENTIK, Yu., junior scientist

[Abstract] One problem in treatment of alcoholics is that many do not seek medical assistance until the disease is in the second stage. It is better to treat alcoholics as soon as the first symptoms, such as attraction to alcohol, appear. A sure sign of the first stage of alcoholism is a loss of control concerning the quantity of alcohol consumed. The desire to continue drinking strengthens immediately after the first drink is taken. The alcoholic hastens to pronounce toasts, encouraging others to drink to the bottom, and shows initiative in going after more wine. Memory disorders following drinking bouts are possible in this first stage. Though some of these symptoms may appear in social drinkers, when observed in combination they indicate the first stage of alcoholism and the need for immediate treatment.

[1629-6508]

UDC 615.838:008

INDEPENDENT VACATIONERS AT CAUCASIAN BLACK SEA RESORTS: CURRENT STATE AND PLANNED IMPROVEMENTS IN SOCIAL AND MEDICAL SERVICES

Moscow SOVETSKAYA MEDITSINA in Russian No 9, Sep 84
(manuscript received 20 Feb 84) pp 62-65

ROMANOV, N. Ye., professor, BAKLYKOV, L. I. and YUSUPOV, M. Yu., Sochi Scientific Research Institute of Health Resort Science and Physical Therapy; Anapa Territorial Soviet for Trade Union Health Resort Management

[Abstract] A demographic analysis was conducted on independent vacationers visiting Sochi, Anapa and Gelendzhik, with a view toward using such data in improving the recreational and health services available to this contingent. Analysis of responses obtained on questionnaires showed that 61.7% of the vacationers traveling independently were office workers, engineering and technical personnel, and 26.8% were laborers. Agricultural workers accounted for less than 0.6% of such vacationers, due to the demands of summer work at farms. Families with children generally prefer Anapa. Approximately 26% of the vacationers come from central RSFSR, 15.8% from Siberia, the Far East, and the Urals, 16.7% from Southern RSFSR, 12.9% from Ukraine, and 12.4% from the Northern European part of the RSFSR. Clinical evaluation of children has shown that such vacations engender marked improvement in 9.8% of the children with recurrent bronchitis, and moderate improvement in 86.6% of the children. Data of the type indicated here, on the approximately seven million independent

vacationers visiting the Caucasian coast of the Black Sea per year can be utilized in planning improved health and communal facilities for this group of vacationers.
[1545-12172]

UDC: 614.1:312.1

INITIAL STAGES OF FEMALE REPRODUCTIVE FUNCTIONS

Moscow ZDRAVOOKHRANENIYE ROSSIYSKOY FEDERATSII in Russian No 7, Jul 84
(manuscript received 4 Oct 83) pp 13-15

TOL'TS, M. S., OBERG, L. Ya. and SHISHKO, O. A., Perm' Medical Institute,
Perm' Oblast Statistics Administration

[Abstract] The reproductive function of women is performed in several stages, the first involving marriage and the appearance of the first child. Today, registration of the marriage frequently occurs after the appearance of the first child, so that the two events are interconnected. These "forced" marriages are one reason for the instability of young marriages. This article analyzes the actual sequence of the reproductive function of mothers giving birth to their first child. Abortions and stillbirths are excluded from the analysis. It was found that 72.8% of pregnancies end in birth. The 20-24 year age group has the lowest percentage of abortions. Pregnancies out of wedlock result in the highest number of abortions. Over 65% of these women consider themselves actually married, however. The absolute majority of first pregnancies begin out of wedlock. A statistical analysis indicates that more statistical information should be gathered in the field. In particular, cards reporting interruption of pregnancy should be supplemented with information on the level of education of the woman and time she has lived at her present address. This will allow a deeper analysis of the significance of these factors in the results of pregnancy. References 5 (Russian).
[868-6508]

UDC: 615.47.03:54.011.46

INCREASING EFFECTIVENESS OF USE OF MEDICAL EQUIPMENT

Moscow ZDRAVOOKHRANENIYE ROSSIYSKOY FEDERATSII in Russian No 7, Jul 84
(manuscript received 10 Aug 83) pp 5-9

PAKHARIN, V. I., Rostov Oblast Health Department

[Abstract] The operation of the Oblast "Medtekhnika" administration, which employs 600 persons and is responsible for acquisition and distribution of medical equipment in Rostov oblast, is described. A special commission has been created in the oblast health department under the chairmanship of

the deputy chief. This commission of 11 persons includes employees of "Medtekhnika" and monitors the utilization and distribution of medical equipment in the oblast. The commission is concerned both with distribution of newly-acquired equipment and redistribution of older equipment. There is a permanent exhibit of medical equipment in the oblast to help medical workers become familiar with electronic medical apparatus, featuring over 100 samples of apparatus, reference literature and a consulting engineer. Rostov clinical hospital organizes training of medical personnel in the proper use and care of medical equipment. There have been two exhibits of medical equipment manufactured by CEMA member nations since 1976. Each was visited by more than 9000 medical workers.
[868-6508]

UDC: 614.1.312.28

FUTURE WORKING LIFE DURATION

Moscow ZDRAVOOKHRANENIYE ROSSIYSKOY FEDERATSII in Russian No 7, Jul 84
(manuscript received 10 Feb 83) pp 24-27

VIRGANSKAYA, I. M., Department of Social Hygiene and Organization of Public Health (headed by corresponding member USSR Academy of Sciences Professor Yu. P. Lisitsyn), Second Moscow Medical Institute
imeni N. I. Pirogov

[Abstract] Analysis of age and sex indices indicates that in recent years the mortality of working age males has increased. This article attempts to analyze the trend in mean duration of life of males over the period from 1965 through 1982. Analysis of biometric functions of survival tables shows that the mortality of males has unfavorable dynamics, accompanied by a decrease in the mean duration of life from 65.22 to 64.31 years. By 1982, 6.1% fewer men were surviving to retirement than in 1965. The dynamics of mean survival time were studied assuming the absence of each of the main causes of death, confirming that circulatory disease is the major reason for the reduced duration of life. Secondary causes the trauma and poisoning. Reduction in these causes of death depends not only on public health service organizations, but also on the population itself. This will require increased health education among the population. References 3 (Russian) as footnotes.
[868-6508]

DECREASING JOB INJURIES NOT INVOLVING LOSS OF WORKTIME

Moscow ZDRAVOOKHRANENIYE ROSSIYSKOY FEDERATSII in Russian No 7, Jul 84
(manuscript received 10 OCT 83) pp 34-36

POSNYY, V. F., Zaporozh'ye

[Abstract] 869 Cases of minor injuries occurring between 1975 and 1979 at open pit mines, beneficiation plants, sintering plants and other shops at a manganese enterprise in the Ukraine were analyzed. It was found that 80 to 85% of all production injuries are minor (nonlost time) injuries. The injury rate was 166.6 per 1000 workers, the rate decreasing by 12.4% between 1975 and 1979. There was a direct variation between time lost to infected wounds of the fingers, skin and subcutaneous tissue and minor injury rate. 86.2% of minor injuries occurred in men, 13.8% in women, primarily due to the differing nature of their work. The injury rate is highest for workers 35 to 39 years of age, lower for older workers. Persons with less working experience are injured more frequently. Further reductions in minor injury rates can be achieved by improving the work of medical engineering teams, predicting small injuries, eliminating personality factors by creation of occupation graphs or groups of occupations most frequently injured, using biorhythms and development of biorhythm graphs for each worker and by development of production injury prevention algorithms.

[868-6508]

EFFECTIVE UTILIZATION OF CLINICAL HOSPITAL BEDS

Moscow ZDRAVOOKHRANENIYE ROSSIYSKOY FEDERATSII in Russian No 7, Jul 84
(manuscript received 21 Jun 83) pp 43

MATOVSKIY, I. M., Chelyabinsk

[Abstract] A system of daily monitoring of the use of available beds at Chelyabinsk City Clinical Hospital No. 1 has led to an increase in the average number of days occupied from 303 per year to 338 per year in 5 years. Utilization of available beds has been made a subject of socialist competition. Department heads are trained in the economic aspect of utilization of available beds, to avoid reduced bed turnover or idle beds. Study of the schedules of hospital personnel has revealed the possibility of treating patients every day, including Sundays and holidays, to further increase utilization of available beds. In 1982, each bed was occupied an average of 350 days, while the mean duration of a hospital stay decreased from 15.4 to 13.5 days, the pre-operational stay from 2.8 to 1.6 days, number of patients per bed per year increasing from 21.9 to 25.8.

[868-6508]

MEANS OF IMPLEMENTING MEDICAL-SOCIAL TASKS OF FOOD PROGRAM

Moscow SOVETSKOYE ZDRAVOOKHRANENIYE in Russian No 6, Jun 84
(manuscript received 23 Sep 83) pp 14-17

KAMALOV, M. Kh., GOLUBEV, L. V., PETROV, M. Ye., SAYFUTDINOV, V. A. and YUZHANIN, V. V., Bashkirian Republic Clinical Hospital imeni G. G. Kuvatov (chief physician - honored physician of the RSFSR and Bashkirian ASSR, doctor of medical sciences M. Ye. Petrov)

[Abstract] A long-term program for development and improvement of medical services provided to the rural population has been developed in the Bashkirian ASSR. The unification of public health in the cities and surrounding rural regions, strengthening of the material-technical base of rural public health by the construction of central rayon hospitals, organization of specialized departments and offices to replace small capacity non-profitable divisions and fixed beds has allowed the creation of a broad base of therapeutic-prophylactic institutions with a total capacity of 5630 beds. Remote electrocardiographic diagnosis with data transmission to the republic clinical hospital was set up in 1979. A 100 bed rehabilitation hospital was set up in 1981. Recent years have seen work on improvement of dispensary services. Great attention is given to work by traveling teams in the field. All medical-social tasks related to the food program are solved in cooperation with the sanitary-epidemiologic services, which is represented in traveling medical brigades. Teams go into the rural regions three times per year to provide practical assistance of the organization in conduct of medical-sanitary examination of the population during large scale agricultural operations.

[855-6508]

CONDITIONS OF LABOR AND LOST WORKING TIME OF AGRICULTURAL MECHANIZATION SPECIALISTS

Moscow SOVETSKOYE ZDRAVOOKHRANENIYE in Russian No 6, Jun 84
(manuscript received 23 Nov 83) pp 20-25

GALUZOVA, V. G., Saratov Scientific Research Institute of Rural Hygiene (directed by candidate of medical sciences V. F. Spirin)

[Abstract] The increase in power and speed of agricultural machinery often results in an increase in the level of noise and low frequency vibrations, and an increase in heat liberation, dust production and pollution of the working area with harmful gases. This has resulted in an increase in occupational disease among agricultural workers. This article presents data from an analysis of lost time morbidity of tractor operators, combine

operators, truck drivers, repair shop workers and field team workers in comparison to economic and administrative workers. It is found that there is a general tendency toward reduced lost time morbidity of mechanical operators. Conditions of labor, sanitary conditions, living conditions and provision of preventive medical services are most important in development of lost time morbidity. Prophylactic and health improvement measures are needed due to the increased occupational disease risk resulting from the operation of modern farm equipment. References 13 (Russian).
[855-6508]

UDC: 614.2(47+57):008

EXPERIENCE OF COMBINED SCIENTIFIC DEVELOPMENT OF STAFFING NORMS FOR PUBLIC HEALTH

Moscow SOVETSKOYE ZDRAVOOKHRANENIYE in Russian No 6, Jun 84
(manuscript received 5 Jan 84) pp 25-29

ROGOVOY, M. A.

[Abstract] The job of standardizing the labor of public health workers can be formulated as follows: improve standards and, based on scientifically well-founded time norms, develop staffing standards for medical, pharmaceutical, pedagogic and other personnel, systematically restudying obsolete and introducing new progressive standards corresponding to today's level of medical science and technology, the organization of labor at leading institutions. It is the purpose of the system of staffing standards to establish the maximum number of persons needed to perform certain volumes of work in public health institutions. Efficient utilization of personnel, development and utilization of internal reserves, and savings of materials and labor must be considered. All of these problems have been reflected in the standards for development of documents and materials for standardizing the labor of workers in public health institutions. This document creates the basis for research in the area of staffing standards, determining the sequence of development of methods and stages in the performance of studies. Certain shortcomings are noted in this area of operations, including unsatisfactory performance of certain studies such as the problem of determining the demand of the population for various types of medical services, insufficient development of theoretical aspects of standardization of the labor of public health workers and insufficient development of psychophysiological studies.
[855-6508]

METHODS FOR PLANNING AND ESTIMATING EFFECTIVENESS OF UTILIZATION OF HOSPITAL BEDS

Moscow SOVETSKOYE ZDRAVOOKHRANENIYE in Russian No 6, Jun 84
(manuscript received 12 Dec 83) pp 29-35

SHCHERBAKOV, V. N., All-Union Scientific Research Institute of Social Hygiene and Organization of Public Health imeni N. A. Semashko, USSR Ministry of Health, Moscow

[Abstract] The author feels that the criterion of most effective use of hospital beds is most complete satisfaction of the demands of the population for qualified hospital services. Effectiveness should be expressed as improvement of the final results of the activity of a hospital--increasing the number of hospitalized patients who receive high quality medical services. A distinction is drawn between extensive (quantitative) and intensive (qualitative) means of increasing the effectiveness of utilization of hospital beds. The extensive means is by increasing the number of hospitalized patients by increasing the number of days of use of each bed during the calendar year. The intensive means is by increasing the effectiveness of utilization of each day of hospitalization. A method is suggested for planning the use of hospital beds in a specialized department, based on the balance method of planning establishing the optimal proportions between the number of hospitalized patients, the number of beds, time of their use and idle time. An example is presented of calculating the actual additional numerical results from utilization of hospital beds in a year. Guided by the results of a deeper analysis of the quality of medical services, administrators of hospitals and services can reveal internal reserves for increasing the effectiveness of utilization of hospital beds and develop a system of measures to utilize the reserves.

[855-6508]

USE OF CRITERION OF AGREEMENT IN PUBLIC HEALTH PRACTICE

Moscow SOVETSKOYE ZDRAVOOKHRANENIYE in Russian No 6, Jun 84
(manuscript received 13 Feb 84) pp 36-38

VORONENKO, Yu. V., docent, Department of Social Hygiene and Organization of Public Health, Kiev Medical Institute (headed by Professor A. A. Grando)

[Abstract] The purpose of this study was to develop and illustrate on a specific example the possibility of statistical analysis of the reliability of seasonal or other cyclical changes in morbidity, frequency of injury, number of hospitalized persons, etc., based on the χ^2 criterion, a simple but rather powerful criterion for evaluation of the distributions of random quantities. The example used is the relative frequency of arrival of burn

patients at a hospital for various days of the week. It is found that the fluctuation of intensity of hospitalization of burn patients by days of the week is statistically reliable. References 14 (Russian).
[855-6508]

UDC: 614.256.5+613.62:619.23

CONTEMPORARY OCCUPATIONAL PATHOLOGY OF MEDICAL WORKERS

Moscow SOVETSKAYA MEDITSINA in Russian No 7, Jul 84
(manuscript received 25 Feb 82) pp 66-69

ASHBEL', S. I., professor, Gorkiy Scientific Research Institute of Labor Hygiene and Occupational Diseases, RSFSR Ministry of Health

[Abstract] A study was made of the health status of 558 medical workers examined and treated in the clinics of the author's institute for occupational diseases caused by contact with medicinal preparations. In 90% of cases pathologic changes were allergic in nature, predominantly eczema, dermatitis, edema and rash, less frequently allergic problems in the organs of respiration. Toxic-allergic changes in the nervous system were found in some cases, usually asthenoneurotic syndrome with autonomic dysfunction, less frequently symptoms of organic damage to the autonomic system. More than 1/3 of the medical workers examined were found to be carrying candida. The institute has developed a system of measures to prevent occupational problems. Antibiotics, novocain, B vitamins and mercury are among the most frequent problem-causing substances. Systematic and combined work by public health organizations, scientific medical institutions and union organizations is required to solve the problem of occupational pathology among medical workers. References 55: 49 Russian, 6 Western.
[857-6508]

UDC: 616-036.868:008

IMPROVEMENT OF MEDICAL REHABILITATION SERVICE IN LARGE CITY

Moscow SOVETSKAYA MEDITSINA in Russian No 7, Jul 84
(manuscript received 12 Nov 83) pp 75-79

ZHURAVLEVA, K. I., professor and MATVEYENKO, S. A., Department of Social Hygiene and Organization of Public Health (headed by Professor K. I. Zhuravleva), Leningrad Sanitary-Hygiene Medical Institute

[Abstract] Most researchers note three main types of rehabilitation: medical rehabilitation, occupational rehabilitation and social rehabilitation. Implementation of a combined prophylaxis program requires that restorative treatment be included in all stages of medical-social assistance. Particular

attention must be given to a differentiated approach to the use of primary and secondary prophylaxis techniques at the polyclinic level. In the first (prophylactic) stage it is important to consider the psychophysiological specifics of the patient. In the second, conclusive stage of rehabilitation, psychophysiotherapeutic methods and means for recovering working capacity and reducing invalidism must be brought to play. The modern arsenal of rehabilitative methods can bring 93 to 95% of patients with skeletomotor injury, 85 to 95% of patients with peripheral nervous system disease, 50 to 60% of heart attack patients and 25% of stroke patients, back to work after rehabilitation is completed. Multiple-profile rehabilitation centers have been set up in Leningrad. Particular attention has been given to the study of effectiveness of restorative treatment in heart attack cases. Beginning rehabilitation in a timely manner could decrease hospitalization times by 20%.
References 9 (Russian).
[857-6508]

UDC: 362.147:618

ORGANIZATION OF DISPENSARIZATION FOR FEMALE POPULATION AND HEALTH IMPROVEMENT

Alma Ata ZDRAVOOKHRANENIYE KAZAKHSTANA in Russian No 7, Jul 84 pp 22-25

KAYUPOVA, N. A., Scientific Research Institute of Obstetrics and Gynecology, Alma-Ata

[Abstract] The applicable rules for provision of dispensarization [prophylactic general medical check-up] to the population require one medical per 3300 female residents over 15 years of age. This requires reorganization of women's dispensarization by creation of combined obstetric-gynecologic and therapeutic sections, and by development of specialized offices as required for various obstetric and gynecologic services. Properly-organized services for the female population provide for timely observation and treatment of women in child bearing age suffering from diseases of the internal organs. All pregnant women should be provided with obstetric services beginning early in pregnancy. The stages of observation and treatment of pregnant women are noted. Special diagnostic studies are performed at city and oblast specialized institutions as a part of normal health services. The organization of health improvement measures and therapeutic treatment is important in the overall chain of dispensarization. Fulfillment of plans and orderly performance of these service tasks, responsibility and an understanding of the important state program of provision of dispensarization services will allow the requirements for protecting the health of women to be met.
[865-6508]

OPERATING ROOM FIRE

Moscow SOVETSKAYA ROSSIYA in Russian 29 Aug 84 p 6

YAKOVLEV, V., Editorial Board

[Abstract] A brief description is presented of an accident in which an oxygen cylinder caused a fire in an operating room due to a defective valve which had not been maintained in a proper and timely manner. The list of errors and omissions by operating room and other hospital personnel is long and surprising: oxygen cylinders in the room next to the operating room, equipment not properly maintained and inspected, improper adjustments and more. The article emphasizes the need for strict observance of safety rules and stricter inspections.

[1597-6508]

METHOD OF ALCOHOLISM TREATMENT CLAIMED EFFECTIVE

Moscow TRUD in Russian 24 Apr 84 p 3

PETROV, A., correspondent, Feodosiya

[Abstract] Some 82 to 93% of patients treated for alcoholism at the Ukrainian Republic Narcologic Psychotherapeutic Center by physician A. R. Dovzhenko stopped drinking and have become full valued members of society. Patients are transformed virtually within a single psychotherapy session without the use of drugs. The essence of the method is: 1) only those who really want to be cured can enroll; 2) each student must abstain from alcohol for 15 days before attending; 3) the physician presents a highly emotional, very well organized 'lecture,' in which he promises to return to the students their will and their control over their own lives, telling them they will have the strength to resist alcohol and to make something of themselves. The Department of Narcology at the USSR Ministry of Health has rejected Dovzhenko's method, claiming that curing chronic alcoholism in a single lecture session cannot be taken seriously. Representatives of the Ministry admit, however, that they have not actually seen Dovzhenko in action. The reporter has, and believes in him.

[1598-6508]

PROSPECTS FOR PROVIDING DISPENSARY SERVICES TO RURAL POPULATION

Alma Ata ZDRAVOOKHRANENIYE KAZAKHSTANA in Russian No 6, Jun 84 pp 26-28

MAUSYMBAYEVA, VB. R. and VAVILOVA, L. V., Tselinograd Oblast Health Department

[Abstract] The Akmolinsk Health Department has undertaken a scientific experiment to develop a model for providing dispensary services to all rural residents. The work of providing dispensary services is to be performed in three stages: the first is preventive examination of the entire population, the second is dynamic observation of the health of the population and the treatment of patients found to be ill; the third step is to study the dynamics and estimate the condition of health of the population by performing a physical examination of everyone in the area and developing recommendations for providing comprehensive dispensary services in the area. Some statistical results of the first two stages are presented. The final stage is planned for 1985-1986, and health department physicians are now in the process of training rural physicians in interpretation of EKG and other diagnostic procedures.

[864-6508]

UDC: 612.66-053.31(-202)

INFLUENCE OF SOCIAL AND BIOLOGICAL FACTORS ON PHYSICAL DEVELOPMENT OF BELORUSSIAN RURAL NEONATES

Minsk ZDRAVOOKHRANENIYE BELORUSSII in Russian No 6, Jun 84
(manuscript received 29 Sep 83) pp 20-24

KUZ'MENKOVA, I. K., Belorussian Scientific Research Institute of Protection of Mothers and Children

[Abstract] Some 2546 single birth neonates both of whose parents were Belorussian and had constantly lived in rural areas were examined in 32 obstetric institutions in 1976-1978. Body length and mass, chest and head measurements were determined in all cases. The data were processed by variational statistics and compared with the results of similar studies in Moldavia and the Ukraine as well as the city of Minsk. Boys were found to be reliably larger than girls, second and later children larger than firstborns in both sexes. Differences observed in children from different locations indicate the need to develop local standards. There is a high correlation between body length and mass, as well as body length and measurement of chest and head, indicating harmonic development of neonates. Social position of mother has no significant influence on physical development of neonates, but children of older parents tend to be larger.

References 4 (Russian).

[866-6508]

COOPERATION OF CEMA NATIONS IN PUBLIC HEALTH

Riga SOVETSKAYA LATVIYA in Russian 30 Aug 84 p 3

[Abstract] This article presents answers by the chairman of the Permanent Commission of the CEMA for cooperation in the area of public health, USSR Minister of Health Sergey Petrovich Buremkov, to questions read by a correspondent. Areas of discussion include first, the provision of medical services for populations in member nations. The CEMA has designated a permanent commission to organize multifaceted cooperation on problems of improvement of medical services. Problem number 1 is prophylaxis. The member nations have developed a coordinated concept for multistage transition to provision of dispensary public health services for all citizens, based on the soviet model. The second discussion area was heart disease: Some 126 medical institutes of the CEMA member nations are studying the problem of heart disease, and have developed practical recommendations on a collective basis concerning new methods of prevention, diagnosis and treatment of hypertension, analysis of cardiograms, rehabilitation of heart attack patients. The third subject was international cooperation on transplants: An agreement has been signed among 6 CEMA member nations concerning cooperation in the area of kidney transplants, with a combined computer center in Prague for storage of information on techniques and sources of kidney transplants. Economics was the fourth area: The commission has prepared a list of the most necessary medical preparations and equipment for the member nations. This unique social shopping list has been used as the basis for development of cooperative production to reduce the required importation of medical products. Unutilized reserves still exist for improving cooperation of nonCEMA member nations, however.

[830-6508]

IMPROVEMENT OF PHYSICIANS SERVICES BY SCIENTIFIC ORGANIZATION OF LABOR

Moscow PRAVDA in Russian 20 Aug 84 p 7

BREDNEVA, Ye., candidate of medical sciences

[Abstract] Sometimes physicians must treat patients hurriedly in order to finish treatment in the time allotted by the working standards. A better solution would be to organize the physicians' time more efficiently, freeing them from administrative and other nonmedical tasks, as well as from medical tasks for which their qualifications are not required. Excellent results have been yielded by preliminary preparation of patients in city polyclinics before planned hospitalizations. This has reduced time spent in reexamination in the hospital by 2 to 3 days. Studies of patient flow have revealed certain hours and days more heavily loaded than others, indicating that rescheduling to smooth out the physician's work load could improve patient services. Latvia has an independent republic center studying problems of development and introduction of scientific organization of labor to public health. It is suggested that scientific organization of labor

to public health. It is suggested that scientific organization of labor departments and councils be given increased authority in medical planning, including plans for construction of medical installations.
[825-6508]

IMPROVEMENT OF AGRICULTURAL HEALTH SERVICES--ONE TASK OF NATION'S FOOD PROGRAM

Frunze ZDRAVOOKHRANENIYE KIRGIZII in Russian No 3, May-Jun 84 pp 3-7

ISMAILOV, B. I., deputy minister of health, Kirgiz SSR

[Abstract] Steps taken by the Soviet state to improve the sector principle of ambulatory and polyclinic health services have greatly improved observation of patients and the distribution of services among polyclinics and hospitals, and have reduced the duration of prehospital examination as well as hospital stays. Consultation and hospital assistance for rural residents is now provided in all stages of rural public health services. One of the most important tasks in rural public health is further improvement and development of medical services for mothers and children. The republic now has some 12,000 children's hospital beds, 5500 obstetric and gynecologic beds. There are 136 women's and 190 children's consultation offices and polyclinics. One of the tasks of the Food Program is social transformation of rural areas, including improvement of rural health services, bringing qualified medical assistance to rural workers and members of their families. The work is divided between central rayon hospitals and travelling medical services. The public health law obligates all citizens to preserve their own health and that of those around them. This means that health workers, particularly sanitary education specialists, are responsible for popularizing a healthy way of living and healthy habits.
[867-6508]

INFLUENCE OF THERAPY FOR PREGNANCY-ASSOCIATED ANEMIA ON STATUS OF NEONATES AND CHILDREN UNDER ONE YEAR OF AGE

Frunze ZDRAVOOKHRANENIYE KIRGIZII in Russian No 3, May-Jun 84 pp 35-37

KOLISNICHENKO, T. P., Kirgiz Scientific Research Institute of Obstetrics and Pediatrics

[Abstract] The author studied the condition of neonates and children in the first year of life, born to women with severe iron deficiency anemia, and analyzed the effectiveness of therapy performed. Observations included 110 children. Their condition of health was analyzed as a function of the severity of the anemia during pregnancy, types of treatment and results. It was found that therapy during pregnancy decreased the risk of obstetric and prenatal complications and the morbidity of the children during their

first year of life. The frequency of premature births and the number of neonates less than 3000 g in mass were reduced. Intranatal mortality was decreased by a factor of 4, neonatal mortality by 25%. Figures 2.
[867-6508]

UDC: 614.1:312.2-053.2+616-053.2-036.88:312.2

SOME ASPECTS OF STUDY OF INFANT MORTALITY BY FACTOR ANALYSIS

Moscow ZDRAVOOKHRANENIYE ROSSIYSKOY FEDERATSII in Russian No 6, Jun 84
(manuscript received 11 Jul 83) pp 32-34

LOPUSHANSKIY, V. G. and REZNIKOV, S. G., Department of Social Hygiene and Organization of Public Health (headed by Docent S. G. Reznikov), Omsk Medical Institute

[Abstract] Data were gathered on children who died during the first year of life in order to determine the correlation relationship between individual factors. The study included such characteristics as timeliness of medical consultation during pregnancy and regularity of subsequent observation by physicians, ordinal number and nature of birth, birth weight, age, education and social group of mother, material and domestic living conditions of the mother and constitution (height). It was found that such variables as birth weight, nature of birth, timeliness of medical consultation and regularity of observation of the mother before birth have primary influence on infant mortality. Another factor influencing neonatal mortality was found to be mother's social group.
[869-6508]

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ECONOMIC LOSS FROM LOST TIME MORBIDITY AND ECONOMIC EFFECTS OF ITS REDUCTION

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[Abstract] The economic loss to the national economy due to morbidity of workers and the economic effect of its reduction are largely determined by the cost of the products produced, making it difficult to compare these quantities for individual enterprises. The major sources of information for determination of economic loss are reports of industrial enterprises concerning fulfillment of the plan for labor on form 2T, contributions to social security (form no. 4), report on temporary working capacity loss (form 16-31) and other documents. Effectiveness of measures to decrease

morbidity can be estimated by analyzing the dynamics of the level of morbidity. Equations are presented for determination of economic gain and the cost of treatment of workers. The total economic effect is calculated as the economic effect for a given period divided by the increase in cost of treatment during the period. The economic effect of reduced morbidity at one machine building plant in 1981 and 1982 was 327,753 rubles. After considering increased costs, the net economic effect was 167,000 rubles. For each ruble invested in reduction of morbidity, 2.4 rubles in increased production were achieved. References 6 (Russian).
[1626-6508]