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JPRS-UBB-87-011

28 MAY 1987

# USSR Report

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28 MAY 1987

USSR REPORT  
LIFE SCIENCES  
BIOMEDICAL AND BEHAVIORAL SCIENCES

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AGROTECHNOLOGY

UDC 631.527.5

## HYBRID VIGOR IN SELF-POLLINATING CROPS

Minsk DOKLADY AKADEMII NAUK BSSR in Russian Vol 30, No 11, Nov 86  
(manuscript received 7 Apr 86) pp 1026-1028

[Article by L.V. Khotyleva, Belorussian SSR Academy of Sciences academician, A.P. Savchenko and L.I. Korpusevskiy, Institute of Genetics and Cytology, Belorussian SSR Academy of Sciences]

[Abstract] A method has been selected for the induction of hybrid vigor in self-pollinating crops such as wheat and lupine, that is based on susceptibility of the crops to cross-pollination. The purpose is to create an optimum balance between intragenomic (homozygotic) and intergenomic (heterozygotic) factors to assure self-renewing heterosis. Trials conducted with several varieties of wheat and lupine obtained from different ecologic and geographic regions were subjected to two or three controlled self-pollinations, yielding plants with enhanced fertility and viability. With each succeeding generation, the fractional composition of genotypes with high combination capacity increased, resulting in the formation of a population with self-renewing heterosis. In comparison with the starting parental forms, the productivity of such populations was 25% greater in the case of soft spring wheat, and 15% greater in golden lupine. References 8: 7 Russian, 1 Western.

12172/13046  
CSO: 1840/258

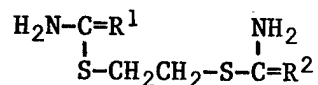
## 1,2-S,S'-ETHYLENE-SUBSTITUTED BISISOTHIUREAS WITH GROWTH INHIBITING PROPERTIES

Kishinev IZVESTIYA AKADEMII NAUK MOLDAVSKOY SSR: SERIYA BIOLOGICHESKIKH I KHIMICHESKIKH NAUK in Russian No 4, Jul-Aug 86 pp 71-72

[Article by A.M. Reynbold, G.V. Morar and D.P. Popa]

[Abstract] Starting from 1,2-S,S'-ethylenebisthiuronic bromide (I), two derivatives were obtained by reacting it with ethylchlorocarbonate at 0°, in presence of an alkaline medium: monothiuronium bromide, m.p. 145-147°C (II)

(III), m.p. 95-97°C. When tested for growth inhibition of wheat and barley seedlings, they showed activity comparable to standards--chlorocholine chloride and dimethylhydrazide of succinic acid.



where (I):  $\text{R}^1=\text{R}^2 = \text{NH}\cdot\text{HBr}$ ; (II):  $\text{R}^1 = \text{NH}\cdot\text{HBr}$ ,  $\text{R}^2 = \text{NCOOC}_2\text{H}_5$ ; and (III):  $\text{R}^1=\text{R}^2 = \text{NCOOC}_2\text{H}_5$ .

7813/13046

CSO: 1840/410

UDC 632.937.15

#### FACTORS PROMOTING EFFICIENCY OF VIRAL INSECTICIDAL PREPARATIONS

Dushanbe IZVESTIYA AKADEMII NAUK TADZHISKOY SSR in Russian No 2, Apr-Jun 86  
(manuscript received 10 May 85) pp 75-78

[Article by V.I. Mayorov, A.V. Shcherbinin, S.S. Bogachev, S.G. Spasova, M.P. Vologova and N.N. Sergeyev, All-Union Scientific Research Institute of Molecular Biology]

[Abstract] Field trials were conducted on cotton fields in Tajikistan to determine optimum conditions of application of an insecticidal viral preparation for the control of the cottonball worm. The data showed that optimum results were obtained when the insecticidal preparation contained protective fillers (zeolite and 0.5% polyvinyl alcohol) and a nutritional stimulant (0.2% sucrose). The viral preparation should be limited to give  $240 \times 10^9$  polyhedral particles/hectare, since higher doses do not improve insecticidal effects. Figures 1; references 3 (Russian).

12172/13046

CSO: 1840/324

## BIOCHEMISTRY

UDC 577.-07:617.735-089.19-092.9

### EFFECT OF VITAMINS A AND E ON STRUCTURAL AND FUNCTIONAL STATE OF RETINA LYSOSOMES

Kiev UKRAINSKIY BIOKHIMICHESKIY ZHURNAL in Russian Vol 59, No 1, Jan-Feb 87  
(manuscript received 27 Mar 86) pp 75-79

[Article by N.F. Leus and I.P. Metelitsyna, Odessa Scientific Research  
Institute of Ophthalmic Diseases and Tissue Therapy imeni F.P. Fitalov]

[Abstract] The direction and degree of expression of membrane-tropic action of vitamins E and A on retina lysosomes was studied under normal conditions and after exposure to coherent monochromatic low intensity light ( $\lambda = 632.8$  nm). In vitro experiments were performed on bovine eyes during the autumn-winter period. The in vivo experiments were done on rabbits. The results showed that vitamin E had a stabilizing effect on retinal membrane lysosomes in both the in vitro and in vivo experiments. Vitamin A acted as a labilizing agent leading to increased rate of hydrolytic reactions. Combined action of the illumination by a helium-neon laser with vitamins A and E led to increased stabilizing action of vitamin E and weakened labilizing effect of vitamin A, as shown by altered excretion rates of enzymes into cytosol. References 19: 6 Russian (1 by Western authors), 13 Western.

7813/13046  
CSO: 1840/380

UDC 541.65:546.26+576.8.097:612.1

### STUDY OF ALBUMIN IMMOBILIZATION OF SYNTHETIC ACTIVIZED CHARCOAL

Kiev UKRAINSKIY BIOKHIMICHESKIY ZHURNAL in Russian Vol 59, No 1, Jan-Feb 87  
(manuscript received 10 Feb 86) pp 100-104

[Article by S.V. Mikhalovskiy, T.A. Alekseyeva, A.M. Noskov, S.N. Tikhonova and S.V. Komissarenko, Institute of General and Inorganic Chemistry, UkSSR Academy of Sciences, Kiev; Institute of Biochemistry imeni A.V. Palladin, UkSSR Academy of Sciences, Kiev]

[Abstract] Adsorption methods are widely used in the therapy of many diseases. The best adsorbents in laboratory practice based on affinity

chromatography are immunosorbents. However, they cannot be used in a clinical setup. Synthetic charcoal adsorbents were prepared for such use. In the present work, the process of albumin immobilization on charcoal with different texture and porosity was studied by radiological methods. It was shown that, in order to be able to bind effectively high molecular weight compounds, charcoal adsorbents with optimal dimensions of mesopores must be used which facilitate transport of the adsorbate into the pores but prevent their desorption. For the case of rabbit serum albumin it was the carbon SKN. Protein binding to the matrix was much tighter when an activating agent such as water soluble carboimide was used in the process. Figures 2; references 11: 9 Russian (1 by Western authors), 2 Western.

7813/13046  
CSO: 1840/380

UDC 547.92:639.29

STEROIDAL COMPOUNDS OF SEA SPONGES. PART 7. SYNTHESIS OF SULFATES OF SOKOTRASTEROL AND HALISTANOL AND STRUCTURE-ACTIVITY RELATIONSHIP OF THESE COMPOUNDS

Tashkent KHIMIYA PRIRODNYKH SOYEDINENIY in Russian No 4, Jul-Aug 86  
(manuscript received 24 Feb 86) pp 441-445

[Article by T.N. Makaryeva, I.A. Gorshkova, B.A. Gorshkov, A.I. Kalinovskiy and V.A. Stonik, Pacific Ocean Institute of Bioorganic Chemistry, Order of the Labor Red Banner Far Eastern Scientific Center, USSR Academy of Sciences, Vladivostok]

[Abstract] Sulfated steroid polyols from Halichondriidae sponges exhibit cytotoxic activity and affect membrane penetration. A number of sokotrasterol (I) and halistanol (II) derivatives was synthesized and their physiological properties were investigated. An inhibitory effect was investigated in respect to the  $\text{Na}^+$ ,  $\text{K}^+$ -ATP-ase, the enzyme assuring an active transfer of univalent cations through the membrane. Natural metabolites (I) and (II) exhibited the highest inhibitory effect against active cation transfer through the membranes. Decreased biphilicity due to oxidation of the side chain led to a drop in the inhibitory properties. Therefore, biphilicity appeared to play an important role in this process. References 7: 3 Russian, 4 Western (2 by Russian authors).

7813/13046  
CSO: 1840/348

## CHANNEL-FORMATION BY LATROTOXIN IN LIPOSOMES

Kiev UKRAINSKIY BIOKHMICHESKIY ZHURNAL in Russian Vol 58, No 6, Nov-Dec 86  
(manuscript received 18 Jun 86) pp 50-57

[Article by I.O. Triakash, V.K. Lishko, E.I. Grebinozhko and N.I. Mishchenko,  
Institute of Biochemistry imeni A.V. Palladin, Ukrainian SSR Academy of  
Sciences, Kiev]

[Abstract] Studies were conducted on the channel-forming properties of latrotoxin in bilayer lipid membranes (phosphatidylcholine: cholesterol = 1:1) and phosphatidylcholine liposomes. Binding of latrotoxin to the bilayer lipid membrane resulted in the formation of ion channels when the toxin was present in a concentration of  $2 \times 10^{-10}$  M. However, ionic conductivity was not increased in the case of the liposomes even in a concentration of  $10^{-6}$  M. Channel-forming properties were exhibited by pronase and tryptic fragments of latrotoxin in the liposomes. These fragments were found to be incorporated into the liposomes and became insusceptible to further digestion by the proteinases; electrophoretically they were identified as 45, 52, 67, 92, 100 and 142 kDalton fragments. Low-angle x-ray scatter studies demonstrated that the tryptic fragments of latrotoxin are absorbed into the liposome membrane, leading to ion channel formation. The intact latrotoxin molecule failed to penetrate into the membrane. These observations demonstrate that channel-formation was dependent on incorporation of the fragments into the liposomal membrane, with adsorption of the intact molecule being insufficient to induce such effects. Figures 7; references 15: 4 Russian, 11 Western.

12172/13046  
CSO: 1840/322

UDC 577.155

PASSIVE  $\text{Ca}^{2+}$  TRANSPORT IN VESICULATED PREPARATIONS OF MYOCARDIAL SARCOLEMMMA

Kiev UKRAINSKIY BIOKHMICHESKIY ZHURNAL in Russian Vol 58, No 6, Nov-Dec 86  
(manuscript received 20 Dec 85) pp 70-73

[Article by S.N. Marchenko, Z.D. Vorobets and M.D. Kurskiy, Institute of  
Biochemistry imeni A.V. Palladin, Ukrainian SSR Academy of Sciences, Kiev]

[Abstract] Inverted vesicles prepared from rabbit myocardium sarcolemma were used as a model system to determine whether passive transport of  $\text{Ca}^{2+}$  proceeded via calcium channels. The data demonstrated that  $\text{Ca}^{2+}$ -calmodulin-dependent phosphorylation abolished passive  $\text{Ca}^{2+}$  transport, and that this effect was reversed by R24571 (an inhibitor of  $\text{Ca}^{2+}$ -calmodulin processes). By itself, R24571 had no effect on passive  $\text{Ca}^{2+}$  transport. In addition, passive  $\text{Ca}^{2+}$  was also abolished by the calcium channel blocker nicardipin, but was not affected by sodium and potassium channel blockers. These findings confirmed the earlier hypothesis that passive  $\text{Ca}^{2+}$  transport proceeds via calcium channels. Figures 3; references 19: 8 Russian, 11 Western.

12172/13046  
CSO: 1840/322

## BIOPHYSICS

### CELLS OPEN SECRETS

Yerevan KOMMUNIST in Russian 26 Jul 86 p 6

[Article by M. Suleymanyan and V. Arvanov]

[Abstract] Cell membrane plays an important role in regulation of cellular metabolism and interaction with external world. It is capable of distributing various ions between internal and external media, employing electric potentials. Work with membranes has led to development of a new field of science: physical-chemical biology. This work is coordinated by a Scientific Council of the USSR Academy of Sciences, chaired by its Vice-President, Academician Yu.A. Ovchinnikov. In 1979, the first All-Union Symposium on "Membrane Enzymology and Membrane Penetrability" was held in Yerevan; the topic was of sufficient interest so that it was repeated again in Yerevan last May. It was shown to be possible to alter membrane properties in desired directions, an important finding in the fields of medicine, veterinary medicine and pharmacology. In the ArSSR there are all the necessary components available for theoretical and practical work in embryology. However, the studies performed are still disjointed; there is no coordination and no cooperation among various efforts.

7813/13046

CSO: 1840/1019

UDC 547.963.4:543.424

### LOCATION OF RETINAL ALDIMINE OF RHODOPSIN RELATIVE TO PHOTORECEPTOR DISK SURFACE

Moscow BIOLOGICHESKIYE MEMBRANY in Russian Vol 3, No 1, Jan 86 (manuscript received 25 Sep 85) pp 26-33

[Article by N.G. Abdulayev, I.R. Nabiyeu, R.G. Yefremov and G.D. Chumanov, Institute of Bioorganic Chemistry imeni M.M. Shemyakin, USSR Academy of Sciences, Moscow]

[Abstract] A study of surface-enhanced raman spectra revealed the location of chromophore relative to the photoreceptor disk membrane in native and photo-bleached rhodopsin. Native and photobleached bovine external disks, adsorbed

on silver hydrosol, were used in the study. Retinal aldimine of native rhodopsin was located 5-10 Å from the cytoplasmic surface of the disk membrane while photobleached rhodopsin was located 1-6 Å from it. These findings contradicted those reported previously by Thomas and Stryer (Molecular Biology, 1982, v 154, pp 145-147). Possible sources of error in the present study are presented and discussed. Figures 5; references 22: 3 Russian, 19 Western.

2791/13046  
CSO: 1840/217

UDC 576.8.093.6

#### SYSTEM FOR RECORDING CURRENTS OF SINGLE ION CHANNELS OF BIOLOGICAL MEMBRANES

Moscow BIOLOGICHESKIYE MEMBRANY in Russian Vol 3, No 1, Jan 86 (manuscript received 3 Jul 85) pp 79-88

[Article by V.G. Zurmukhtashvili and P.D. Brezhestovskiy, Institute of Experimental Cardiology, All-Union Cardiology Research Center, Moscow]

[Abstract] A setup composed of Soviet-made units, which makes it possible to record currents of single ion channels in the range of 1 pA-1 nA at 0-3 kHz is described and discussed. The article describes criteria for selecting the input amplifier unit, the layout for recording single channels, control system elements, installation and tuning of the system and experimental use of the system. Use of the system in a study of single  $\text{Ca}^{2+}$ -activated potassium channels in the membrane of human aorta smooth-muscle cells and potential-activated potassium channels of human peripheral blood T-lymphocytes is described and discussed. Figures 7: references 9: 6 Russian, 3 Western.

2791/13046  
CSO: 1840/217

UDC 577.34.344

#### PHOTOCATALYZED OXIDATION OF WATER. PART 1. REDUCTION OF ACCEPTORS IN AQUEOUS SOLUTIONS WITHOUT ADDING DONOR ELECTRONS

Moscow MOLEKULYARNAYA BIOLOGIYA in Russian Vol 20, No 1, Jan-Feb 86 (manuscript received 1 Oct 84, revised manuscript received 15 May 85) pp 261-266

[Article by B.S. Marinov, A.B. Zhaynazarov and V.V. Gerasimenko, Institute of Biological Physics, USSR Academy of Sciences, Pushchino, Moscow Oblast; Institute of Soil Science and Photosynthesis, USSR Academy of Sciences, Pushchino, Moscow Oblast]

[Abstract] A study of the capacity of eosin to reduce electron acceptors myoglobin (protein) and hemin and methylviologen (nonprotein) under visible

light in aqueous solutions without addition of donor electrons is described and discussed. The rate of photoreduction increased in proportion to the pH of the solution. At pH  $\geq 9.0$ , there occurred rapid reduction of myoglobin for the first 5-10 minutes of illumination and the level obtained was practically unchanged during longer lighting. With decrease of the pH level of the sample, the initial rate of myoglobin reduction decreased, the trend toward saturation of reduction disappeared and the amount of reduced myoglobin decreased after 25 minutes of illumination. Control experiments showed that neither buffer molecules nor the globular part of the protein was the source of electrons for reduction of the electron acceptors. Data obtained justified the conclusion that electron donors in the process studied are water hydroxylions. Figures 5; references 16: 4 Russian, 12 Western.

2791/13046

CSO: 1840/215

CELL ENGINEERING SYNTHESIS OF HYBRIDS WITH NICOTIANA TABACUM NUCLEUS AND  
ATROPA BELLADONNA PLASTID

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 291, No 5, Dec 86  
(manuscript received 22 Oct 86) pp 1238-1240

[Article by S.G. Kushnir, L.R. Shlumukov, N.Ya. Progrebnyak and Yu.Yu. Gleba,  
Institute of Botany imeni N.G. Kholodnyy, Ukrainian SSR Academy of Sciences,  
Kiev]

[Abstract] This is a report of the first successful synthesis of a functional and fertile hybrid combining the genetic material of plants belonging to different taxonomic tribes. The protoplast fusion involved a Nicotiana tabacum mutant (chlorophyll defective, streptomycin resistant) and wild-type Atropa belladonna. The fusion resulted in the isolation of 41 colonies, of which 4 gave rise to abnormal plants, 4 led to plants identical to A. belladonna, and 33 yielded plants morphologically identical with N. tabacum. The latter contained 48 chromosomes, identified exclusively as N. tabacum chromosomes, and were photosynthetically active. Examination of the plants demonstrated that they represented somatic hybrids with N. tabacum nuclei and A. belladonna plastids. This confirmed the contention that somatic hybridization represents a cell engineering technique capable of yielding genetically novel plants. Figures 1; references 9: 1 Russian, 8 Western.

12172/13046  
CSO: 1840/345

UDC 577.15.08+[547.391.1:577.151.083

BIOCATALYTIC PREPARATION OF HYDROCARBONS, THEIR DERIVATIVES AND MONOMERS

Moscow ANTIBIOTIKI I MEDITSINSKAYA BIOTEKHNOLOGIYA in Russian Vol 31, No 2,  
Feb 86 pp 104-107

[Article by A.M. Yegorov and I.G. Gazaryan, Chemical Faculty, Moscow  
University imeni M.V. Lomonosov]

[Abstract] A review is presented on the advantages of biocatalytic processes for the production of desired hydrocarbon products, their derivatives and

monomers, utilizing various biotechnologic systems. The processes may, in principle, be classified into two categories: those that depend on hydration reactions, and those that are based on redox reaction with subsequent regeneration of NAD·H. The systems as currently developed employ either intact cells, combination of intact microbial cells and immobilized enzymes in different stages, or rely solely on isolated (immobilized ?) enzymes. Among the more efficient systems for regeneration of NAD·H is one based on *Achromobacter parvulus* formate dehydrogenase. Processes have been designed which yield desirable alcohols, aldehydes, ketones and epoxides. An added advantage of such technology is the virtual absence of side products. References 28: 6 Russian, 22 Western.

12172/13046  
CSO: 1840/330

UDC 615.355:577.152.09].014.6012

#### COMMERCIAL BIOCATALYTIC REACTORS FOR IMMOBILIZED ENZYME PROCESSES

Moscow ANTIBIOTIKI I MEDITSINSKAYA BIOTEKHNOLOGIYA in Russian Vol 31, No 2, Feb 86 pp 112-117

[Article by E.N. Tearo, E.G. Uus and A.I. Kestner, Tallin Polytechnic Institute]

[Abstract] A review is presented of the commercial reactors currently in use for immobilized-enzyme processes, along with a description of operating characteristics and the advantages and disadvantages of each type. Special consideration is given to the substrate and product inhibition problems that may be encountered, as well as to the observation that, in many cases, proper pressure adjustments improve efficiency by 15-25%. A series of biocatalytic reactors have been developed in Tallin that employ a two-phase layer in which pseudofluidization of the small-grain catalyst is attained with a percolating gas. This fact renders the hydrodynamics of the operation independent of the rate of substrate flow and prevents further reduction in size of the catalyst. Data on reactors employed in some countries for various processes are summarized in tabular form, with information on conversion rates and process efficiency. Figures 3; references 14: 6 Russian, 8 Western.

12172/13046  
CSO: 1840/330

## IMMOBILIZATION OF ENZYMES IN FIBERS AND FILMS

Moscow ANTIBIOTIKI I MEDITSINSKAYA BIOTEKHNOLOGIYA in Russian Vol 31, No 2,  
Feb 86 pp 117-122

[Article by A.D. Virnik, S.B. Krasovskaya, N.R. Kildeyeva, B.L. Biber and  
Z.G. Solomon, Moscow Textile Institute imeni A.N. Kosygin; "Khimvolokno"  
Scientific Production Association]

[Abstract] Recent developments have shown that it is possible to immobilize or incorporate various enzymes into polymeric fibers and films without loss of activity. This fact has considerably expanded the use of such fibers and films in medicine, research, and industry. Examples provided include surgical packing materials and sutures from which the active enzymes leach out to exert enzymatic debridement and antimicrobial effects. The latter has been particularly effective in the case of various gauzes incorporating such proteolytic enzymes. The enzymes are generally immobilized during polymerization, as in the case of cellulose acetate in acetone, with the enzymes retaining their activity for up to 1500 h. Data are presented on systems in which penicillinamidase, urease, trypsin and chymotrypsin have been immobilized. In addition, mention is made of the fact that a pilot plant has been designed in the USSR for the production of fibers and films with immobilized enzymes. Figures 4; references 28: 26 Russian, 2 Western.

12172/13046  
CSO: 1840/330

UDC 57.083.185+577.15.08

## BIOLUMINESCENCE ANALYSIS IN MEDICINE AND BIOTECHNOLOGY

Moscow ANTIBIOTIKI I MEDITSINSKAYA BIOTEKHNOLOGIYA in Russian Vol 31, No 2,  
Feb 86 pp 141-147

[Article by N.N. Ugarova, L.Yu. Brovko and O.V. Lebedeva, Chemical Faculty,  
Moscow University imeni M.V. Lomonosov]

[Abstract] Developments in analytical biochemistry have seen a remarkable explosion in bioluminescent techniques based on firefly and bacterial luciferase, as well as on two-enzyme bacterial systems employing luciferase in conjunction with oxidoreductase. Immobilization of luciferase has greatly increased the sensitivity and stability of such methods, and generally involves coupling to BrCN-activated carbohydrate matrices. As a result, various batch and columnar techniques have been described for the analysis of picomolar or better concentrations of AMP, ADP, ATP, NAD·H, NAD, creatine phosphokinase, formate dehydrogenase, steroid hormones, and many other biomolecules. Rapid methods developed for the determination of intracellular ATP have been used in monitoring microbial contaminants, as well as in

following microbial processes. Figures 4; references 19: 11 Russian, 8 Western.

12172/13046  
CSO: 1840/330

UDC 575.117.578.5

#### CLONING AND EXPRESSION OF PHAGE T6 DNA LIGASE GENE

Moscow BIOTEKHNOLOGIYA in Russian No 4, Jul-Aug 86 (manuscript received 18 Feb 86) pp 12-23

[Article by A.A. Zimin, P.A. Krylov and V.I. Tanyashin, Institute of Biochemistry and Physiology of Microorganisms, USSR Academy of Sciences, Pushchino]

[Abstract] DNA hybridization studies were conducted to identify a region in the bacteriophage T6 genome that was identical to that of the DNA ligase gene (gene 30) in phage T4. Subsequently, conventional genetic engineering techniques were utilized to insert this T6 region into plasmids pBR327 and pUC18 for studies on expression in *E. coli* when under control of lac promoter. The recombinant plasmids were capable of salvaging T4 amber mutants with a mutation in gene 30, and supported replication of these mutants in suppressorless *E. coli* strains. Electrophoretic determinations demonstrated that the DNA ligase of T6 and T4 had similar MW's of ca. 55 kdaltons. Expression of the T6 gene in *E. coli* led to the production of DNA ligase in a yield equivalent to ca. 2% of the total soluble cell protein. These observations pointed to the efficiency with which a minimal fragment of a T phage may be cloned in a plasmid, and its efficiency of expression under the control of a lac promoter. Possibly, the use of a more efficient promoter would provide even higher yields of DNA ligase with the T6 gene. Figures 3; references 53: 3 Russian, 50 Western.

12172/13046  
CSO: 1840/354

UDC 582.28.083.134

#### FORMULATION OF NUTRIENT MEDIUM FOR ENTOMOPHTHORA THAXTERIANA PETCH

Moscow BIOTEKHNOLOGIYA in Russian No 4, Jul-Aug 86 (manuscript received 19 Sep 85) pp 46-51

[Article by G.A. Kochkina, M.M. Skvortsova, S.M. Ozerskaya and T.N. Dryagina, All-Union Scientific Research Institute of Biotechnology, Moscow]

[Abstract] Factorial analysis studies were conducted to design a nutrient medium for *Entomophthora thaxteriana* yielding high spore yields. The cost of

the medium could be significantly reduced by the incorporation of molasses in place of glucose, and by the replacement of soybean meal by hydrolyzed 'feed' yeast and/or fish meal. The data showed that *E. thaxteriana* cultivated on such media yielded ca.  $8 \times 10^7$  spores/g of dry biomass. Therefore, the data demonstrated that replacement of 6% glucose and 1% soybean meal of appropriate levels of hydrolyzed 'feed' yeast and molasses yields a nutrient medium that supports the production of high levels of insecticidal spores of *E. thaxteriana*. References 17: 1 Czech, 11 Russian, 5 Western.

12172/13046  
CSO: 1840/354

UDC 577.115:663.14

#### EFFECTS OF PROCESSING ON LIPID COMPOSITION IN CANDIDA BIOMASS GROWN ON n-PARAFFINS

Moscow BIOTEKHNOLOGIYA in Russian No 4, Jul-Aug 86 (manuscript received 5 Oct 85) pp 52-57

[Article by M.G. Bezrukov, A.P. Kovalev, Ye.L. Khodchenko, M.G. Bystrova and Yu.Ye. Kazantsev, All-Union Scientific Research Institute of Protein Biosynthesis, Moscow]

[Abstract] An assessment was conducted on the effects of processing technology on the levels and composition of the lipid components of protein products derived from *Candida* biomass. In the case of *Candida* grown on n-paraffins, the method of disintegration had a profound effect on the parameter under investigation. Mechanical disruption of the cells led to marked degradation of the more complex lipids, resulting in high levels of free fatty acids in the final product. Following disintegration, the phospholipid content of the protein preparations decreased from 42 to 11%, and that of fatty acids increased from 4.2 to ca. 55%. Alkaline extraction at pH 8.5 and 11.5 favored a more efficient lipid extraction, particularly of the lysophospholipid fraction. Alkaline extraction in combination with isoelectric precipitation yields a final preparation with 10-12% lipids. Further purification by treatment with 50, 70 and 96% ethanol resulted in removal of 84% of the residual lipids, yielding a final protein preparation containing ca. 2% lipids. The final lipid level meets the nutritional standards that are now commonly accepted. References 9: 1 Russian, 8 Western.

12172/13046  
CSO: 1840/354

## IMMOBILIZATION AND APPLICATIONS OF LUCIFERASE

Moscow BIOTEKHNOLOGIYA in Russian No 4, Jul-Aug 86 (manuscript received 4 Nov 85) pp 82-95

[Article by N.N. Ugarova and O.V. Lebedeva, Moscow University imeni M.V. Lomonosov]

[Abstract] A review is presented of the various techniques used for the immobilization of luciferase from various bacterial sources, with the notation that immobilization on polysaccharide supports, e.g., Sepharose or agarose, remains the technique of choice. In addition, success has been obtained with immobilization of whole cells in various gels, with the system relying on the embedment of *Beneckea harveyi* cells in calcium alginate yielding preparations that retain activity for an entire day. Efficient immobilized two-enzyme systems have been devised using luciferase and  $\text{NAD(P)H}_2\text{:FMN}$  oxidoreductase. The latter has made possible assays of a variety of important biomolecules, such as steroid hormones, several kinases, glucose, FMN, formate dehydrogenase, ethanol, bile acids, and so forth. These findings and review point to the extensive applications that luminescent bacterial systems have already enjoyed in basic and clinical medical research, with the anticipation that further bioanalytical applications are to be expected. References 65: 12 Russian, 53 Western.

12172/13046  
CSO: 1840/354

## BIOTECHNICAL PROGRESS IN HUNGARY

Moscow SOVETSKAYA ROSSIYA in Russian 3 Sep 86 p 5

[Article by O. Rumyantsev]

[Abstract] Achievements of the "biotechnologic revolution" in Hungary are highlighted. A recent fair (sponsored by the Hungarian Bureau of Proteins and Biotechnology of the State Committee of Technical Development, HPR) called attention to the "Meriklon" Association and the Saint Lawrence kolkose which are making products competitive with foreign imports and expanding the inventory of agricultural and pharmaceutical agents. Some examples of possible applications of Hungarian inputs were listed: the technology of embryonic transplantations and breakdown; cloning technology used to develop resistant potato, grapevine and paprika cultures; preparation of human insulin; production of methane from sewage, etc. One of the early weaknesses of this program has been a lack of scientific cadres. One step to correct this is opening of an education center in Hedelle near Budapest. Achievements are described as steps in the realization of CEMA cooperation.

7813/13046  
CSO: 1840/1022

ORDER FOR A STOCK

Moscow PRAVDA in Russian 11 Nov 86 p 2

[Article by G. Muromtsev, Director of All-Union Scientific Research Institute of Applied Molecular Biology and Genetics, All-Union Academy of Agricultural Sciences imeni Lenin]

[Abstract] This is a popular-type article. The principle of inheritance is based on genes, components of gigantic DNA (desoxyribonucleic acid, a molecule consisting of only four relatively simple components, nucleotides). Genetic engineering, sometimes called genetic microsurgery, is capable of excising some of these genes and replacing them with others thus leading to profound genetic alterations. Although most of the genetic engineering so far is performed on viruses and bacteria, this methodology has already yielded considerable results: production of vaccines, diagnostic reagents, special bacteria capable of converting air nitrogen to proteins, etc. The next step is cellular engineering, development of tissue cultures, transplantation of embryos (especially in cattle breeding) etc. Development of biotechnology could go faster; presently it is being hampered by lack of reagents, lack of highly-qualified specialists, and of modern laboratory equipment, in short--it is hampered by inadequate material-technological resources. Figures 1:

7813/13046  
CSO: 1840/1027

PROTEIN FEED FROM HYDROGEN BACTERIA--CURRENT STATUS OF PRODUCTION

Moscow EKONOMICHESKAYA GAZETA in Russian No 50, Dec 86 p 14

[Article by V. Mikhaylov, Krasnoyarsk]

[Abstract] The theoretical foundations for the production of single cell protein for feed use were laid more than two decades ago, while the plans for practical application of this technology, i.e., production, were described by Academician I. Terskov of the Krasnoyarsk Institute of Biophysics, Siberian Department of the USSR Academy of Sciences, more than 2 years ago (EKONOMICHESKAYA GAZETA, No 28, 1984). To date, nothing has been done in the construction of pilot plants or upscaling. The various excuses offered to explain this state of neglect point to one thing: methane bacteria were in vogue, hence hydrogen bacteria were neglected (as the protein producer) for this very simple reason. As a result, the economy of the USSR continues to suffer shortages in protein feed because of inertia in implementing new technology. One bright spot has, however, appeared on the horizon. The Norilsk metallurgical plant has made plans to use this technology for the production of single cell protein feed for their own farm.

12172/13046  
CSO: 1840/274

## GENETICS

### ENZYMATIC SCALPEL AND NEEDLE FOR GENETIC SURGERY

Vilnius SOVETSKAYA LITVA in Russian 20 Aug 86 p 4

[Article by R. Martsishauskas]

[Abstract] Transfer of the genes of higher organisms into cells of micro-organisms became a reality leading to developments of new reagents for medicine, agriculture, etc. It became possible to dissect and recombine the carrier of inheritance the DNA. This is done by enzymes, which are, in effect, the scalpels and needles of genetic surgery. In the USSR, the All-Union Scientific Research Institute of Applied Enzymology has become the leader in studies of genetic enzymes. In addition to studies on restrictases, extensive work is underway on bacteriophage T-4, DNA-ligase, etc. Efforts are underway to develop further this new technology of the production of enzymes.

7813/13046  
CSO: 1840/1025

## HUMAN FACTORS

### PREVENTION OF OVERALL AND VISUAL FATIGUE

Yerevan PROMYSHLENNOST ARMENII in Russian No 8, Aug 86 pp 39-40

[Article by A.A. Israyelyan, engineering psychologist]

[Abstract] The demand for miniaturization in industry has placed considerable strain on the visual system of workers involved in microscopic manipulations. To overcome such problems, a method of autophthalmic training has been devised, in analogy to autogenic training. Autoophthalmic training is carried out in conjunction with breathing exercises to achieve the maximum in relaxation, with the entire process taking 17 min. Implementation of such a program at several enterprises has improved labor productivity by 12%. In addition to improved function of the visual system, the benefits of this technique extend also to alleviation of general fatigue.  
References 3 (Russian).

12172/13046

CSO: 1840/327

UDC 579.843.95:579.61:612.017.1]:519.86

MATHEMATICAL MODELING OF REACTION OF PLAGUE CAPSULAR ANTIGEN WITH ANTIBODIES  
OF DIFFERENT AFFINITIES

Moscow ANTIBIOTIKI I MEDITSINSKAYA BIOTEKHNOLOGIYA in Russian Vol 31, No 3,  
Mar 86 (manuscript received 16 Jul 85) pp 203-209

[Article by M.I. Levi, Central Quality Control Research Laboratory,  
Disinfection Station, Moscow]

[Abstract] Basically, the Scatchard plots of the reaction of monovalent plague capsular antigen with antibodies of different affinities were analyzed to provide models for this type of antigen-antibody reaction. The studies were conducted with monoclonal antibodies and hyperimmune equine antisera, relying on antibody neutralization tests. The data demonstrated that in antibody excess the antigen reacts preferentially with the highest affinity antibodies. Since the total concentration of such antibodies in an antiserum may constitute only a small portion of total antibodies, this may account for the relative clinical ineffectiveness of such antisera. Subsequent to the saturation of the high-affinity antibody sites, the reaction proceeds with the lower affinity antibodies on the basis of their relative affinities. Because the equilibrium constant is predicated on the dissociation rate constant, with the association rate constant remaining relatively invariable for various antibody categories, low levels of dissociation from the high-affinity antibodies results in underutilization of the low-affinity antibodies. These findings confirm studies by others on antigen-antibody kinetics, and point to the reasons for the relative therapeutic ineffectiveness of heterogenous (in terms of affinity) hyperimmune antisera. Figures 4; references 17: 9 Russian, 8 Western.

12172/13046  
CSO: 1840/331

REAGENTS AVAILABLE FOR ENDOCRINOLOGICAL EXAMINATIONS

Tbilisi ZARYA VOSTOKA in Russian 14 Sep 86 p 4

[Article by M. Dzhindzhikhashvili, special correspondent of Zarya Vostoka]

[Abstract] Reagents for radioimmunological evaluation of patients will soon be produced at the Sukhumi Scientific Research Institute of Experimental Pathology and Therapy, USSR Academy of Medical Sciences. This effort is directed primarily to assay of circulating hormones. Until recent times, the endocrinological work was limited because the reagents required were obtainable only for [foreign] hard currency. Now they are available within the country. The task at present is to learn to use these reagents properly. Most of the work is done on monkeys which model human situations very well. Recently, contacts have been made with WHO and U.S. scientists in the area of cardiology and oncology.

7813/13046

CSO: 1840/1009

MOLECULAR MECHANISMS OF ACTION OF THERAPEUTIC LOW-INTENSITY LASERS

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 291, No 5, Dec 86  
(manuscript received 30 Apr 86) pp 1245-1249

[Article by T.Y. Karu, Scientific Research Center on Laser Technology, USSR Academy of Sciences, Troitsk, Moscow Oblast]

[Abstract] A myriad of experimental data is reviewed on the effects of low-intensity lasers ( $10^2$ - $10^3$  J/m<sup>2</sup>) and short exposure times (10-100 sec) in order to arrive at an explanation for the beneficial effects of such treatment in the clinical setting. A study of the molecular effects of such low-level irradiation has shown that with the various wavelengths employed the effects persist for days. These include various subtle metabolic changes, including alterations in nucleic acid synthesis. The data would suggest that low-intensity lasers induce metabolic changes that indicate that laser radiation has a trigger function, i.e., they function as an environmental factor that, in the final analysis, affects cellular proliferation. The local therapeutic effects of He-Ne (632.8 nm), He-Cd (441.6 nm) and semiconductor (830 nm) lasers in the treatment of trophic ulcers appear to depend on their ability to induce cellular proliferation at low intensities. Since the cells in such ulcers are in the G<sub>0</sub> or extended G<sub>1</sub> stage (due to low pO<sub>2</sub>, pH, absence of nutrients, etc.), low-intensity lasers may trigger proliferation and, hence, healing. The failures observed in many experimental situations may be due to the fact that in the fresh wounds the proliferative activity of the cells has not been depressed and may be greater than normal and, therefore, not susceptible to further stimulation at that stage of the lesion. Figures 2; references 15: 8 Russian, 7 Western.

12172/13046  
CSO: 1840/345

## PHYSICAL-CHEMICAL PRINCIPLES FOR CREATION OF NEW GENERATIONS OF SYNTHETIC IMMUNOGENS AND VACCINES

Moscow VESTNIK AKADEMII NAUK SSSR in Russian No 1, Jan 87 pp 14-28

[Article by V.A. Kabanov, corresponding member of USSR Academy of Sciences]

[Abstract] Development of immunology gave people an important agent to fight various infections. Although most of this knowledge was developed from Pasteur principles, it is limited at least in two aspects: introduction of whole or parts of microorganisms represents reaction to a complex poly-component system which, in addition to producing antibodies, leads to many side reactions, and the strength of the protective reaction which is controlled by Ig genes will be different from patient to patient. Direct participants in the formation of immunity are the B- and T-lymphocytes whose specific protein receptors are capable of recognizing specific antigens. There are always enough specific B-lymphocytes but not necessarily T-lymphocytes. Some polyelectrolytes when introduced with antibodies can intensify the immune response several fold. This activity was shown to be related to their degree of polymerization. The article explained these phenomena in relationship to physical properties of polyelectrolytes and cell membranes. Too much polyelectrolyte could lead to cell death; there is an optimum concentration for each electrolyte acting as a stimulator of DNA synthesis. The mechanism of action is as follows: Ionogenic macromolecules are adsorbed by cells leading to association of membrane proteins; ionic permeability of cell membrane is increased serving as a signal for switching on the mytotic cycle. There is no need for T-helper cells any more. Figures 8.

7813/13046

CSO: 1840/1014

## LASER TREATMENT OF EYE DISEASES

Moscow VECHERNAYA MOSKVA in Russian 10 Nov 86 p 2

[Article by V. Akopyan, director, All-Union Center for Ophthalmological Lasers]

[Abstract] The USSR is one of the leaders in the use of lasers in ophthalmology, techniques that permit finely-tuned, tissue-sparing delicate operations. Various diseases have been successfully treated by such light scalpels, including cataracts, diabetic retinopathies, and atherosclerotic changes. Soviet leadership in this field is also acknowledged by the fact that Soviet surgical lasers have been granted patents in 13 foreign countries. Recently, a multimodality Liman-2 laser has been developed that will further expand this branch of microsurgery. In order to expand ever further the use of this technology, plans have been made to establish an additional 30 ophthalmological laser centers in the USSR by 1990.

12172/13046

CSO: 1840/273

## MEDICINE

### BRAIN TISSUE SURGERY

Riga NAUKA I TEKHNIKA in Russian No 17, Dec 86 pp 11-13

[Article by B. Petkevicha]

[Abstract] Recent advances in neurosurgery are described as performed at the Republic Neurovascular Center of the LaSSR Ministry of Health. It is here that the roentgeno-endovascularization surgery was perfected, especially the technique of balloon dilation of brain arteries for ischemic shock, sometimes called angioplastics. In this article, brain injuries are described in general terms and some surgical procedures are explained. Then in detail, step by step, the procedure of balloon dilation is explained in lay terms. Interestingly, the balloons are tailor-made directly at the Institute for each patient prior to surgery. This method has other applications: reconstruction of blood circulation arrested by emboli and blood clots, removal of subarachnoidal hemorrhages, occlusion of aneurismic sacs, etc. A technique developed by Ya. Kupche is the fusion of brain arteries using argon laser which results in collateral blood circulation. These procedures are carried out under a surgical microscope. Figures 3.

7813/13046

CSO: 1840/382

### GNOTOBACTERIAL CHAMBER FOR WOUND ISOLATION

Moscow LENINSKOYE ZNAMYA in Russian 2 Oct 86 p 3

[Article by V. Yashin, physician]

[Abstract] This is a report on a sterile air bandage that markedly speeds healing. The innovative gnotobacterial chamber was developed at the Child Surgery Department of the Second Moscow Medical Institute imeni N.I. Pirogov. The unit, in a clear plastic covered chamber, includes gloves for treatment so that outside contamination is isolated as completely as possible. Healing has been found to occur 2-3 times faster than with conventional bandaging, both with extensive wounds and with major burns. The isolated chamber has also been used as a mobile operating room. In this application,

sterilized surgical instruments in a sterile container are placed inside the plastic chamber so that no pathogenic microorganisms can enter during the surgical procedure. A related development is a complete living chamber into which sterile food and air can be introduced. Medical personnel enter this "tent" only in suits that are similar to those used by astronauts, except they are also sterile. This general sterile chamber is intended for newborn and children with staphylococcic infections.

12131/13046  
CSO: 1840/171

UDC 615.488+615.468.6].03:616-073.755.4

#### MEDICAL TEXTILE MATERIALS WITH RADIOCONTRAST PROPERTIES

Moscow KHIRURGIYA in Russian No 6, Jun 86 (manuscript received 16 Jan 85)  
pp 114-117

[Article by L.G. Vlasov, K.F. Paraskevova, I.A. Movshovich and O.M. Mukhamedov, All-Union Scientific Research Institute of the Textile and Clothing Industry; TsITO [expansion unknown; Central Institute of Traumatology and Orthopedics?] imeni N.N. Pirogov, Moscow; Chair of Traumatology, Orthopedics and Military Field Surgery, Turkmen Medical Institute, Ashkhabad]

[Abstract] Recent developments have shown that one promising approach to radiocontrast medical textiles consists of using ion-exchange fibers for binding metal ions. Highly promising results have been obtained with the use of polypropylene fibers grafted with polyacrylic acid (70-80 wt%), which offers a material with  $-COO^-$  for reaction with salts of heavy metals. Used in sutures and various endoprosthetic materials, such filaments have offered clearly detectable features on x-rays since the optical density difference is on the order of 0.01-0.02 units. Figures 1; references 5 (Russian).

12172/13046  
CSO: 1840/312

#### INJECTION TREATMENT FOR MYOPIA

Moscow VECHERNAYA MOSKVA in Russian 24 Dec 86 p 2

[Article by I. Petrov]

[Abstract] A novel injection method has been developed at the Institute of Eye Diseases imeni Helmholtz for the treatment of myopia in children, as explained by its deputy director Eduard Sergeyevich Avetisov. The approach consists essentially of injection of a special polymer solution into the retrobulbar space. In time, the polymeric coat on the posterior portion of the globe is replaced by additional scleral tissue. The 'ruggedized' eyeball

is less subject to undue elongation and results in arrest of myopia. This procedure has been used successfully in more than 300 cases, with further progression arrested for up to 4 years. Other methods are also employed in the management of myopia. Special eye exercises have been developed which correct and facilitate proper accommodation. Such eye exercises have been shown to be virtually 100 percent effective in preventing the onset of myopia in schoolchildren. The USSR Ministries of Health and of Education have recommended that this method be used in schools to reduce visual stress.

12172/13046  
CSO: 1840/272

UDC 615.473.2(082.8)(47+57)

#### NEEDLE-FREE INJECTOR

Moscow RATSIONALIZATORSKIYE PREDLOZHENIYA I IZOBRAZHENIYA in Russian No 2, 1986 (manuscript received 12 Feb 86) p 7

[Article by G.A. Derbentseva, All-Union Scientific Research Institute of Biological Equipment Construction]

[Abstract] This [jet-injection] unit developed by Yu.I. Pozhidayevyy and Yu.I. Koshkin is designed for mass treatment of animals with aerosols containing medications. It can be used for animal vaccination, immunization and inhalation therapy. It resembles a gun with an attachment for medication and compressed inert gas. Once its cylinder is filled with a precise dose of the drug, a plunger releases compressed gas and creates desired aerosol. Figures 1.

7813/13046  
CSO: 1840/1041

UDC 616-001.4-002.3-02:616-001.17-089:615.35

#### TREATMENT OF GRANULATING BURNS WITH EPSILON-AMINOCAPROIC ACID

Leningrad VESTNIK KHIRURGII IMENI I.I. GREKOVA in Russian Vol 137, No 10, Oct 86 (manuscript received 6 Mar 86) pp 65-67

[Article by A.P. Levitskiy and V.I. Zheleznyy, professors, P.G. Litvinov, candidate of medical sciences, and Yu.G. Kadyshev, No 2 Chair of Surgical Diseases, Therapeutics Faculty, Odessa Medical Institute imeni N.I. Pirogov]

[Abstract] Therapeutic trials were conducted with the use of epsilon-aminocaproic acid (EACA) in the various stages of burns, employing a group of patients with burns approaching 20% of body surface. Application of 5% EACA solution after 14-15 days of conventional treatment accelerated epithelialization to 10.54%, vs. 4.59% for control patients in the same stage

on furacilin. Studies on additional patients demonstrated that EACA, in combination with tetraolean [sic], facilitated survival of skin autografts. These observations suggest that 5% EACA solutions should be a valuable adjunct in the management of various stages of burn lesions. References 2 (Russian).

12172/13046  
CSO: 1840/313

UDC 579.083.131:621.0398

ADHESION OF ASPERGILLUS NIGER CONIDIA TO POLYMERIC SURFACES

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 291, No 5, Dec 86 (manuscript received 16 May 86) pp 1241-1244

[Article by I.V. Kaznacheyev, K.Z. Gumargaliyeva and Yu.V. Moiseyev, Institute of Chemical Physics, USSR Academy of Sciences, Moscow]

[Abstract] In order to further define the mechanisms that may be involved in fouling and leading to biodegradation and deterioration of polymeric materials, a study was conducted on the adhesion of *Aspergillus niger* conidia to polymeric surfaces. Strength of adhesion was determined by centrifugation removal of the conidia from the polymer samples. The data demonstrated that adhesion over a temperature range of 22 to 38°C and 0 to 100% relative humidity followed an exponential curve with a positive slope. In terms of the degree of adhesion, the polymers were ranked as follows: polyethylene terephthalate = acetyl cellulose > cellophane > polymethylmethacrylate > epoxy resin > polyethylene. With increasing temperatures the degree of adhesion and the rate of adhesion diminished, with the maximum strength of adhesion seen with a relative humidity of 100%. These findings demonstrated that adhesion involved both molecular forces and capillary factors. Figures 3; references 2 (Russian).

12172/13046

CSO: 1840/345

UDC 663.033:57.083.13(088.8)(47+57)

APPARATUS FOR MICROORGANISM CULTIVATION WITH RECYCLED AIR SUPPLY

Moscow RATSIONALIZATORSKIYE PREDLOZHENIYA I IZOBRETENIYA in Russian No 2, 1986 (manuscript received 12 Feb 86) pp 2-3

[Article by V.A. Fedotov, All-Union Scientific Research Institute of Biochemical Machinery Projects]

[Abstract] At present, filtered air is supplied from the outside for cultivation of aerobic microorganisms. The title apparatus is described as employing an internal recycled air supply. Having passed through the culture medium, the air is directed into a porous element aerated with outside air.

Passing through this element, the spent air is recharged with atmospheric air without leaving the system. The pores are 0.1 to 0.4  $\mu\text{m}$  in diameter, assuring aseptic conditions for the culture. The porous walls are made of "nuclear filters" assuring high rate of diffusive gas exchange. Figures 1.

7813/13046

CSO: 1840/1041

GUNSHOT WOUNDS OF LARGE BLOOD VESSELS

Kiev KLINICHESKAYA KHIRURGIYA in Russian No 10, Oct 86 (manuscript received 25 Feb 86) pp 53-57

[Article by V.A. Babosha, Yu.B. Zhukov, R.I. Karikh and A.V. Borzykh, Donetsk Scientific Research Institute of Traumatology and Orthopedics, Ukrainian SSR Ministry of Health; Donetsk State Medical Institute imeni M. Gorky]

[Abstract] A brief review is presented of the history of management of gunshot wounds of the large arteries and veins, with the notation that such lesions are becoming more complicated and difficult to manage in view of the development of more damaging missiles and bullets. To date, venous grafts appear to be the most promising approach to repair arterial wounds, while synthetic materials have either received negative or guarded evaluations. The conclusion, however, is clear: Treatment and restoration procedures available to surgeons for managing such lesions have not kept pace with the ability to cause such injuries. References 69: 34 Russian, 35 Western.

12172/13046  
CSO: 1840/314

UDC 547.963.32.07

PLASMID VECTOR FOR GENE EXPRESSION CONTAINING TEMPERATURE-REGULATED PROMOTER  
FOR PHAGE LAMBDA P'<sub>R</sub> DNA

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 291, No 5, Dec 86  
(manuscript received 22 May 86) pp 1253-1256

[Article by V.V. Kravchenko and L.A. Petrenko, All-Union Scientific Research  
Institute of Molecular Biology, Koltsovo, Novosibirsk Oblast]

[Abstract] A plasmid vector was designed for gene expression at elevated temperatures in *E. coli* systems. The vector was constructed by using a DNA fragment of phage lambda containing late transcription promoter P'<sub>R</sub> and gene Q, which was cloned in plasmid pQP'<sub>R</sub>. Determinations of beta-galactosidase activity in transformed *E. coli* (lac(-)Z) at 30, 37 and 42°C revealed that at 30°C the expression vector was inoperative. At 42°C beta-galactosidase activity showed marked elevation in the first 2 h following induction, followed by a decline in activity. At 37°C, beta-galactosidase activity remained uniformly high. The activity of the promoter was seen to be induced by the antiterminator protein Q, the synthesis of which is controlled by the temperature-sensitive repressor cI and promoter P<sub>R</sub>. The inclusion of a double control for promoter P'<sub>R</sub> in the vector facilitates expression of the cloned gene at the temperature optimal for *E. coli*, i.e., 37°C. Figures 2; references 10: 2 Russian, 8 Western.

12172/13046  
CSO: 1840/330

UDC 578.2

COMPARATIVE STUDY ON POTEXVIRUS GENOMES: PRIMARY STRUCTURE HOMOLOGY OF CAPSID  
PROTEINS OF POTATO MOSAIC AUKUBAVIRUS AND POTATO X VIRUS

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 290, No 3, Sep 86  
(manuscript received 18 Apr 86) pp 728-732

[Article by V.S. Bundin, O.A. Vishnyakova, V.M. Zakharyev, S.Yu. Morozov,  
I.G. Atabekova and K.G. Skryabin, Institute of Molecular Biology, USSR Academy  
of Sciences, Moscow; Moscow University imeni M.V. Lomonosov]

[Abstract] A comparison was conducted on the 3'-end of the genome RNA of  
potato mosaic aukubavirus (PMAV) and potato X virus (PXV) and on the capsid

proteins to determine the degree of homology between these two members of the potexvirus. Comparison of the nucleotide sequences of PMAV and PXV revealed considerable homology, confirmed by amino acid sequencing of the capsids. This study also demonstrated that the gene for the capsid protein is located at the 3'-end of the genomic RNA. The central regions of the capsid proteins of PXV and PMAV possess common general features and, in view of their conservative nature, appear to be related to the structural organization of the respective virions. Figures 3; references 14: 4 Russian, 10 Western.

12172/13046  
CSO: 1840/344

UDC 577.21.6.3.1

#### RELATIVE EFFICIENCIES OF SEVERAL ESCHERICHIA COLI AND PHAGE LAMBDA PROMOTERS

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 291, No 6, Dec 86  
(manuscript received 20 Jun 86) pp 1510-1513

[Article by S.V. Mashko, R.L. Gorovits, M.E. Trukhan, Ye.Ya. Demchuk, M.I. Lebedeva, A.L. Lapidus, S.M. Podkovyrov, Yu.I. Kozlov and V.G. Debabov, All-Union Scientific research Institute of Genetics and Breeding of Industrial Microorganisms, Moscow]

[Abstract] Studies were conducted on assessing the relative efficiency of several *E. coli* promoters (lacUV50P, trpOP, catOP) and lambda phage promoters ( $P_R$ ,  $P_L$ ), in a method relying on the measurement of the rate of initiation of transcription of the corresponding mRNA. The latter was analyzed via hybridization of pulse-labeled mRNA with a complementary region of the structural gene. A collection of recombinant plasmids was created in which the structural gene chloramphenicol acetyltransferase (CAT) was transcribed by means of these promoters. The presence of gene bla( $Ap^r$ ) in the recombinant molecules with its own promoter made it possible to use that mRNA in the cell as an internal standard against which the absolute concentration of the CAT gene mRNA, synthesized with the promoters being tested, could be based. The promoters were ranked on a relative efficiency scale on the basis of recognition by *E. coli* RNA polymerase. The data showed that using the  $R_R$  promoter in place of lacUV50P or trpOP would increase the expression of a foreign gene 5- or 2- to 3-fold, respectively. Figures 2; references 11: 2 Russian, 9 Western.

12172/13046  
CSO: 1840/347

# PREPARATION OF DNA PROBE WHICH REVEALS DNA SEQUENCES WHICH ARE AMPLIFIED IN COLCHICINE RESISTANT CELLS

Moscow MOLEKULYARNAYA BIOLOGIYA in Russian Vol 20, No 1, Jan-Feb 86  
(manuscript received 2 Jan 85) pp 146-153

[Article by A.V. Gudkov, O.B. Chernova, Ye.Ye. Siyanova, I.I. Sokova and B.P. Kopnin, Scientific Research Institute of Carcinogenesis, All-Union Scientific Oncological Center, USSR Academy of Medical Sciences, Moscow]

[Abstract] Development of a DNA probe, specific for sequences amplified in Djungarian hamster cells, highly resistant to colchicine and other cytostatic agents, is described and discussed. The probe was produced by enriching the fraction of middle-repeating DNA sequences of resistant cells and concurrent hybridization of the DNA. The probe revealed amplified sequences in resistant cell lines in experiments employing concurrent hybridization in the presence of an excess of unlabeled DNA from wild-type cells. Comparison of DNA's from Djungarian hamster cells sublines, resistant to colchicine, adriablastin and actinomycin D, showed that similar but not identical restrictase fragments of the genome section are amplified in all cases. Hybridization in situ with  $[^3\text{H}]\text{DNA}_{\text{cot}} = 10\text{-}250$  showed that amplified sequences are located in the long homogenously-staining regions of the marker chromosomes. The DNA fraction obtained may be used to clone genes amplified in cells which are resistant to colchicine, adriablastin and actinomycin D. The probe may be used to study transcription and to select amplified sequences from gene libraries of cells resistant to colchicine. The method used in this study may be applied to other systems in which amplification of genome systems is observed. Figures 3; references 35: 9 Russian, 26 Western.

2791/13046  
CSO: 1840/215

# RESTRICTASE ANALYSIS OF DNA OF PHAGE SM PSEUDOMONAS AERUGINOSA

Moscow MOLEKULYARNAYA BIOLOGIYA in Russian Vol 20, No 1, Jan-Feb 86  
(manuscript received 21 Jan 85) pp 181-184

[Article by A.M. Kulba, A.S. Gorelyshev and Yu.K. Fomichev, Minsk Support Unit, All-Union Scientific Research Institute of Genetics and Selection of Industrial Microorganisms]

[Abstract] Results of physical mapping of the genome of a new moderate phage, SM P aeruginosa, which resembles phage  $\lambda$  in some biological properties, are described and discussed. DNA of phage SM Pseudomonas aeruginosa has one PvuII site, two BamHI sites, three Hind III sites and five EcoRI sites. DNA of

phage SM *P. aeruginosa* has, in its structure, cohesive ends, similar to cos-sites of phage  $\lambda$  DNA. The mean molecular mass of DNA of phage Sm is 26.5 MDa. Phage Sm is the first known phage of *P. aeruginosa* whose DNA has cos segments, which may provide the basis for developing a gene cloning system in the *Pseudomonas* system. Figures 3; references 11: 4 Russian, 7 Western.

2791/13046  
CSO: 1840/215

UDC 577.213

#### REPLICATION IN YEASTS OF PLASMID pE194 FROM STAPHYLOCOCCUS AUREUS

Moscow MOLEKULYARNAYA BIOLOGIYA in Russian Vol 20, No 1, Jan-Feb 86  
(manuscript received 18 Mar 85) pp 219-223

[Article by A.L. Polumiyenko and S.P. Grigoryeva, All-Union Scientific Research Institute of Protein Biosynthesis, Moscow]

[Abstract] Data concerning the capacity of the plasmid pE194, from *S. aureus*, to be replicated in yeasts are presented and discussed. It was found that plasmid pE194 may be an autonomously-replicating sequence in yeasts (*saccharomyces*). The hybrid plasmid pLD744 containing pE194 and yeast LEU2 gene sequences is unstable in yeast, like other YRp-vectors. The mitotic stability of plasmid pLD744 was 1 percent, on the average. Plasmid pLD712, which differs from plasmid pLD744 by the presence of a centromeric sequence from chromosome III of yeast *Saccharomyces cerevisiae* has about one order of magnitude greater stability. The presence in the primary structure of pE194 of sequences which conform closely to that of a "common" yeast replicator justified the assumption that their presence is not sufficient for effective functioning of this plasmid as an autonomously-replicating sequence in yeast. Figures 1; references 24: 1 Russian, 23 Western.

2791/13046  
CSO: 1840/215

UDC 577.216.9:578.52

#### CLONING TRANSGENIC MOUSE DNA FRAGMENT CONTAINING INTEGRATED RECOMBINANT PLASMID

Moscow MOLEKULYARNAYA BIOLOGIYA in Russian Vol 20, No 1, Jan-Feb 86  
(manuscript received 13 Feb 85) pp 278-287

[Article by V.Z. Tarantul, V.V. Kucheryavyy, I.V. Makarova, Yu.N. Baranov, T.V. Begetova, L.Ye. Andreyeva, M.B. Smirnova and K.G. Gazaryan, Institute of Molecular Genetics, USSR Academy of Sciences, Moscow, Moscow University imeni M.V. Lomonosov]

[Abstract] The recombinant DNA fragment (pMA3), containing exogenous and related DNA sequences "rescued" from the genome of transgenic mice is

described and discussed. The study used C57/BL6 mice. Lines of mice containing plasmid pMA3 sequences in their DNA were obtained by micro-injection of this plasmid into the zygote. The "rescued" plasmid (pMAR1) contained none of the virus sequences found in plasmid pMA3 and retained only segment of plasmid pBR322 responsible for plasmid replication and resistance of E. coli cells to ampicillin. Plasmid pMA3 depletion occurred upon its integration into the mouse genome after micro-injection into the zygote. The integrated segment of the plasma adjoins the genome repeated sequence which is highly conservative in evolution. Figures 5; references 38: 5 Russian, 33 Western.

2791/13046

CSO: 1840/215

## NON-IRRADIATING ELECTROMAGNETIC RADIATION

UDC 538.56;591.48

### EFFECTS OF UHF FIELDS ON GABAERGIC AND CHOLINERGIC NEUROTRANSMITTERS

Moscow RADIOBIOLOGIYA in Russian Vol 25, No 3, May-Jun 85 (manuscript received 11 Mar 84) pp 426-428

[Article by I.G. Akoyev, M.V. Karanova, V.I. Kuznetsov and O.V. Kolomytkin, Institute of Biological Physics, USSR Academy of Sciences, Pushchino]

[Abstract] A study was conducted to define the relationship between the inhibitory GABAergic and the excitatory cholinergic neurotransmitter systems in the neocortex of male Wistar rats (150-200 g) subjected to UHF fields. The resultant data demonstrated that exposure of the animals to the UHF (1-3 mW/cm<sup>2</sup>, 880 MHz, 16 Hz modulation) fields for 1 h diminished the binding of the GABA agonist muscimol to synaptic GABA receptors. In addition, such exposure depressed the activities of acetylcholinesterase, leading to elevated levels of acetylcholine. The net effect of UHF irradiation was, therefore, to increase the level of neocortical excitability. Figures 2; references 10: 2 Russian, 8 Western.

12172/13046  
CSO: 1840/249

UDC 577.391;576.8

### EFFECTS OF ELECTROMAGNETIC FIELD ON V. HARVEYI BIOLUMINESCENCE

Moscow RADIOBIOLOGIYA in Russian Vol 25, No 3, May-Jun 85 (manuscript received 3 Sep 84) pp 362-366

[Article by G.B. Bochkova, S.V. Yermolin and B.S. Rodich, Institute of Biophysics, USSR Ministry of Health, Moscow]

[Abstract] Agar cultures of *V. harveyi* 392 were grown in cuvettes in order to measure the effects of an electromagnetic field superhigh frequency radiation on bioluminescence. The resultant changes in bioluminescence were found to be temperature-dependent, showing an irreversible decline in intensity at 35°C. At 25°C and 30°C exposure of the cultures to the radiation (7.00 GHz, 4-20 mW/cm<sup>2</sup>) resulted in a dose-related 8- to 10-fold increase in the intensity of luminescence. After 30-40 min at the lower

temperature the intensity began to diminish to baseline levels. These observations demonstrated that studies on the bioluminescence of *V. harveyi* are best conducted at 25-30°C with intensities of 10 mW/cm<sup>2</sup> exposures. At higher temperatures denaturation of luciferase precludes acquisition of reliable data. Figures 4; references 8: 6 Russian, 2 Western.

12172/13046

CSO: 1840/249

INFLUENCE OF CENTRAL CHOLINOLYTICS ON OPIOID NEUROPEPTIDE CONTENTS IN  
ANIMAL BRAIN

Kiev UKRAINSKIY BIOKHMICHESKIY ZHURNAL in Russian Vol 58, No 6, Nov-Dec 86  
(manuscript received 10 Apr 86) pp 61-63

[Article by L.A. Gromov and V.A. Zhila, Scientific Research Institute of Pharmacology and Toxicology, Ministry of Health, Ukrainian SSR, Kiev: "The Influence of Central Cholinolytics on Opioid Neuropeptide Contents in Animal Brain"; submitted for publication 10 Apr 1986; the first paragraph is the original English summary]

[Text] Atropine, amizil and glypin are shown to decrease the level of methionine- and leucine-enkephalins in the rat brain. The effect depends on the dose of cholinolytics.

It is generally recognized that the primary pharmacologic reaction of central cholinolytics (atropine, amizil and glypin) is associated with blockage of M-choline receptors. The diversity of pharmacologic effects (and, in particular, tranquilizing, analgesic and other effects) of this group of substances does not lend itself to an easy explanation along these lines alone.

For this reason studies have been made of the effect of central cholinolytics on the exchange of mediators (acetylcholine, noradrenaline and serotonin) [1-4], phospholipids [5] and protein synthesis [6] in various departments of the brain; these studies, however, did not yield a complete explanation of the mechanism of action of these substances. Recently, participation of the opiate system in regulation of psychophysiological functions as well as pain responses has been broadly discussed.

It has been suggested [7] that tropine derivatives could interact with opiate receptors.

We earlier demonstrated a modulating influence of opioid neuropeptides on cholinergic transfer [8-10]. It seemed of interest, therefore, to study the effects of atropine, amizil and glypin on the contents of opioid neuropeptides in animal brain.

## Materials and Methods

Experiments were done on 67 mongrel albino rats with a weight of 170-200 g. Atropine and amizil were administered intraabdominally in doses of 20 and 40 mg/kg and glypin 20 mg/kg. The animals were decapitated 1 hr after the injections.

The contents of opioid neuropeptides (methionine- and leucineencephalin) were determined radioimmunologically using radioimmuno assay sets fabricated by INC (United States). Neuropeptides from brain homogenate (excluding cerebellum) were isolated as described in a previous publication [11].

## Results and Discussion

It was established that atropine, amizil and glypin reduce the methionine- and leucineencephalin contents in animal brain (see table 1).

Table 1. Atropine, Amizil and Glypin Effects on Methionine- and Leucineencephalin Content in Animal Brain (nM/kg;  $M \pm m$ ;  $n = 5-11$ ,  $p < 0.05$ )

| Neuro-peptide         | Control          | Atropine         |                  | Amizil           |                  | Glypin,<br>20 mg/kg |
|-----------------------|------------------|------------------|------------------|------------------|------------------|---------------------|
|                       |                  | 20 mg/kg         | 40 mg/kg         | 20 mg/kg         | 40 mg/kg         |                     |
| Methionine-encephalin | 402.6 $\pm$ 28.6 | 271.3 $\pm$ 28.7 | 258.7 $\pm$ 32.6 | 259.0 $\pm$ 33.9 | 216.4 $\pm$ 16.1 | 236.3 $\pm$ 36.4    |
| Change, %             |                  | -32.6            | -35.8            | -35.7            | -46.3            | -41.3               |
| Leucine-encephalin    | 42.0 $\pm$ 1.4   | 28.2 $\pm$ 2.6   | 21.8 $\pm$ 1.4   | 16.5 $\pm$ 2.6   | 29.7 $\pm$ 2.0   | 17.0 $\pm$ 1.9      |
| Change, %             |                  | -33.5            | -48.6            | -61.0            | -29.9            | -59.9               |

Noteworthy, a distinct tendency was observed in a pronounced drop of methionine- and leucineencephalin content, depending on the strength of cholinolytic action of the substances being studied. It has been established that these substances form the following series in cholinolytic activity: atropine < amizil < glypin. When injected in a dose of 20 mg/kg the substances depressed the neuropeptide level in the same sequence of magnitude. When the atropine dose was raised from 20 to 40 mg/kg the degree of suppression of methionine- and leucineencephalins content in the brain was increased. The same was observed with methionineencephalin when the dose of amizil was raised from 20 to 40 mg/kg.

Central cholinolytics, therefore, reduce methionine- and leucineencephalin contents in animal brain, and the effect is dose-related.

We earlier discovered [2] that amizil also reduces brain content of  $\beta$ -endorphins.

According to the theory suggested by Zakusov [7], tropine derivatives interact with opiate receptors. This could probably lead to an ouster of opioid neuropeptides from the binding sites. The high activity of aminopeptidases results in their intensive splitting, which eventually reduces their content in the brain homogenate.

The drop in neuropeptide level in the brain under the effect of cholinolytics can be due to various causes: an intensified release from the depot, increased molecular degradation caused by heightened encephalinase activity, reduced rate of their biological synthesis and disrupted interaction with opiate receptors.

The last fact has a theoretical explanation in that increased concentration of sodium ions reduces the rate of receptor binding of opiate ligands [13]. At the same time, the blockage of choline receptors by cholinolytics stops the sodium ion flow into the cell [8]. The resulting increase in extracellular sodium ion concentration could interfere with the binding of opioid neuropeptides to opiate receptors.

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CSO: 1840/323

THERAPEUTIC IMMOBILIZED-ENZYME PREPARATIONS WITH ENHANCED TARGET AFFINITY

Moscow ANTIBIOTIKI I MEDITSINSKAYA BIOTEKHNOLOGIYA in Russian Vol 31, No 2,  
Feb 86 pp 122-127

[Article by V.P. Torchilin, A.V. Maksimenko, Ye.G. Tishchenko, M.I. Papisov  
and V.N. Smirnov, Institute of Experimental Cardiology, All-Union  
Cardiological Scientific Center, USSR Academy of Medical Sciences, Moscow]

[Abstract] A summary presentation is made of some of the recent advances in targeting therapeutic agents to the site of action. Considerable experimental work with the use of urokinase for the dissolution of thrombi has shown that preparations in which the enzyme is covalently linked to fibrinogen have enhanced thrombolytic activity. This is based on the fact that fibrinogen has a natural affinity for thrombi and carries the urokinase to the site of thrombosis. In addition, the structural modification in urokinase induced by linking to its protein carrier enhances its fibrinolytic activity 2.5-fold in comparison with free urokinase. A somewhat different approach in thrombolysis was equally successful: chymotrypsin was covalently linked to antifibrin antibody, and as a result delivered to the site of thrombosis. More recent studies have shown that magnetized Sephadex particles--which may serve as vehicles for enzymes or other agents--can be directed by externally-applied magnetic forces to a desired anatomic location. This review covered but a few examples, but even these are indicative of the potential for specific drug delivery to desired targets. Figures 7; references 19: 6 Russian, 13 Western.

12172/13046

CSO: 1840/330

QUALITATIVE AND QUANTITATIVE SPECTROPHOTOMETRIC DETERMINATION OF  
CHOLINOLYTICS AND ANTICHOLINESTERASE DRUGS BASED ON REACTION WITH  
DINITROBINDONE

Kiev FARMATSEVITYCHNYY ZHURNAL in Ukrainian No 3, May-Jun 85 (manuscript  
received 10 Apr 84) pp 40-42

[Article by B.P. Zorya, V.V. Petrenko, S.G. Solomonova and N.G. Fedina,  
Zaporozhye Medical Institute]

[Abstract] A spectrophotometric method has been developed for the analysis  
of atropine sulfate, platyphylline hydrotartrate, and physostigmine  
salicylate, based on the formation of complexes between these agents and a  
0.5% dinitrobindone solution in dioxane and readings taken at 483, 488 and  
490 nm, respectively. The method may be used for monitoring the concentra-  
tions of these agents in solutions intended for injection. The method has  
been found to be highly sensitive with detection levels of 3.6-4.03  $\mu\text{g/ml}$ ,  
and accurate to within  $\pm 0.54\%$ . References 7: 1 Ukrainian, 6 Russian.

12172/13046

CSO: 1840/328

UDC 615.31.1:546.13

SPECTROPHOTOMETRIC ANALYSIS OF UNITHIOL

Kiev FARMATSEVITYCHNYY ZHURNAL in Ukrainian No 3, May-Jun 85 (manuscript  
received 15 May 84) pp 42-45

[Article by B.A. Chakchir and V.V. Trokhimchuk, Military Medical Academy  
imeni S.M. Kirov]

[Abstract] A spectrophotometric method has been developed for the analysis  
of unithiol (2,3-dimercapto-1-propanesulfonic acid) in medicinal form, one  
of the most effective antidotes to heavy metal poisoning. The analytical  
approach is based on the reaction of unithiol with 5,5'-dithio-bis-  
(2-nitrobenzoic acid) in phosphate buffer, pH 8.0, leading to the formation of  
a yellow complex. Read at 412 nm, the lower limit of unithiol detection was  
established at 0.307  $\mu\text{g/ml}$ , with an accuracy of 1.20-2.03%. References 9:  
2 Ukrainian, 4 Russian, 3 Western.

12172/13046

CSO: 1840/328

## PHARMACOKINETIC RESEARCH IN USSR

Moscow PRAVDA in Russian 22 Dec 87 p 7

[Article by O. Frantsen]

[Abstract] Pharmacokinetic studies in the USSR are perceived to lag far behind other countries, leading to inefficient use of drugs and diminishing their clinical value. Even in basic drug research the pharmacokinetic side is often neglected, with the drugs provided in inadequate dosage forms or vehicles. It is felt that the time has come to overcome this inertia and catch up with other countries, and to give due recognition to the few brave souls working in this area instead of accusing them of wasting their time. To a limited extent, pharmacokinetics are appreciated at some research and clinically-oriented institutes, but the overall pattern remains one of neglect of this basic subspecialty of pharmacology. There is a need to establish a scientific research institute devoted solely to pharmacokinetics.

12172/13046

CSO; 1840/268

## PHYSIOLOGY

### FIFTIETH ANNIVERSARY OF GSSR INSTITUTE OF PHYSIOLOGY

Tbilisi ZARYA VOSTOKA in Russian 3 Oct 86 pp 1, 3

[Article by Georgian Information Service]

[Abstract] The title institute, initiated by I.S. Beritashvili, grew into one of the largest scientific centers of the country during the last 50 years; it is devoted to study of fundamental problems of neurobiology. A special session attended by many renowned scientists was held to celebrate its 50th anniversary. Principal addresses were given by Deputy Chairman of the Soviet Ministers, GrSSR, Z.A. Chkheidze and Director of the Institute, member of the USSR Academy of Medical Sciences, M.M. Khananashvili who noted achievements of the Institute and its individual scientists; many of these contributions have been recognized by foreign Academies of Sciences. A new 14-floor building devoted to laboratory research was opened at this occasion.

7813/13046

CSO: 1840/1024

UDC 612.821

### EFFECT OF HIGH SPATIAL FREQUENCIES ON VISUAL RECOGNITION PROCESSES

Leningrad FIZIOLOGICHESKIY ZHURNAL SSSR IMENI I.M. SECHENOVA in Russian Vol 71, No 9, Sep 85 (manuscript received 22 Sep 83) pp 1067-1071

[Article by Ye.D. Borisova and O.P. Tairov, Physiology of Labor Laboratory, Department of Physiology of Higher Nervous Activity (head of department A.S. Batuyev), Leningrad State University imeni A.A. Zhdanov]

[Abstract] An experiment involving 8 healthy persons with normal vision, ranging in age from 19-28 years, tested the capacity to recognize circular form (0,2,3,5,6,8,9) Arabic numbers presented rapidly on a white screen (exposure time from 20-100 ms) with room illumination at 12 lux and screen illumination at 23 lux. Latent periods of responses, correct responses and evoked potentials of optic regions of the cortex in zones  $O_1$  and  $O_2$  were registered. Blurring the images reduced the probability of recognition and reduced the amplitude of late phases of the visually-evoked potentials  $N_1$  and

P<sub>2</sub>. Increase of the maximum spatial frequency of the image increased the peak latent periods of wave N<sub>1</sub> and decreased the positive wave P<sub>2</sub>. The N<sub>1</sub> wave reflected activation of selectively-set spatial-frequency filters of the visual sensory system and the P<sub>2</sub> wave value reflected processes of decision making and depended upon the number of analyzed signs of the images. The electrophysiological indicators of the process of visual recognition of the images, filtered to different degree, indicated that analysis by the visual system of the high-frequency part of the spectrum of images in its significant range facilitated the decision-making process by increasing signs of recognition. Figures 3; references 17: 10 Russian, 7 Western.

2791/13046  
CSO: 1840/229

UDC 612.54+612.216.3

#### NEUROCHEMICAL MECHANISMS OF ARTIFICIAL HYPOBIOSIS AND OF CHEMICAL THERMOREGULATION

Leningrad FIZIOLOGICHESKIY ZHURNAL SSSR IMENI I.M. SECHENOVA in Russian Vol 71, No 9, Sep 85 (manuscript received 20 Jul 84) pp 1145-1150

[Article by N.N. Timofeyev and G.A. Konstantinov, Physiology of Hypobiosis Laboratory (head N.N. Timofeyev), Institute of Pharmacology, USSR Academy of Medical Sciences, Moscow]

[Abstract] Development of an experimental model of artificial hypobiosis, based on the same principle of cutoff of processes of chemical thermoregulation that occurs in natural hypobiosis, involved studies on 60 rats and 40 rabbits. Ornid was injected intraperitoneally only or partially (10-20 percent of the dose) intravenously. Ornid dosage was determined by use of 10, 20, 30, 50 mg/kg doses and selecting the minimum dose which cut off chemical thermoregulation. Injection of ornid (30 mg/kg for rats and 50 mg/kg for rabbits) reduced oxygen demand by 20-30 percent within 1-2 hours with preservation of normal body temperature. Reduction of body temperature produced further reduction of metabolism with the degree decreasing most abruptly at stages at which cold narcosis occurs. The metabolism level could be reduced to one-tenth of the standard level and maintained at this level for 5-6 days while maintaining the possibility of reversal. The studies showed the key role of adrenergic influences in the shut down of chemical thermoregulation and development of artificial hypobiosis. The process used in this study made it possible to cut off chemical thermoregulation processes, to transfer a warm-blooded animal into the state of poikilothermy and to greatly reduce the level of metabolic processes. These findings justified consideration of the use of the ornid model in practical medicine. Figures 2; references 15: 12 Russian, 3 Western.

2791/13046  
CSO: 1840/229

## POSTSYNAPTIC EFFECTS OF CHOLINESTERASE INHIBITORS IN SYMPATHETIC GANGLIA OF FROG

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 291, No 5, Dec 86  
(manuscript received 2 Apr 86) pp 1260-1263

[Article by V.Yu. Bolshakov, N.Ya. Lukomskaya and L.G. Magazanik, Institute of Evolutionary Physiology and Biochemistry imeni I.M. Sechenov, USSR Academy of Sciences, Moscow]

[Abstract] A study was designed to evaluate the mechanisms of postsynaptic effect of AChE inhibition and the involvement of muscarinic receptors. The test system, consisting of electrophysiological studies on the sympathetic ganglia of *Rana temporaria* demonstrated that all factors that promote an increase in the acetylcholine levels in the synaptic cleft (increasing frequency of nerve stimulation, addition of 4-amino-pyridine) lead to further inhibition of AChE (depression of membrane potential, altered action potential generation). However, activation of presynaptic muscarinic receptors by the accumulated acetylcholine diminished the quantum content of excitatory postsynaptic potentials. The latter effect led to a decrease in the acetylcholine levels in the synaptic clefts and diminished depolarization. It appears, therefore, that perturbations in synaptic neurotransmission resulting from inhibition of AChE are due largely to the accumulation of acetylcholine and its effects on postsynaptic acetylcholine receptors, primarily the muscarinic type. However, activation of the presynaptic muscarinic receptors would be expected to weaken the postsynaptic changes. Figures 3; references 13: 2 Russian, 11 Western.

12172/13046  
CSO: 1840/345

UDC 612.015.33:612.017.2:612.391

## EFFECTS OF EXTREME STRESS FACTORS ON INTENSITY OF CEREBRAL AND HEPATIC AUTOLYSIS IN RATS

Moscow BIOLOGICHESKIYE NAUKI in Russian No 10, Oct 86 (manuscript received 6 Mar 85) pp 42-45

[Article by L.V. Mogilnitskaya and I.V. Shepotinovskaya, Scientific Research Biological Institute, Rostov State University]

[Abstract] Outbred male rats (150-180 g) were employed in a study on the effects of extreme factors on the intensity of protein catabolism in the brain and in the liver. Exposure of the animals to cold (2-4°C) for 3 h increased hepatic proteolysis by 21% ( $P < 0.05$ ), while the same process in the brain was not affected. A similar pattern was obtained with starvation for 7 days: Proteolysis in the liver increased and in the brain remained

unaffected. Folin tests for tyrosinase demonstrated that cold exposure resulted in a 51% reduction in the liver levels, and by 27% in the brain, whereas starvation failed to affect tyrosine level in the liver while leading to a 69% increase in the brain. These findings confirm the fact that protein metabolism in the brain is subject to less alteration than in other tissues under the influence of extreme stress factors. Furthermore, it appears that low MW nitrogenous products of autolysis are transported to the brain from other tissues to maintain cerebral viability. References 14: 2 Ukrainian, 9 Russian, 3 Western.

12172/13046  
CSO: 1840/325

UDC 577.375.82:594.38

#### EFFECTS OF PHOSPHOLIPASE ON ELECTROEXCITABLE Ca CURRENTS IN NEURAL MEMBRANES

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 290, Sep 86 (manuscript received 24 Feb 86) pp 765-768

[Article by N.K. Chemeris, V.I. Ilyin, F.E. Filatov, A.R. Akopyan and A.A. Selishcheva, Institute of Biological Physics, USSR Academy of Sciences, Pushchino; Institute of Biochemistry, Armenian SSR Academy of Sciences, Yerevan; Moscow State University imeni M.V. Lomonosov]

[Abstract] An electrophysiological study was conducted with parietal and visceral ganglia of the large pond-snail to evaluate the effects of phospholipase on Ca currents, in order to assess the role of phosphoinositides in Ca transport. The study, involving both intracellular dialysis and voltage clamp techniques, demonstrated that *Bacillus cereus* phospholipase C specific for phosphoinositides led to inhibition of Ca currents on addition to the test system. However, exposure of the membrane to a nonspecific phospholipase had variable effects. These observations preclude an unequivocal determination of the mechanism of action of phospholipase C on Ca currents. The most important information that was derived dealt with the fact that phospholipases do exert an effect on the Ca channel. This implies that the function of the Ca channels involves activation of the phosphoinositol cycle, and that these channels may be subject to regulation by hormones or mediators that differ from cAMP-dependent mechanisms. Figures 2; references 15: 1 Russian, 14 Western.

12172/13046  
CSO: 1840/344

## PUBLIC HEALTH

### RESOURCES FOR PHARMACEUTICAL INDUSTRY

Moscow MEDITSINSKAYA GAZETA in Russian 12 Dec 86 pp 1-2

[Article by L.P. Telegin, First Deputy Minister of the Medical and Microbiology Industry: "On the Way to Acceleration"]

[Text] The 12th Five-Year Plan recently established by the Ministry of the Medical and Microbiology Industry has begun with a reorganization. The goal established for the industry at the 27th CPSU Congress calls for greater efficiency and a higher quality of medicinals and the expansion of their production to a level that will fully satisfy the needs of the health sector and provide the public with medicinal products of high quality.

The first step to resolving that task is to place the industry on a course of intensive development. The organization of the ministry's central apparatus has already been completed and industry leadership is being implemented by the functional principle and dual link system. Thirty-three production associations and nine scientific-production associations and four combines have been recently organized and enlarged.

Beginning with this year, the medical and microbiology industry will be operating under a large-scale economic experiment with new management conditions. The improvement in management, planning, and economic operations has made it possible to change matters for the better. Thus, higher economic incentives for the completion of medical product deliveries have made it possible to improve one of the industry's most important indices.

Thus, over an eleven-month period the plan for the delivery of medical products, including assignments and pledges, has been 99.3 percent completed. In comparison to the corresponding period of last year, short deliveries of products to the health sector have been cut by almost five times. The number of enterprises which have not fulfilled their contractual obligations has markedly decreased. This has been largely due to the widespread use of economic leverage and a higher degree of responsibility on the part of the enterprises. As a rule, a large volume of work is being performed by a smaller number of personnel because of newly introduced procedures for setting up the wage fund by stable norms, and expansion of enterprise potential.

Of course, not all the production associations are making full use of these innovations. Some supervisors have not yet taken that sharp turn toward better quality, efficiency, and new management methods. Fourteen enterprises have not fulfilled their assignments for greater productivity and a number of other indicators because of shortcomings in production organization. As before, the organizations that are lagging behind include the Ashkhabad Pharmaceutical Chemical Plant and the Tuymaz Medical Glassware Plant imeni 50th Anniversary of the USSR.

The 12th Five-Year Plan has been assigned a special role. The rate of socioeconomic development and the degree of the Soviet people's well-being will depend on the kind of foundation that is laid down now for the implementation of radical transformations in the national economy and the acceleration of scientific and technical progress.

This also fully applies to our industrial sector. The rate of production growth as a whole will be 168.1 percent of the 1985 growth rate level.

By 1990 we shall have to increase the production and supply of medicinals for the treatment of cardiovascular diseases, semi-synthetic antibiotics, and x-ray-contrast materials by 1.7 times. The production of products for treating oncological diseases, medical enzymes, antidiabetic and antiseptic agents will have to be increased by 1.5 times.

In connection with the fact that the ministry's potential has grown by the extensive introduction of new biotechnological achievements, fine chemical technology, and organic synthesis, plans are being made to master the production of over 100 new medicinal agents. Those products include 20 preparations for the treatment of cardiovascular diseases, 10 antitumor preparations, 15 preparations for the treatment of infectious and inflammatory diseases, plant-derived drugs, special pediatric medicinal forms, and polymer disposable products. Special emphasis should be given to the forthcoming preparations produced by genetic engineering, such as interferon, insulin, somatotropin, and plant tissue based medicines such as rauwolfine and ginseng.

Provisions are being made for the production of such preparations as adelfan, pulsnorma, furasemid, rumalon-aritron, and (cerebrolysine). Plans are being made to design and master the domestic technology required for the production of more than 20 analogs of highly effective foreign preparations in order to obviate the need to import such products from the capitalist countries.

The Ministry is taking measures for the maximum satisfaction of the customer's requirements. Thus the dosage of certain pediatric parenteral products is being reduced. The exterior appearance of products is being improved through the use of new film materials, laminated wrap, and colored print.

The quality of seals for flasks containing eye drops, brilliant green solution, iodine, and other medicinals is being improved. New types of packaging with dose dispensers have already been designed and will be put into production.

In proceeding toward the realization of the tasks set forth by the 27th CPSU Congress, we and our customer, the USSR Ministry of Health, have discussed pressing problems connected with the development and production of medicinal preparations, and we have outlined ways to accelerate the production of new items and expand the variety of products.

We have come upon a situation where the demand for the most important categories of preparations is significantly growing. According to estimates of the USSR Ministry of Health, that demand will double in the 12th Five-Year Plan, and by 1995 will increase by two and one-half times over the level of 1985.

In order to overcome the present discrepancy between the increasing demand for medicinals and the development of production capacity, the Ministry has prepared a detailed program which provides for a significant acceleration in the development of the industrial-production, scientific-technical, and experimental potential of the pharmaceutical chemical subsector in the 12th and 13th Five-Year Plan periods.

Plans are being made to build a number of new plants and pilot-production and experimental shops, and to expand and reconstruct presently operating enterprises as well as to organize 22 scientific-research and design bureau branches.

The scientific link is also being reorganized. The Ministry's collegium has approved a general plan for the organization of management of industrial science that extends to the plant sector inclusively, and has identified the priority areas.

The introduction of cost-accounting methods for mastering the production of products on the basis of supply-authorizations, the conversion to a system of payment for work that is fully completed and accepted by the buyer, and the reasonable use of other means of material and moral incentives will enable scientists to reorganize themselves so that their efforts will be reflected in specific and actually tangible products.

Many institutes have been incorporated into scientific-production associations and are working side by side with the central plant laboratories. That kind of cooperation between science and industry will significantly shorten the time required for the introduction of scientific-research projects.

Industrial sector scientific-technical units have been organized to resolve the most important and complex problems such as the manufacture of effective synthetic medicinals, vitamins, enzymes, and hormone preparations.

As is known, the 11th Five-Year Plan put its main emphasis on construction. The replacement of obsolete equipment and the capital replacement of operating enterprises took place at an extremely slow pace. That situation is radically changing in the 12th Five-Year Plan period. The proportion of capital investments allotted for plant retooling and reconstruction will grow from 629 million rubles to 1.3 billion rubles. This will create the required prerequisites for the intensification of manufacturing processes, higher production efficiency, and better utilization of plant capacity.

Today we cannot manage without a maximum utilization of our internal reserves. For example, plans are being made to double the volume of construction projects supported by local resources, and to treble the output of machine-building products at enterprises of our industrial sector. Intra-sector cooperation for the manufacture of spare parts for plant retooling will be expanded.

Plans are being made at the All-Union Scientific-Research Institute of Biotechnology and the association Progress to start the production of instruments, equipment, and automatic transfer machines for the manufacture and packaging of drugs.

Plans have been made to develop approximately 500 different kinds of instruments and devices, 80 transfer lines, automated machinery, and robots that are intended for mechanized in-line and automated production of tablets, parenteral products in vials, dressings and bandages, adhesive tape, and other medical products. This year there has already been an increase in the design of equipment for the manufacture of polymer packaging of eye drops and various parenteral and infusion solutions. Members of the CEMA nations are also involved in the resolution of these tasks.

However, there will not be forward progress in the situation unless there is a significant expansion of production capacity. The demand for equipment needed to manufacture prepared medicines is still only be satisfied at a 35 percent level.

There is an extreme shortage of machine-building products of high technical quality. Here we are counting on the specific help of the country's entire machine-building complex. Within the period of the 12th Five-Year Plan we hope to obtain machinery and instruments for biotechnology and pharmaceutical chemistry plants as well as modern rotary lines from the Ministry of Chemical and Petroleum Machine Building, the Ministry of Machine Building for Light and Food Industry and Household Appliances, and the Ministry of Instrument Making, Automation Equipment, and Control Systems.

The accelerated development of the pharmaceutical chemistry subsector requires a corresponding development of the materials and raw products base. Much is being planned in this area. However, there are a number of problems that still remain unresolved. For example, the USSR Ministry of the Chemical Industry has long delayed taking measures to expand the production of 2,6-phenylmethylpyrazolone, dimethylpyridine, ethyl cyanoacetate, and other intermediate products essential to the manufacture of Analgin, Parmidine, vitamin B<sub>6</sub>, and other preparations in short supply. The Ministry of Mineral Fertilizer Production has no plans in the current Five-Year Plan period for the production of paraphenylurethane sulfochloride and benzyl cyanide which are the basic raw ingredients for the synthesis of all the sulfanilamides and barbiturates. The USSR Ministry of the Petroleum Refining and Petrochemical Industry is neither satisfying current user requests nor does it have plans in the immediate future to satisfy such requests for methylethylpyridine, diethylketone, and other types of raw materials. There are as yet no plans for resolving many problems through the year 1990 that are concerned with the production and delivery of raw materials by enterprises of the USSR State Committee for the Agriculture Industry.

The shaping of plans for 1987 has now been completed. Many departments have turned around to recognize the requirements of the health sector. Our task is to see that this process accelerates irreversibly.

6289

CSO: 1840/343

## NEW DEVELOPMENT IN REMUNERATION OF PHYSICIANS

Moscow AGITATOR in Russian No 1, Jan 87 pp 27-29

[Article by G.M. Yakimovich, Division Director of Social-Cultural Branches of USSR State Committee of Labor and Social Problems]

[Abstract] Implementation of salary increases for medical personnel is underway. G.M. Yakimovich has attempted to answer some of the questions generated by this occurrence. On the average, the salaries will raise by 35.6%, of which 28-30% will be across the board raise, the rest in form of bonuses reflecting special qualifications, work load, state recognition, etc. Such bonuses had been payable before this increase, but at a much lower level. For the first time "board certification" will result in higher pay. Additional premiums based on annual review will be awarded in specially deserving cases. This pay change will be introduced gradually by specialty groups: first all pediatricians, then surgeons, anesthesiologists, orthopedic specialists, intensive care personnel, acute toxicity staff, obstetricians, and so on.

7813/13046

CSO: 1840/361

## POOR SELECTION OF MEDICAL STUDENTS AND POOR PHYSICIAN GRADUATES

Moscow IZVESTIYA in Russian 20 Jan 87 p 3

[Article by Yu. Shteyngardt, professor, Department Chairman at Tomsk University]

[Abstract] Only 20-25 percent of all medical students turn out to be highly professional, 50 percent are adequately so and 25-30 percent are actually poor physicians. The selection method used for admittance to medical colleges [institutes] has been blamed, suggesting that the criteria should be based strictly on entrance exams. There are few if any stimuli during the school years to strive for excellence and certainly the medical diploma is an overall equalizer. Repeated examination taking, availability of old exams, general trend towards conformity rather than excellence are factors leading to poor physicians. The practice of strict, multiple examinations should be

reinststituted and be the basis for graduation from medical colleges. The standards simply must be elevated.

7813/13046  
CSO: 1840/396

#### MEDICAL CADRES AND SALARIES

Moscow IZVESTIYA in Russian 22 Oct 86 p 3

[Article by L. Ivchenko]

[Abstract] The CC CPSU, USSR Council of Ministers and All-Union Central Council of Trade Unions have made the decision to increase the salaries of Public Health and Social Security workers. An interview is reported with G. Yakimovich, Director of the Division of Social-Cultural Branches of the USSR State Committee of Labor regarding new conditions for work remuneration. On the average, a pay increase of 35.6 percent is projected over time. First of all the salaries of surgeons, anesthesiologists, obstetricians and pediatricians along with their supportive staff will be increased, because it is difficult to staff these positions; especially, there is an acute shortage of nurses. Cities will be handled first, the rural areas will follow with pay raises in 1987. The pay will not be automatic and across the board; it will include considerations of responsibilities, qualifications, performance, etc. Premiums and salary supplements have been introduced. Some of the proposed salaries: practical nurses: 160-170 R; RN: 200 R; rural surgeons: 190 R. Additional pay will include bonuses for scientific degrees, national honors, board certifications, etc. The budget assigned for this 7 million body of workers is 3 billion 450 million rubles.

7813/13046  
CSO: 1840/1018

#### EMERGENCY MEDICAL SERVICE--SKORAYA POMOSHCH

Moscow VECHERNAYA MOSKVA in Russian 15 Jul 86 p 2

[Announcement]

[Abstract] Patient L. Volynkina expresses her gratitude--for the ambulance service she received in an emergency--to the source newspaper because she did not remember the names of the attending emergency team. The staff identified these individuals. Apparently many such letters are received directly at the first aid station and the work of this service has improved substantially in recent years. Its budget now is 30 million rubles, there are 46 substations and 768 emergency teams in operation. Total staff is in excess of 8,000. The Chief Physician has asked that a questionnaire be published by the

newspaper covering some aspects of this service so that if possible it could improve even more. Four questions were asked of the public: 1. Did the ambulance arrive quickly? 2. Was the medical service of high quality and did the team members interact properly with the patient, family and neighbors? 3. If hospitalization was required, was the reception satisfactory? and 4. What else can be done to improve this service?

7813/13046  
CSO: 1840/1020

#### HEALTH CARE FOR RURAL WORKERS

Tashkent SELSKOYE KHOZYAYSTVO UZBEKISTANA in Russian No 2, Feb 86 pp 52-54

[Article by S. Bakhramov, UzSSR Ministry of Health]

[Abstract] During the 11th Five-Year Plan the CC of UzCP improved material and technological resources for medical institutions in order to improve the health status of the population and especially that of the rural population. About 81.4 million rubles were allocated for construction of rural public health facilities, increasing hospital capacity by 9,925 beds and polyclinic volume by 10,150 visits per shift. Rural institutes were supplied with modern equipment, instrumentation and adequate medications. Rural medical staff was expanded; in the past 5 years it grew from 8,514 to 12,040 individuals, many of them highly qualified specialists. Preparing for population-based health screening, 700,000 individuals were examined to field-test the system. Municipal specialty hospitals accepted more rural inhabitants for treatment and consultation. During the past 5 years, 15 new children hospitals were opened bringing the total beds for pediatric care to 18,793. Special attention was given to obstetric units, intensive care for infants and pediatric nutrition programs. There are still shortcomings: inadequate space, inadequate ambulance service and nonpersonal treatment by attending medical staff. Preventive programs develop very slowly. Some corrective measures are listed as goals for the remainder of this century.

7813/13046  
CSO: 1840/1014

#### HOSPITAL RECEPTION SERVICE POOR

Kishinev SOVETSKAYA MOLDAVIYA in Russian 18 Oct 86 p ?

[Article by N. Dubina]

[Abstract] Procedures in two clinics are described; in Hospital #8, the patient lines were long and, apparently, little organized effort was evident to accommodate working patients. No differentiation was made between the

walk-ins, the follow-up patients, the really sick individuals and the routine examinations. Scheduling was inefficient. In contrast, at Hospital #6, there were no lines of waiting patients, proper scheduling of visits were made and adhered to and more physicians were available when required by the scheduling. Specialists were readily available for consultations. The difference between these two institutions lay in proper work organization and in devotion of the staff to their duties.

7813/13046  
CSO: 1840/1017

#### AMBULANCE SERVICE

Moscow VECHERNAYA MOSKVA in Russian 12 Aug 86 p 2

[Article by B. Yakovlev]

[Abstract] An account of several replies to a questionnaire on first aid service is given. The questionnaire surveyed the response time, quality of medical assistance, reception at the hospital and possible improvements. In the present note the replies were overwhelmingly positive. The only negative reply published concerned the fact that no all-night drugstore was open in the area, so that, after the visit by first aid team no drugs could be obtained until the next day. The report on this survey will continue.

7813/13046  
CSO: 1840/1021

#### PRIMARY CAUSES OF PEDIATRIC MORTALITY (14 YEAR AND YOUNGER) IN TAJIKISTAN

Dushanbe ZDRAVOOKHRANENIYE TADZHIKISTANA in Russian No 5, 1986 pp 76-86

[Article by Ya.T. Tadzhiyev, Z.I. Malikova, A.A. Khusainova and D.B. Sabirova, Chair of Social Hygiene and Organization of Public Health, Tajik State Medical Institute imeni Abuali ibn Sina]

[Abstract] A comparative evaluation was conducted in pediatric mortality figures for 1970 and 1980, covering 14 year olds and younger. In 1970 the leading causes of death were identified as disorders of the respiratory organs (47.23%), infectious and parasitic diseases (12.56%), and digestive disorders (9.39%). The corresponding figures in 1980 were 46.67, 23.79 and 10.34%. There were no statistically significant differences between boys and girls. However, the virtual doubling of the figure for infectious and parasitic diseases between 1970 and 1980 pointed to the inadequacy of public health and medical measures in the prevention and management of communicable diseases in Tajikistan. The figures also revealed that the 4 year olds and younger category sustained the highest increase in mortality in that time

span, with the figures for that group increasing from 14.2/1,000 in 1970 to 22.3/1,000 in 1980. These statistics indicate that serious and extensive efforts must be made by the health authorities in Tajikistan to improve the health status indicators, particularly as they apply to the pediatric population. References 6 (Russian).

12172/13046  
CSO: 1840/1006

#### COMPUTER DIAGNOSTIC CENTERS IN GEORGIAN SSR

Tbilisi ZARYA VOSTOKA in Russian 18 Dec 86 p 4

[Article by Mikhail Dzhindzhikhashvili]

[Abstract] Several years ago, scientists at the Georgian Oncological Center devised and constructed a computerized thermograph. The method of thermography has been very effective in the diagnosis of preclinical malignancies, and it appeared that there would be no problems in going into mass production. However, foot-dragging and administrative incompetence have been such that this apparatus is still absent from the medical diagnostic armamentarium. It now seems that the USSR Ministry of Health may be able to untie this Gordian knot and that, perhaps, production will finally start next year. Until then, many patients will continue to suffer needlessly.

12172/13046  
CSO: 1840/306

#### DEFECTIVE HEARING AIDS

Moscow IZVESTIYA in Russian 13 Jan 87 p 3

[Article by L. Zagalskiy]

[Abstract] After 6 years of trials and errors Soviet industry has been unable to produce a transistorized hearing aid that fits into an ear. It is precisely the insert portion that has become the stumbling block, and some that have been produced have been blue in color. One can only wonder that the advances of modern electronics would come to a dead halt because the technology isn't there to produce an insert that can be individualized.

12172/13046  
CSO: 1840/307

## TESTING OF NEW HEARING APPARATUS DELAYED

Moscow KOMSOMOLSKAYA PRAVDA in Russian 30 Dec 86 p 2

[Article by N. Boyarkina]

[Abstract] More than 3 years have elapsed since a new apparatus for treating nerve deafness was proposed by the physician Yu. Mironenko and the engineers G. Meyerson and V. Moskalev. After preliminary testing of this apparatus, designated MBS-3M, at the Scientific Research Institute of Pediatrics, with apparently successful results, everything appears to have been forgotten. To date, KOMSOMOLSKAYA PRAVDA has received some 7,000 inquiries from hopeful patients, and some letters from physicians accusing this paper of sensationalism because the apparatus is nowhere to be found. On the face of it, this case appears to be just another round of administrative botching and forgetfulness, and it has been impossible to pin-point anyone at the USSR Ministry of Health responsible for a complete evaluation of MBS-3M.

12172/13046  
CSO: 1840/305

## STRESS ON PREVENTIVE MEDICINE

Moscow VECHERNYAYA MOSKVA in Russian 26 Jan 87 p 2

[Article by A. Gatilov]

[Abstract] Medical-sanitation Unit #12 [Chast] was opened 5 years ago in the facilities of the outpatient (ambulatoriya) unit at the Lianozov Electromechanical Plant (LEMP); now it serves over 30,000 workers from 16 enterprises and institutions in Timiryayev Rayon. This center is adequately provided for as are its workers, so that personnel turnover is light. During these 5 years disease frequency decreased by 7.3%, the hypertension cases by 21%, ulcerative problems by 10%; sick days dropped by some 2,000 days. All this was achieved by a number of preventive measures: clean, healthy work space, health spa available to workers, etc. However, not all local work organizations appreciate the positive side of such preventive measures. A complex automated system (KASMON) will soon be introduced for medical examination [dispensarization] of the population. The entire exam lasts about 1.5 hr: a questionnaire: 7-10 min; diagnostic tests: 5-7 min; EKG: 7-10 min; eye examinations including glaucoma test and prescription of glasses when necessary: 5 min; functional tests: 20 min. The final step is the automated print out of the results of such examination.

7813/13046  
CSO: 1840/395

## PROBLEMS WITH AMBULANCE SERVICE

Moscow NEDELYA in Russian No 49, 1-7 Dec 86 pp 10-11

[Article by Eduard Andzelevich, physician, Medical Emergency Station, Moscow]

[Abstract] This article complains about medical first aid. The ambulance service [Skoraya Pomoshch] in Moscow is a disaster of the first magnitude. The poor quality of the equipment and ambulances, inefficient dispatching, and shortage of medications make for a frustrating medical experience. The so-called improvements are limited to talk and seldom followed by any appropriate action on the part of the administration, increasing even further the moral and physical burden on the overworked clinical staff. With all of these problems, it remains a mystery why no action is taken. [Editor's comment: We would welcome a substantive reply from the USSR Ministry of Health, rather than one limited to recounting past achievements.]

12172/13046

CSO: 1840/277

## EYE MICROSURGERY CENTERS WITH AUTOMATED PATIENT CONVEYANCE LINES

Moscow PRAVDA in Russian 15 Jan 87 p 4

[Article by Yu. Bychkov]

[Abstract] An automated patient conveyance line has been constructed at the Moscow Scientific Research Institute of Ophthalmic Microsurgery, which is headed by Professor S.N. Fedorov. Fedorov is an ophthalmologist who devised the radial keratotomy treatment for myopia. In this procedure, a number of concentric lines are cut in the cornea with a special diamond knife in a manner designed to modify the curvature of the cornea in such a manner as to improve focus. With the automated conveyance line, the patients are moved from specialist to specialist for the individual steps in the operation. The entire surgical team consists of five physicians who, working in this manner, can carry out the procedure in 7 minutes or less. Plans have been made to establish eye microsurgery centers across the RSFSR. Once this plan comes to fruition, it is expected that some 200,000 radial keratotomies will be performed per year.

12172/13046

CSO: 1840/310

## IMPROVEMENT NEEDED IN USSR MASS HEALTH SCREENING

Moscow SOVETSKAYA ROSSIYA in Russian 9 Jan 87 p 3

[Article by A. Moskvichev, deputy minister, USSR Ministry of Health]

[Abstract] The USSR Ministry of Health is reported to appreciate the concerns of N.M. Amosov, academician of the UkrSSR Academy of Sciences, about the current state of health in the USSR and the problems with dispensarization (the national mass health screening program), as expressed in the interview published in SOVETSKAYA ROSSIYA, 12 Sep 86. Steps are being taken to provide instructions and implement other measures, e.g., education of the medical personnel, diminish the volume of paper work, and improve the medical facilities to the level where such a program can be carried out in an efficient and rational manner. In addition, agreements have been reached with a number of medical supply and equipment manufacturers for timely delivery and improvements in the quality of the products. Disciplinary measures are being enforced with increasing frequency in cases of documented malpractice and additional training courses have been instituted to supplement existing post-graduate training programs. An open discussion is an absolute prerequisite for solving existing problems and for anticipating any future difficulties.

12172/13046

CSO: 1840/304

UDC 614.27

## UTILIZATION OF DRUG RESOURCES AT CARDIOLOGICAL CLINICS

Kiev FARMATSEVTYCHNYY ZHURNAL in Ukrainian No 6, Nov-Dec 85 (manuscript received 18 Apr 85) pp 57-59

[Article by V.M. Tolochko and M.A. Alyushina, Kharkov State Pharmaceutical Institute]

[Abstract] An analysis was conducted on the efficiency of drug use by physicians at the Ukrainian Cardiological Dispensary in Kharkov. Analysis of the data for five departments demonstrated that the general efficiency ranged from 50 percent in most departments, to 80-100 percent in the intensive care unit. The data also revealed that considerably greater efficiency and cost effectiveness could be attained by the use of proper dosage forms and vehicles, as well as concentrations and volumes. All too often, on-site preparation of drugs results in too large a bulk that cannot be used in a given department before expiration time. The pharmaceutical industry should also take steps to provide drugs and other medications in clinically useful concentrations and volumes that would preclude on-site adjustments. Tables 1; references 3 (Russian).

12172/13046

CSO: 1840/351

## MEDICAL INCOMPETENCE IN GEORGIAN SSR

Tbilisi ZARYA VOSTOKA in Russian 23 Dec 86 p 2

[Article by Ketevan Amiredzhibi]

[Abstract] A phenomenon that has caused considerable concern in Georgian medical circles and in ministries at the highest levels has been a rise in the number of Georgians seeking medical care in other republics. There are many reasons for this, but the underlying problem is one of poor medical care in Georgia, poor facilities, neglect of research in medical sciences, unmotivated medical personnel, and administrative blundering. A medical conference recently held in Tbilisi discussed these problems openly, as well as shortcomings in the training of physicians, and medical malpractice. This can be regarded as a first step toward addressing this acute problem in a resolute way.

12172/13046

CSO: 1840/309

UDC 614.27

## PLANS FOR FURTHER IMPROVEMENTS IN PHARMACY SERVICES

Kiev FARMATSEVITYCHNYY ZHURNAL in Ukrainian No 3, May-Jun 85 (manuscript received 10 Apr 85) pp 8-14

[Article by V.G. Varchenko, Main Pharmaceutical Administration, Ukrainian SSR Ministry of Health]

[Abstract] A meeting held in December 1984 at the UkrSSR Ministry of Health covered the current status of pharmacy services in Ukraine, with the keynote address delivered by the UkSSR Minister of Health A.Yu. Romanenko. Despite considerable progress in recent years, there remain many problems to be surmounted in health care delivery and availability of medicinal preparations. One of the major factors having an adverse impact on the availability of drugs in the Ukraine is an inadequate distribution system that fails to meet local needs, and the attendant lack of responsiveness to changing situations. In addition, Soviet production of many drugs lags behind other countries, necessitating import of many agents that could be produced internally. Finally, lack of coordination and cooperation between and among medical, pharmaceutical, and public health personnel further complicates health care delivery in the Ukraine and places the success of the mass screening program [dispensarization] in doubt. Problems of this kind have to be discussed openly, and steps to correct the situation must be taken in a resolute manner. The UkSSR Ministry of Health has issued order No 734, dated December 28, 1984, for reorganization of drug research and delivery in the Ukraine and it is to go into effect on November 1, 1985.

12172/13046

CSO: 1840/328

## USING COMPUTERS IN KIEV OBLAST PHARMACY NETWORK

Kiev FARMATSEVITYCHNYY ZHURNAL in Ukrainian No 3, May-Jun 85 (manuscript received 20 Dec 84) pp 19-22

[Article by Ye.F. Pakrysh, Kiev Pharmacy Administration, Oblast Executive Committee]

[Abstract] A historical review is presented of the development of computer-based data processing in the Kiev Oblast Pharmacy Service, installed to render the entire operation of timely drug supply cost-effective and efficient. Description is provided of the rationale used to design local information retrieval systems and their implementation, and the computer time required for the individual operations. To date, the system has released 30 workers from manual inventory and supply monitoring. The implementation of an automatic control system has added considerable flexibility to the pharmacy service in meeting rapidly changing local needs, and in providing physicians and pharmacists with timely drug information.

12172/13046

CSO: 1840/328

## HEALTH MORE VALUABLE THAN WEALTH

Moscow PRAVDA in Russian 15 Sep 85 pp 1-3

[Article by A. Chernyak]

[Abstract] Human health is a subject of high concern to the government. In the USSR a wide net of polyclinics, hospitals, medical institutes and apothecaries has been established. More than 170,000 physicians and 3,200,000 medical technologists are employed in this network. During the 11th Five-Year Plan an increase of 300,000 patient beds was realized. New prevention programs were set for the 1985-1990 period. Physicians became involved in environmental protection programs. However, there were also some negative aspects: Over 66,000 complaints were received about medical service resulting from overcrowding, understaffing, inadequate support of specialists and poor first aid service. Some of these complaints are due to inadequate local medical service which tends to create a snowball effect at the Centers of Specialization, especially in Moscow. Part of the problem is overburdening by bureaucratic regulations. Shortage of nurses was noted along with impersonal treatment by medical staff. However, the thrust of this commentary is best expressed with the truism: One must strive for every day to match words with deeds. Inefficient bureaucracy would appear to be dominating the Soviet health service system.

7813/13046

CSO: 1840/1011

## RADIATION BIOLOGY

### NEW MEDICAL CENTER IN KIEV

Kiev RABOCHAYA GAZETA in Russian 2 Oct 86 p 4

[Article by N. Pastushenko]

[Abstract] On 1 Oct 86 the All-Union Scientific Center for Radiological Medicine, USSR Academy of Medical Sciences was opened in Kiev. This is reported in an interview with P. Perekhrestenko, Director of Main Administration of Scientific Research Studies, UkSSR Ministry of Health. Three institutes were joined in this center: i) Scientific Research Institute of Epidemiology and Prophylaxis of Radiation Disease, ii) Scientific Research Institute of Clinical Radiology and iii) Scientific Research Institute of Experimental Radiology. This Center is in early stages of organization and presently has no separate facilities; its various components are housed in other existing institutions in and around Kiev. Since such a solution is not practical for the long term, a separate facility will be constructed during the current Five-Year Plan to house various laboratories and clinics.

7813/13046

CSO: 1840/1026

UDC 577.391;621.386.86;611.36

### CYCLIC NUCLEOTIDE LEVELS IN PROLIFERATING RAT HEPATOCYTES AFTER IRRADIATION AND SEROTONIN TREATMENT

Moscow RADIOBIOLOGIYA in Russian Vol 25, No 3, May-Jun 85 (manuscript received 9 Apr 84) pp 324-327

[Article by L.I. Aslamova, Ya.B. Blyum, B.A. Tsudzevich and N.Ye. Kucherenko, Biological Faculty, Kiev State University imeni T.G. Shevchenko]

[Abstract] Outbred male rats (120-150 g) were used as a model system to evaluate the effects of cycloheximide (CHI) administration alone or followed by x-ray irradiation, as well as the protective effects of serotonin treatment, on the hepatocyte levels of cAMP and cGMP. CHI was administered i.p. (0.2 mg/kg), followed in 3 h by 0.21 C/kg x-ray irradiation. Serotonin was injected i.p. 5 min before irradiation in a dose of 60 mg/kg. Monitoring

the animals for 84 h demonstrated that irradiation depressed the levels of cAMP and cGMP, indicating inhibition of transcription and replication. The effects of serotonin were to reverse the effects of irradiation in the proliferating hepatocytes and elevate the levels of both cyclic nucleotides. These observations indicated that both cyclic nucleotides worked in tandem in regulating cellular processes and that their correlation with the radioprotective effects of serotonin are to be seen in that light, rather than as 'endogenous radioprotectors.' Figures 2; references 12: 9 Russian, 3 Western.

12172/13046  
CSO: 1840/249

UDC 577.391;611.8.591.48

#### EFFECTS OF HIGH-DOSE GAMMA/NEUTRON IRRADIATION ON NEURONAL ULTRASTRUCTURAL DYNAMICS IN RAT SENSOMOTOR CORTEX

Moscow RADIOBIOLOGIYA in Russian Vol 25, No 3, May-Jun 85 (manuscript received 30 May 84) pp 338-342

[Article by A.A. Abdrakhmanov, A.L. Kachurin, V.F. Mashanskiy, Ye.V. Ozirskaya and A.G. Sverdlov, Leningrad Institute of Nuclear Physics imeni B.P. Konstantinov, USSR Academy of Sciences, Gatchina]

[Abstract] Ultrastructural studies were conducted on the sensomotor cortex of male Wistar rats (180-200 g) subjected to whole-body 10 Gy gamma/neutron irradiation (to expand the scope of knowledge on the cerebral aspect of radiation injury with this form of radiation exposure). Electron microscopic assessment of layer V over a period lasting from 15 min to 6 h after irradiation demonstrated that ultrastructural alterations were evident immediately. These changes indicated marked activation of the neurons, as demonstrated by alterations in the synaptic apparatus, the mitochondria, and the endoplasmic reticulum. The synaptic evidence consisted of appearance of a large number of vesicles, enhanced electron density of the mitochondria, and dilation of the endoplasmic reticulum. Subsequently, evidence of activation was replaced by ultrastructural evidence of a diminished functional status. Figures 1; references 18: 12 Russian, 6 Western.

12172/13046  
CSO: 1840/249

EFFECTS OF CYSTAMINE ON DEGRADATION OF LEUKOCYTE CHROMATIN OF RATS IRRADIATED WITH IONIZING OR COMBINED IONIZING + HEAT RADIATIONS

Moscow RADIOBIOLOGIYA in Russian Vol 25, No 3, May-Jun 85 (manuscript received 5 Nov 84) pp 370-372

[Article by N.A. Pechenina, N.I. Ryabchenko and R.S. Budagov, Scientific Research Institute of Medical Radiology, USSR Academy of Medical Sciences, Obninsk]

[Abstract] A study was conducted to assess the indicator value of cellular levels of polydeoxyribonucleotides (PDRN) in reflecting radiation injury. The model system employed consisted of male Wistar rats (160-200 g) subjected to whole-body 9 Gy gamma or gamma + heat burn (15% body surface) irradiation. In addition, the therapeutic efficacy of cystamine was evaluated by the i.p. administration of 90 mg/kg of the agent. Determination of 30-day survival figures demonstrated that 9 Gy gamma irradiation led to death of 100% of the animals with an average survival time of 8.6 days. Administration of cystamine to the gamma-irradiated animals yielded a 35% survival rate and a mean survival time of 14.3 days. Combined gamma + heat exposure reduced the mean survival time to 6.6 days, while treatment of these animals with cystamine increased this parameter to 8.2 days and a 1.5% survival rate. Concomitant evaluation of leukocyte PDRN levels over a 48 h period demonstrated highest levels, increasing with time, in the rats subjected to gamma irradiation and combined gamma + heat irradiation. The rise of PDRN was reduced to a statistically significant degree in all cases by the administration of cystamine. Although cystamine appeared to have reduced or mitigated the extent of radiation-induced DNA damage, PDRN levels appear not to have reflected the full systemic scope of radiation injury. Figures 1; references 3 (Russian).

12172/13046  
CSO: 1840/249

EFFECTS OF LONG-TERM IRRADIATION ON QUALITATIVE AND QUANTITATIVE CHANGES IN BLOOD LYMPHOCYTES IN RATS

Moscow RADIOBIOLOGIYA in Russian Vol 25, No 3, May-Jun 85 (manuscript received 10 Aug 82) pp 372-375

[Article by V.V. Ivanov and V.N. Streltsova, Institute of Biophysics, USSR Ministry of Health, Moscow]

[Abstract] An assessment was conducted on changes in blood lymphocytes in outbred male rats in response to long-term (400-600 days) gamma irradiation at a rate of 0.002 to 0.35 Gy/day, for respective cumulative dosages ranging

from 0.7 to 20.0 Gy. The effects of such chronic exposure on lymphocyte counts were found to vary with the dose. With cumulative dosages in the 0.7 to 1.4 Gy range the counts were not affected. Cumulative dosages of 4.0 to 8.0 Gy led to statistically-significant elevation in the counts, while a cumulative dose of 20.0 Gy led to depression to the lower limit of normal values. Elevation of total leukocyte counts with the lower cumulative dosages was largely due to neutrophilia. In addition, with increasing cumulative gamma dosages the percentage of atypical lymphocytes increased, represented by forms described as binuclear, vacuolated and showing lytic changes. Figures 2; references 11: 10 Russian, 1 Western.

12172/13046  
CSO: 1840/249

UDC 577.391;591.81

CYTOGENETIC EFFECTS OF GAMMA QUANTA AND OF SECONDARY EMISSION GENERATED BY  
70 GeV PROTONS ON CHINESE HAMSTER FIBROBLASTS

Moscow RADIOBIOLOGIYA in Russian Vol 25, No 3, May-Jun 85 (manuscript  
received 29 Aug 84) pp 375-378

[Article by A.Kh. Akhmadiyeva, G.F. Aptikayeva, I.A. Livanova, A.V. Antipov,  
Ye.N. Smirnova and Ye.E. Ganassi, Institute of Biological Physics, USSR  
Academy of Sciences, Pushchino]

[Abstract] An asynchronous culture of Chinese hamster fibroblasts, clone 431, was used to study the cytogenetic sequelae of 1-5 Gy gamma irradiation (1.2-1.4 Gy/min) and of the secondary emission of 70 GeV protons (0.5-15 Gy, 1 Gy/min). Irradiation of the cells in the G<sub>2</sub> phase demonstrated that with both forms of radiation a linear dose-effect relation was obtained in terms of chromosomal abnormalities and on the basis of the micronuclear test. Both procedures yielded an RBE value of ca. 3 in the case of the secondary emission of the 70 GeV protons. However, significant differences were noted in the type of abnormalities induced, with the incidence of isochromatid deletions due to the secondary emission exceeding 4-fold that obtained with gamma irradiation. Similarly, exchanges were 5-fold greater with the secondary emission. Studies with the addition of caffeine failed to increase the frequency of chromosomal abnormalities with the secondary radiation, but did so with gamma radiation. These observations were interpreted to indicate that the enhanced RBE of the secondary emission of 70 GeV protons was largely due to inhibition of cytogenetic repair processes. Figures 1; references 9: 7 Russian, 2 Western.

12172/13046  
CSO: 1840/249

## DNA DAMAGE AND REPAIR IN CHINESE HAMSTER FIBROBLASTS AFTER IRRADIATION WITH GAMMA QUANTA AND SECONDARY EMISSION GENERATED BY 70 GeV PROTONS

Moscow RADIOBIOLOGIYA in Russian Vol 25, No 3, May-Jun 85 (manuscript received 29 Aug 84) pp 378-380

[Article by A.Kh. Akhmadiyeva, S.I. Zaichkina, I.I. Livanova, A.V. Antipov, Ye.N. Smirnova and Ye.E. Ganassi, Institute of Biological Physics, USSR Academy of Sciences, Pushchino]

[Abstract] A study was conducted on DNA damage and repair mechanisms involved in gamma radiation and secondary emission of 70 GeV protons in order to elucidate the reason for an RBE of ca. 3 in the latter case. The study employed Chinese hamster fibroblasts, clone 431, exposed to 5-15 Gy gamma irradiation or 5-15 Gy secondary emission of 70 GeV protons. Comparison of the damage yield with increasing dose for both types of radiation resulted in completely overlapping plots. In addition, repair plots showed similar agreement. These observations indicated that there were no significant differences between the DNA damage-inducing and repair mechanisms. The high RBE for the secondary emission may have been due to damage of DNA segments responsible for structural integrity of the DNA molecule in its entirety. Figures 1; references 15: 8 Russian, 7 Western.

12172/13046  
CSO: 1840/249

## EARLY CHANGES IN LEVELS OF GABA AND GLUTAMATE AND AMINOTRANSFERASE ACTIVITIES IN RAT BRAIN FOLLOWING WHOLE-BODY LETHAL GAMMA IRRADIATION

Moscow RADIOBIOLOGIYA in Russian Vol 25, No 3, May-Jun 85 (manuscript received 23 Jun 84) pp 384-388

[Article by V.A. Rozanov and G.A. Karpovich, Odessa Medical Institute imeni N.I. Pirogov]

[Abstract] A neurochemical study was conducted on the cerebral manifestations of absolutely lethal irradiation with gamma rays to ascertain the involvement of the GABA-ergic system. Male Wistar rats (240-260 g) were subjected to a 30 Gy gamma irradiation and monitored for 48 h for changes in brain levels of GABA and glutamate, and changes in the activities of GABA-alpha-ketoglutarate, alanine, and aspartate aminotransferases. Analysis of the data for the brain stem, the cerebellum, and the cerebral cortex revealed basically moderate fluctuations in the levels of GABA and glutamate, as well as in GABA-alpha-ketoglutarate aminotransferase activity. However, within 60 min of irradiation, GABA levels were elevated in the cerebellum, but depressed in the brain stem and the cortex, while the inverse held true for

GABA-alpha-ketoglutarate aminotransferase. The enzymatic activity was markedly elevated in all three formations after 24 h, and significantly depressed in 48 h. Changes in the activities of the aspartate and alanine aminotransferases were much more profound and followed similar patterns in all three brain structures. A period of initial depression during the first 6 h was replaced by marked enhancement of activities by 24 h, which persisted for another 24 h. These observations confirm that radiation injury is accompanied by marked changes in the neurotransmitters GABA and glutamate, which may be a highly significant pathogenetic feature. References 11: 7 Russian, 4 Western.

12172/13046  
CSO: 1840/249

UDC 577.391;612.419;612.01.017.1

EFFECTS OF SYNTHETIC POLYRIBONUCLEOTIDES ON IMMUNE AND COLONY-FORMING  
ACTIVITY OF IRRADIATED BONE MARROW CELLS

Moscow RADIOBIOLOGIYA in Russian Vol 25, No 3, May-Jun 85 (manuscript received 21 Apr 83) pp 405-407

[Article by V.G. Vladimirov, B.P. Lukashin, I.N. Morozova and A.I. Kolosov, Military Medical Academy imeni S.M. Kirov, Leningrad]

[Abstract] Trials were conducted with several synthetic polyribonucleotides to define their scope of action in stimulating the immune system in male BALB/c mice (20 g). The animals were gamma irradiated with 5-7 Gy doses in the different experiments, followed by 2 h i.p. administration of 125 mg/kg of the nucleotide. Assessment of splenic antibody-forming cells in response to challenge with SRBC demonstrated that polyA:U (60% AMP, 40% UMP) was the most efficient polyribonucleotide in maintaining high splenic counts. Next in effectiveness was polyC, followed in turn by polyI and then polyA. However, when assessed in terms of endogenous colony-forming units the inverse relationship prevailed, with a correlation coefficient of -0.972. The synthetic polyribonucleotides were shown to be highly efficient immunostimulants in irradiated BALB/c mice, and suggested the possibility of selective control differentiation of hemopoietic stem cells. References 10: 7 Russian, 3 Western.

12172/13046  
CSO: 1840/249

## PROPHYLACTIC USE OF 2-AMINO-2-THIAZOLINE (2-AT) IN PROTECTION OF HEMOPOIETIC SYSTEM IN IRRADIATED ANIMALS

Moscow RADIOBIOLOGIYA in Russian Vol 25, No 3, May-Jun 85 (manuscript received 19 Sep 84) pp 407-410

[Article by M.I. Yanushevskaya, O.N. Rakhmanina, M.M. Konstantinova and A.A. Mandrugina, Institute of Developmental Biology imeni N.K. Koltsov, USSR Academy of Sciences, Moscow]

[Abstract] Trials were conducted on male and female (CBA x C57Bl/6) $F_1$  mice (18-24 g) to assess the effects of 2-AT (8-10 mg/mouse, s.c.) administered 60 min before irradiation (6-7.5 Gy x-rays). In the 7.5 Gy experiment, administration of 2-AT increased the 30-day survival rate to 87.3% vs. a control rate of 2.1%. Studies on the enumeration of bone marrow karyocytes demonstrated that 2-AT was most effective in facilitating the recovery of animals subjected to 6 Gy irradiation, and less so at higher doses. Spleen weight determinations resulted in a similar observation. Administration of 2-AT immediately after irradiation was less effective, and in all cases limited to the 6 Gy dose. These observations point to the increase of endogenous colony-forming units and elevation of bone marrow karyocytes as the mechanisms involved in the effects of 2-AT. References 6 (Russian).

12172/13046  
CSO: 1840/249

## RADIOBIOLOGY: POSSIBILITIES AND POTENTIALS

Kishinev SOVETSKAYA MOLDAVIYA in Russian 11 Sep 86 p 4

[Article by D. Kaushanskiy]

[Abstract] Contemporary radiobiology is used widely in agriculture, in microbiological industry and in medicine. Several examples of practical application of radiobiological techniques were given: irradiation of grape vine shoots to save them from various pests, irradiation of eggs during preincubation time to achieve increased survival of hatched chicken, treatment of seeds prior to sowing to improve the quality and quantity of future harvest, etc. Radiation disinfection of grain was used successfully in Odessa storage silos. Another way of using protective radiation is by attacking the pests themselves by exposing them to gamma rays. In genetic selection processes, radiation is widely used to provide new, more desirable mutants. However, as far as the Moldavian Republic is concerned, most of these methods are of theoretical interest; they are not being practiced at present time.

7813/13046  
CSO: 1840/1023

## CONFERENCES

UDC 616.89-008

### ALCOHOLISM AND GENETIC SCIENCE

Moscow VESTNIK AKADEMII NAUK SSSR in Russian No 1, Jan 87 pp 103-108

[Article by I.P. Anokhina, corresponding member, USSR Academy of Medical Sciences, and V.D. Moskalenko, director of medical sciences]

[Abstract] A symposium, "Alcoholism and Heredity" was held in Leningrad from 17 to 19 June 1986 with participation of many foreign scientists. Studies of alcoholism genetics, hereditary predisposition to alcoholism and its biological basis were discussed along with the effect of parents' alcoholism on their offspring. Both clinical and laboratory studies were reported. There is a definite role for special genotypes in their reaction to alcohol. The main task at this time is to decipher the biological essence of hereditary predisposition through studies of biological and genetic markers. Some of the promising studies look at high and low risk populations and attempt longitudinal prospective studies of children of alcoholics. Animal lines were developed with different tolerance to alcohol making it possible to expand the studies to the laboratory and to compare human data with animal results. To improve studies on alcoholism, a multidisciplinary approach is needed which would include psychosocial components. Special attention was given to expectant mothers who are alcoholics: Alcohol was shown to be a teratogenic agent. Preventive measures were discussed, concentrating on treatment of the mothers because medication of children is not completely effective.

7813/13046

CSO: 1840/362

## MISCELLANEOUS

### CRITICISM OF ACADEMY OF MEDICAL SCIENCES

Moscow PRAVDA in Russian 5 Nov 86 p 3

[Article by V. Burakovskiy, academician of the USSR Academy of Medical Sciences]

[Abstract] An analysis of organizational problems in science administration is presented. The program planning of the USSR Academy of Medical Sciences should benefit from the lessons of the past, from the errors committed on the route to all-encompassing health. Effectiveness of the health program should be judged by the level of morbidity and mortality. In reality, the program planning of the Academy is reduced to summarizing individual programs of the component institutes. The goals and the means are often used improperly; the scope of the activity is unimportant; achievement of the goal is discovery of the cause of disease, development of diagnostic and prophylactic measures, new therapies. Many of the scientific clinical research institutes replicate the work done in general hospitals. Current studies should be planned with current ideas and resources, using systematic approaches and not chaotic individual undertakings. Planning should lead to coordination of resources, evaluation of the end results and a feedback mechanism for further planning. To achieve some of these changes, the structure of the Academy itself should be reorganized from top to the bottom, especially the composition of various Divisions. Plans to bring various targeted Institutes into a Division of Clinical Medicine of Biomedical Sciences are opposed.

7813/13046  
CSO: 1840/359

### IMPORTANT THING IS TO BEGIN

Moscow PRAVDA in Russian 19 Jan 87 p 4

[Article by V. Gerasimov, special correspondent of Pravda, P. Dunai, special correspondent of Nepsabadshag (Hungary) and V. Viktorov, Director of All-Union Scientific Research Institute of Development of Medical Equipment]

[Abstract] In the final days of 1986, the first USSR-Hungary cooperative undertaking "Mikromed" was initiated between the All-Union Scientific

Research Institute of Development of Medical Equipment and "Medikor" company in Estergom, Hungary. This venture's goal is to produce automated diagnostic equipment for mass prophylactic examinations and microprocessors for medical applications. Director of Medikor, Ishtvan Martosh believes that this approach will make the company self-supportive by exporting their goods. Initial outlay by Medikor and the Soviet partners is 6 million rubles. The plant, housed in an old monastery, is at present under the direction of Bela Badi. Its goal is to produce items which, until now, had to be purchased for hard currency. Initial production items are: single channel EKG microprocessors and dual channel myographs. From the Soviet side, the contribution will come from the Moscow Plant "Ritm" in form of microprocessors, modules, etc. Other companies will also participate expending this project, in time, to other republics. Units developed in Medikor will be modified in Moscow, and then produced and exported from Hungary because Medikor has several outlets in the Western world. The plans call for a 100 million (rubles?) annual production in 10 years. A branch of Mikromed will soon open in Moscow. A share-and-share-alike principle will be used in fiscal accounting.

7813/13046  
CSO: 1840/1015

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