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USSR REPORT
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BIOMEDICAL AND BEHAVIORAL SCIENCES

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(S. V. Andreyenko, D. M. Grodzinskiy; DOKLADY AKADEMII
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AGROTECHNOLOGY

BRIEFS

PORTABLE CHEMICAL ANALYSIS KITS--Series production of portable laboratories for agronomic services has been assimilated by specialists of the Belorussian branch of the "Agropribor" Scientific Production Association. The kit can be set up right in the field in only 5 minutes. It fits into two small suitcases. One of these is equipped with instruments for express analysis for the presence of nitrate nitrogen, chlorine and acidity, in raw plant and soil samples. The second makes it possible to study plants for the presence of nitrates, phosphates, and potassium and to determine grain ripeness. [Text] [Minsk NARODNOYE KHOZYAYSTVO BELORUSSII in Russian No 7, Jul 86 p 2]

12809/12955

CSO: 1840/1297

BIOCHEMISTRY

UDC 616-008.9-074

SOME URGENT PROBLEMS OF BIOCHEMICAL SERVICE IN SOCIALIST REPUBLIC OF MONTENEGRO

Moscow LABORATORNOYE DELO in Russian No 7, Jul 85
(manuscript received 20 Jan 82) pp 436-438

[Article by Yovan Kavarich and Lyubisha Rakich]

[Abstract] The Public Health Secretariat of Montenegro has set up a Commission for Supervision of the Area of Laboratory Diagnosis, including two medical biochemists and one bacteriologist. The purpose of the Commission is to check the adequacy of utilization of funds and equipment considering modern achievements of medical science and technology, and to check the effectiveness of medical care, i.e., the relationship between labor invested and results achieved. For three years, the Commission monitored the work of 29 laboratories in Montenegro, performing over 3 million analyses, 2/3 of them biochemical. Problems found included nonstandardization of procedures, poor communications among laboratories, inadequacy of equipment and training in rural areas. The problems found are said to be similar to the problems of the rest of Yugoslavia.

6508/12955
CSO: 1840/2252

UDC 577.171.6(44):616-006.6

THYROID HORMONE RECEPTOR OF CANCER CELLS AS TRANSFORMING GROWTH FACTORS

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 287, No 3, Apr 86
(manuscript received 14 Nov 85) pp 721-724

[Article by A. Abdukarimov, Sh. S. Azimova, N. N. Kuznetsova and
T. G. Gulyamova, Institutes of Bioorganic Chemistry and of Biochemistry,
Uzbek SSR Academy of Sciences, Tashkent]

[Abstract] Trials were conducted with human embryo fibroblasts and Chinese hamster fibroblastoid cells cultured in 0.33% agar medium to determine whether thyroid hormone receptor derived from cancer cells may function as a transforming growth factor. It has previously been established that under such growth conditions, only transformed cells are capable of colony formation, whereas normal cells persist as isolated cells. The resultant findings demonstrated that systems with 10^{-9} to 10^{-8} M T_4 and T_3 and equimolar concentrations of normal thyroid hormone receptor failed to form colonies, with only occasional microcolonies limited to 3-5 cells. However, in systems with thyroid hormone receptor derived from cancer cells -- which differs antigenically and structurally from the normal receptor -- large colonies were detected after 2-3 weeks of incubation. These observations suggest that the receptor derived from cancer cells represents an oncogene product. Such a product, induced by chemical or physical carcinogens, would then account for the seeming cocarcinogenic function of thyroid hormones. Figures 1; references 14: 6 Russian, 8 Western.

12172/12955
CSO: 1840/450

UDC 591.813.612.015.577.42

HEAT SHOCK PROTEINS IN NUCLEAR MATRIX OF CULTURED ZAYDELA HEPATOMA CELLS

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 287, No 3, Apr 86
(manuscript received 19 Nov 85) pp 724-728

[Article by S. B. Akopov, S. N. Kuzmina, T. V. Buldayeva and I. B. Zbarskiy,
Institute of Developmental Biology imeni N. K. Koltsov, USSR Academy of
Sciences, Moscow]

[Abstract] Comparative studies were conducted on the synthesis of heat shock proteins (HSP) in the nuclear matrix of cultured Zaydela hepatoma cells and Chinese hamster fibroblast lines, to determine the capacity of malignant cells to respond to thermal challenge in this manner. The Zaydela cells were exposed to 45°C for 15 min, followed by incubation with ³⁵S-methionine at 37°C at various time intervals. The resultant data and immunochemical analysis demonstrated the formation of HSP 6 h after thermal challenge. The HSP fell into 48, 70 and 97 kdalton categories. Comparison with the 70 kdalton protein obtained from the hamster cells showed antigenic cross-reactivity. Such proteins were lacking in non-heated cells. Thus, dedifferentiated cells, as represented by Zaydela hepatoma, are capable of producing a specific HSP. However, the capacity for such de novo synthesis in the malignant cells was weakened as indicated by a greater latency period (vs. 4 h in hamster cells) and lower titers of the 70 kdalton protein. Figures 2; references 15: 1 Russian, 14 Western.

12172/12955
CSO: 1840/450

UDC 573.552:556.33:552.525

AMINO ACID THERMAL POLYCONDENSATION MODEL IN MIGRATORY AQUEOUS SOLUTIONS
IN EARTH'S LITHOSPHERE

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 287, No 2, Mar 86
(manuscript received 31 Oct 85) pp 455-459

[Article by G. A. Lavrentyev, T. F. Strigunkova, I. A. Yegorov, L. Yu.
Rakitin and L. A. Pishkunova, Institute of Biochemistry imeni A. N. Bakh,
USSR Academy of Sciences, Moscow]

[Abstract] A stainless steel reactor was employed in thermal polycondensation studies of a mixture of amino acids in an aqueous environment. In the reactor, kaolinite catalyst (<170 mesh) was alternated with Pyrex (2-3 mm). Sodium azide was employed to ensure sterility of the system. Polycondensation of the amino acids was detected in systems with a pressure of 20 atm., 200°C, and an amino acid concentration of 10^{-2} M. The abiogenic synthesis products were enriched in lysine (which shows a high degree of adsorption to kaolin), and also contained serine (lacking in the initial mixtures). The conditions employed, therefore, favored the formation of peptide bonds and new amino acids (serine) which participated in polycondensation. These findings further substantiate the view that such syntheses could have taken place in the primitive Earth's lithosphere, as well as in present-day lithosphere, particularly in areas with active volcanic activity. Figures 2; references 13: 3 Russian, 10 Western.

12172/12955
CSO: 1840/449

PUTATIVE RELATIONSHIP BETWEEN ELECTROMAGNETIC AND ACOUSTIC EMISSIONS OF
LIVING CELLS

Tbilisi SOOBASHCHENIYA AKADEMII NAUK GRUZINSKOY SSR in Russian Vol 122, No 3,
Jun 86 (manuscript received 15 May 84) pp 617-620

[Article by M. Ye. Perelman, Institute of Cybernetics, Georgian SSR Academy
of Sciences]

[Abstract] A mathematical treatment is presented to demonstrate that living cells are capable of emitting ultrasonic signals, representing ultrasonic fluctuations in the cell membrane, due to ionic current fluxes, as well as to absorption of electromagnetic radiation--generated by the cell itself--by the membrane. Treating the bilayer cell membrane as a condenser made it possible to demonstrate synchronous generation of acoustic and electromagnetic emission on compression of the two layers, and to show that high frequency electromagnetic emission forces aperiodic contact between the two layers of the membrane. The conversion of high frequency electromagnetic emission into lower frequency acoustic emission occurs at alternating potentials with amplitudes in the 10^{-2} to 1 mV range, well within the standard membrane potential of 50 mV. References 9: 6 Russian, 3 Western.

12172/12955

CSO: 1840/446

ENVIRONMENT

UDC 577.391:577.4/46

RADIOECOLOGIC ASSESSMENT OF ECOSYSTEMS IN VICINITY OF BELOYARSK NUCLEAR
POWER STATION

Sverdlovsk EKOLOGIYA in Russian No 5, Sep-Oct 85
(manuscript received 29 Nov 84) pp 30-34

[Article by I. V. Molchanova, Ye. N. Karavayeva and N. V. Kulikov, Institute
of Plant and Animal Ecology, Urals Science Center, USSR Academy of Sciences]

[Abstract] Long-term (1978-1981) monitoring was conducted on the environmental levels of Sr-90 and Cs-137 within a 5 km area of the Beloyarsk Nuclear Power Plant (Sverdlovsk Oblast). The tabulated data for the river beds and adjacent wetlands, as well as water levels of the radionuclides, showed rather insignificant variation with time. The water counts were one to two orders of magnitude below the permissible concentration for drinking water. Although the concentrations of the radionuclides in the bottom deposits were 100- to 1000-fold greater than in the river water, there was virtually no transfer to the topsoil level. Periodic flooding of the wetlands resulted in elevated soil levels of Cs-137; however, at a distance of 0.5 to 1 km from the wetlands the soil levels were essentially unaffected. References 8: 4 Russian, 4 Western.

12172/12955
CSO: 1840/014

UDC 546.264:551.551

EFFECTS OF VARIABLE $^{14}\text{CO}_2$ CONCENTRATIONS IN AIR ON ^{14}C BEHAVIOR IN
ATMOSPHERE-PLANT SYSTEM

Sverdlovsk EKOLOGIYA in Russian No 5, Sep-Oct 85
(manuscript received 22 May 84) pp 24-29

[Article by Ye. A. Fedorov, R. P. Ponomareva and L. A. Milakina]

[Abstract] Mathematical rationale is presented for the assessment of the behavior of ^{14}C in the atmosphere-plant system in situations with variable air concentrations of $^{14}\text{CO}_2$. Using the bean plant (Russian black) as the model system in laboratory studies resulted in the demonstration that the T_1 for the elimination of ^{14}C from the plants increases with intensity of exposure to $^{14}\text{CO}_2$ due, presumably, to the increase in the fraction of ^{14}C in high MW storage and structural carbohydrates characterized by low levels of metabolic activity. Equilibrium situation for ^{14}C is attained in ca. 78 days in the case of bean leaves, but requires more than 100-110 days for the other organs and tissues. The specific activity of ^{14}C in the plants may either be greater, lower, or equivalent to that in the air, depending on the physiological state of the plants and the degree of intermittent exposures to $^{14}\text{CO}_2$. The specific activity for the different organs and tissues varies about six-fold, and the T_1 values for elimination of ^{14}C from the different plant components differ 1.5- to 26-fold. Figures 1; references 10: 7 Russian, 3 Western.

12172/12955
CSO: 1840/014

EPIDEMIOLOGY

UDC 579.841.11.083.13

MEDIUM FOR DETECTION OF ARGININE DIHYDROLASE AND LYSINE AND ORNITHINE DECARBOXYLASES IN PSEUDOMONADS

Moscow LABORATORNOYE DELO in Russian No 5, May 86
(manuscript received 28 May 85) pp 306-308

[Article by S. A. Gabrielyan, T. B. Safonova and L. A. Taranenko, Department
of Microbiology, Central Order of Lenin Institute for the Advanced Training
of Physicians, Moscow]

[Abstract] Rapid and reliable identification of *Pseudomonas aeruginosa* is difficult, due to the rather high frequency of detection of atypical strains, which do not form pigment and do not have the characteristic trimethylamine aroma. A second problem is the increasing significance of gram-negative bacteria similar in morphology and biochemistry to *Pseudomonas aeruginosa* in human infectious pathology. The authors have developed a medium for detection of enzymes which take part in amino acid utilization by pseudomonads. The medium is prepared using the same ingredients which are used for the generally-accepted medium for amino acid testing but in a different ratio: twice as much glucose, 1/5th as much peptone as in the standard medium. The laboratory procedure is briefly described. References 7: 3 Russian, 4 Western.

6508/12955
CSO: 1840/2258

UDC 616.936-07:616.155.1-074

METHODS OF CONCENTRATION OF ERYTHROCYTES DAMAGED BY THE MALARIA PARASITE
AND "FREE" PARASITES (LITERATURE REVIEW)

Moscow LABORATORNOYE DELO In Russian No 5, May 86
(manuscript received 23 May 85) pp 259-261

[Article by A. M. Allakhverdiyev and D. A. Nushtayev, Institute of Medical
Parasitology and Tropical Medicine imeni Ye. I. Martsinovskiy, USSR Ministry
of Health, Moscow]

[Abstract] Methods have been developed which allow concentration of damaged erythrocytes or free parasites and also allow collection of parasites of the same age. The methods are based on various differences between damaged and intact erythrocytes and between erythrocytes containing parasites of varying degrees of maturity. Most methods are based on the fact that damaged erythrocytes are lighter in weight than intact ones, and that the density of the erythrocytes decreases with maturation of the parasite, allowing centrifugation to separate them. Gelatin can also be used to concentrate erythrocytes containing pure parasites without the need for centrifugation. Damaged erythrocytes have also been found to have less electrophoretic mobility, and methods have been suggested for separation of normal and damaged erythrocytes using electrophoretic methods. References 34: 6 Russian, 28 Western.

6508/12955
CSO: 1840/2258

UDC 599.32.2:616.981.452-036.21

FLUCTUATION IN POPULATION OF LITTLE SUSLIK IN PLAGUE NATURAL FOCUS OF
NORTHWESTERN CASPIAN REGION OVER 50 YEARS (1932-1982)

Moscow EKOLOGIYA in Russian No 1, Jan-Feb 86
(manuscript received 22 Feb 84) pp 58-64

[Article by I. Z. Klimchenko, P. A. Petrov, V. A. Myalkovskiy, Z. S. Sorokina,
M. G. Yakovlev, I. I. Denisenko and A. F. Optyakova, Scientific Research
Antiplague Institute of the Caucasus and Transcaucasus, Stavropol]

[Abstract] Data on changes in the population of the Little Suslik in the northwestern Caspian natural focus of plague reflect the epizootic status of the focus and allow determination of its contemporary status and reasons for activation, and development of an effective plan for plague prevention. This article summarizes the dynamics of Little Suslik population in this area between 1932 and 1982. The effect of anthropogenic factors such as plowing and pasturing of cattle is noted. Interruption of extermination during the war resulted in an increase in the population. In spite of continued extermination efforts since the war, in a number of areas the Little Suslik continues to serve as a host to the plague pathogen, while in others they are no longer significant in this role. References 23 (Russian).

6508/12955
CSO: 1840/2262

FOOD TECHNOLOGY

FAR EASTERN SCIENCE CENTER STUDIES IN SOIL SCIENCE AND MARINE BIOLOGY

Moscow SOVIETSKAYA ROSSIYA in Russian 27 Jul 86 p 1

[Interviews with Academician V. Ilichev, chairman of the USSR Academy of Sciences' Far Eastern Scientific Center; A. Zhirmunskiy, USSR Academy of Sciences Corresponding Member, director of the Institute for Marine Biology; P. Ler, doctor of biological sciences, director of the Soil Biology Institute; date and place not given; by special correspondents I. Kots, v. Mamontov, N. Mikhaylov; text in slantlines printed italic]

[Text] /Academician V. Ilichev, chairman of the USSR Academy of Sciences' Far Eastern Scientific Center: /

Once again it has been asserted: for us restructuring means the fundamental destruction of the Far East's existing image as only an extractive region. In the 16 years of its existence the DVNTs [Far Eastern Science Center] has explored several fields and intensely studied the ocean's resources... But we are all acutely interested in our region becoming a major, balanced industrial-agrarian region. The meeting correctly emphasized: accelerating existing wealth requires another, higher level of organization of research and a close relationship between research and practice.

Or take an urgent problem such as studying the ocean. We now have no special department which is responsible for developing oceanic technology, so we must go begging to foreign companies. At the same time, domestic research institutes are developing satisfactory prototypes of oceanological instruments. We must be bolder in creating design bureaus with experimental production facilities.

/A. Zhirmunskiy, USSR Academy of Sciences Corresponding Member, director of the Institute for Marine Biology: /

Unfortunately, I, too, discussed this with Mikhayl Sergeyevich, whom we most often confront with the compartmentalization of scientific forces, with a narrow departmental approach. As a result, industrial and academic science often duplicate each other or are occupied "divvying up" spheres of influence, so that both theory and practice suffer. The Far East is the country's main fishing pond -- it provides more than one-third the union-wide catch. However, about 80 percent of the fish caught are of two types:

pollack and herring- and- Far East-sardines. As you know, such canned fish are not in demand, although warehouses are packed with them. For many years we have been questioning the need to develop mariculture -- to explore for valuable species of fish, algae, mollusks, etc. But only recently have relations between our institute and the "Dalryba" All-Union Production Amalgamation been outlined, and a joint program of action developed. Today we are conducting active studies to supply the country with agar-agar, a quite valuable product obtained from marine algae.

It is believed that socialist cooperation within the framework of CEMA can help. Experience in joint work with Vietnamese geologists in this direction is already promising. It seems to me that our proposal interested Mikhail Sergeevich.

/P. Ler, doctor of biological sciences, director of the Soil Biology Institute:/

It was correctly noted that the main thing in restructuring is the destruction of routine thinking and conservative ideas. There are divergent opinions on the inevitability of the backwardness of agriculture in the Far Eastern region -- unfavorable climate, low soil fertility, dry spring, rainy autumn... It is already a habit to refer to this. However, farms with high standards, those who support close contacts with science usually produce stable harvests. For example, the "Urozhaynyy" sovkhoz in Chuguyevsk Rayon successfully uses a technology for raising potatoes on a virus-free base. The yield doubles! Our Soil-Biology Institute is working on creating just such varieties.

Creation of an orderly, scientifically justified plant protection system will make it possible to actually diminish this huge chain of events.

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CSO: 1840/1297

GENETICS

UDC 575.155 + 581.143.6

INCREASED AMOUNTS OF NUCLEAR DNA DURING ALKALOID BIOSYNTHESIS IN SERPENTINA RAUWOLFIA CELL CULTURE

Kiev DOKLADY AKADEMII NAUK UKRAINSKOY SSR. SERIYA B: GEOLOGICHESKIYE,
KHIMICHESKIYE I BIOLOGICHESKIYE NAUKI in Russian No 7, Jul 86
(manuscript received 1 Nov 85) pp 62-75

[Article by V. A. Kunakh, I. A. Kostenyuk and A. G. Vollosovich, Institute
of Molecular Biology and Genetics, UkSSR Academy of Sciences, Kiev]

[Abstract] Nuclear DNA content was determined cytophotometrically in various strains of cell cultures differing in their productivity, as well as in the intact plants of rauwolfia serpentina Benth. These cultured cells represented mixoploid cell populations with predominance of polyploid cells. These strains showed a wide range of nuclear DNA content. During transition to secondary metabolish processes (accumulation of alkaloids), the cellular quantity of DNA per nucleus increased drastically, this increase being more pronounced in the more productive strains. Thus, it was shown that increased synthesis of alkaloids in rauwolfia serpentina cell cultures is preceded by intensive endoreplication of the nuclear DNA. Figures 4; references 9: 6 Russian, 3 Western.

7813/12955
CSO: 1840/447

UDC 575.1+581.134.4:633.13"321'

OAT PROLAMINE INHERITANCE AND GENETIC CONTROL SYSTEM IN AVENA SATIVA

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 287, No 2, Mar 86
(manuscript received 6 Nov 85) pp 439-441

[Article by V. A. Portyanko, A. A. Pomortsev, N. A. Kalashnik and
A. A. Sozinov, academician, UkSSR Academy of Sciences, Institute of General
Genetics imeni N. I. Vavilov, USSR Academy of Sciences, Moscow]

[Abstract] Polyacrylamide gel electrophoretic analysis was carried out on *Avena sativa* prolamines (avenins) to establish the mode of inheritance and genetic control system in this species. Data considered here dealt with F_1 and F_2 seeds obtained from a Kelsy x Narymskiy 943 crossing. On the basis of cluster analysis and evaluation of filial segregation demonstrated that the different avenin blocks (A1 and A2, B1 and B2, and C1 and C2) were controlled by alleles at three different loci (designated A, B and C). Furthermore, there was no evidence of linkage among the loci. These facts also provided a basis for recording the avenin electrophoretograms in the form of genetic formulas, resulting in the description of Narymskiy 943 oat as Avn A1 B1 C1 (abbreviated to 1.1.1), and Kelsy as Avn A2 B2 C2 (2.2.2). The genetic data, then, are indicative of codominant inheritance under the control of three independent loci. Figures 2; references 5: 3 Russian, 2 Western.

12172/12955
CSO: 1840/449

INVESTIGATION OF MICROSTRUCTURE OF ARBITRARY MOTIONS OF OPERATOR

Tbilisi SOOBSHCHENIYA AKADEMII NAUK GRUZINSKOY SSR in Russian Vol 121 No 2, Feb 86 pp 369-372

[Article by G.G. Tsulaya, Corresponding Member of the GSSR Academy of Sciences M.V. Khvingiya, I.F. Chekirda, and V.V. Danilovtsev from the Machine Mechanics Institute of the GSSR Academy of Sciences]

[Text] Under normal conditions, alternating micromotor processes are inherent to the human body in any physiological and functional state. These processes are mainly connected with changes in the joint angles (physiological tremor).

It is also known that certain random human motions are irregular, i.e., the speed of a moving member increases or decreases in the microintervals of the total time of a motion. The construction of random motions consisting of different sequential phases is known in the literature [1] as the microstructure of a motion.

If tremor and the microstructure of motions are viewed as necessary physiological factors for executing one motor function or another, it is nevertheless necessary to consider that they are errors during the execution of an entire series of operations. Therefore, the search for possible ways of reducing them is a pressing practical task. This holds especially true for the activity of an operator where the precision of executing a control task has a decisive value.

The purpose of the present research is to study the spectral composition of a tremor and the microstructure of random motions connected with the control tasks of an operator's activity.

Figure 1 presents a flowchart of the experiment research. It includes an operator's chair (1) with a control stick, a sensor for physical quantities, a special stand equipped with a system to test and register physiological information (2), and also a magnetic store (3). The subsequent processing of the electrical quantities that have been recorded is carried out by a third-octave signal analyzer (4).

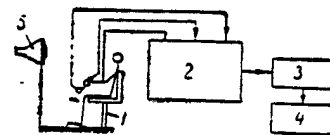


Figure 1.

Operator activity tasks involved in executing the multidimensional tracking of a dynamic object with different dynamic characteristics were used under the conditions of the experiment. The tracking was done on the television screen of a picture monitor (5) based on the types of target tracking most frequently encountered in operator practice: shift, speed, and acceleration. Under these conditions the position of the operator's control stick corresponded to the specified values of the indicated parameters in the plane of the picture monitor's screen.

While sitting in a comfortable chair and resting his or her forearm on an elbow rest, the operator executed tracking tasks of varying complexity with his or her wrist. The combined motion of the "wrist-control stick" system was registered with the help of two transducers. The first of these, a tremor transducer, was mounted on the middle finger and sensed both tremor and the microstructure of the motion. The second, a piezoelectric acceleration transducer, was attached to the control stick where it only sensed the motion of the stick. The bioelectric potentials of the muscles taking part in the motions were registered on two channels to test activity.

The experiments were carried out with the participation of five operators under identical conditions and with identical tasks. Each task lasted 2 minutes, and a total of 11 tasks were executed. The tasks reflect identical and different inertialess, velocity, and inertia control modes based on coordinate axes in the plane of the picture monitor's screen.

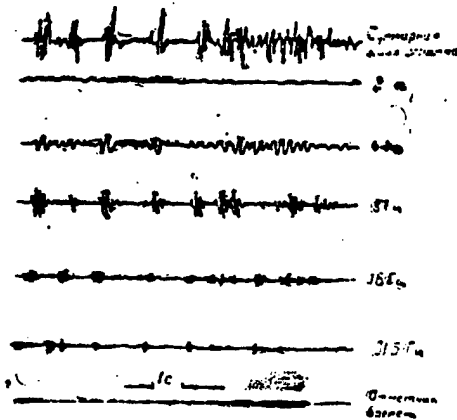


Figure 2.

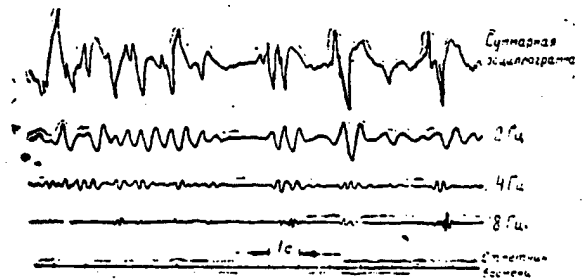


Figure 3.

Figure 2 presents the standard oscillogram from recording the total signals of a tremor and the microstructure of the motion of the wrist, and Figure 3 presents an oscillogram of the motion of the control stick. Oscillograms of the component spectra of each of these, which have been isolated by a third-octave analyzer from the total signals are also presented in the lower parts of these two figures.

The spectral analysis of both signals that is presented shows that a rather wide frequency range band exists for the first of them. The second signal, which corresponds to the control stick (Figure 3), contains comparatively smaller components.

Amplitude-frequency characteristics have been constructed on the basis of a spectral analysis of the registered signals of the random control motions (Figures 4 and 5). The frequency in hertz is plotted on the horizontal axis, and the relative mean amplitude of the component harmonics of the spectrum is plotted on the vertical axis. All amplitudes are measured in one scale. The numbers 1 through five are the numbers of operators.

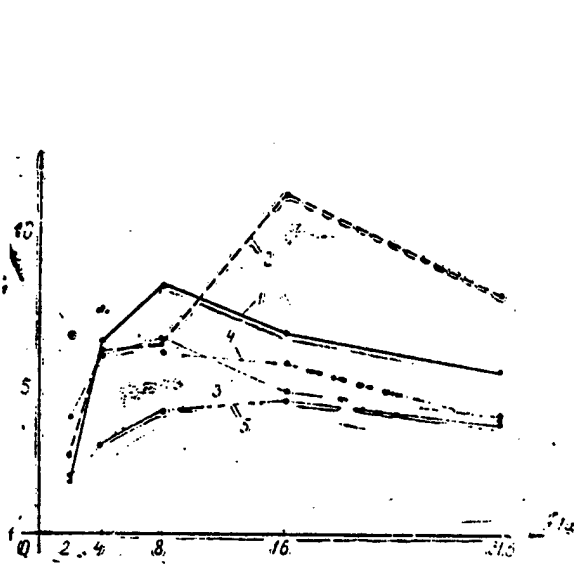


Figure 4.

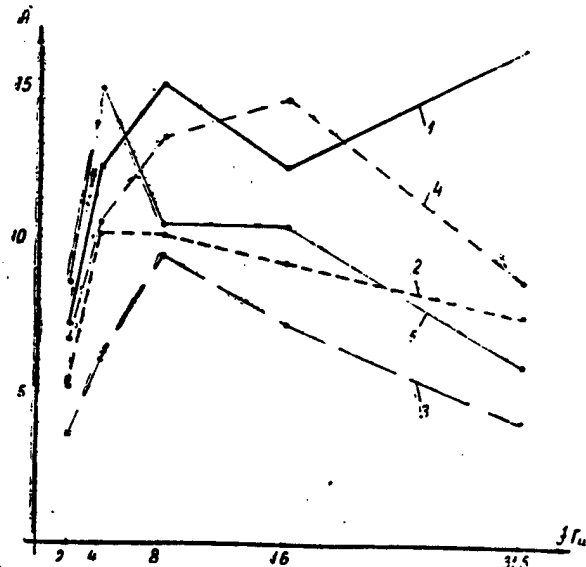


Figure 5.

With respect to the characteristics of the instrument, the lower and upper bounds of the filters in third-octaves embrace the entire frequency range from 2 to 35.5 Hz in an analysis of the signals passed through the spectrum analyzer. The 2- to 35-Hz frequency range corresponds to the practicably perceivable amplitudes of the component harmonics exceeding the error of the instrument.

As is evident from the graphs and is characteristic for all the experiments conducted, an expressed maximum that corresponds to different tertiary frequencies for different operators is observed in the amplitudes of the oscillations for each operator. In addition, depending on the dynamics of the control task being executed, the intensity of the oscillations of the wrist changes as expected, and the maximum of the amplitudes of the harmonics also shifts to one side or the other on the tertiary frequencies. This may be confirmed by comparing the graphs of the amplitude-frequency characteristics, which have been conditionally termed the first and third tasks in Figures 4 and 5.

When the control tasks were being executed, the microstructure of the wrist's motion represents a random process despite the fact that the motion of the target has completely specified constant parameters for the given task. Therefore, a definite spread in the amplitude of the oscillations of the spectrum's components is noted.

Based on a dispersion analysis of these oscillations, it is possible to say that the dispersion has a different value for different harmonics of the

spectrum. Figure 6 shows the distribution of the dispersions in a third of an octave for one of the tasks. An analogous picture may be observed for the other tasks conducted in the program for all the operators.

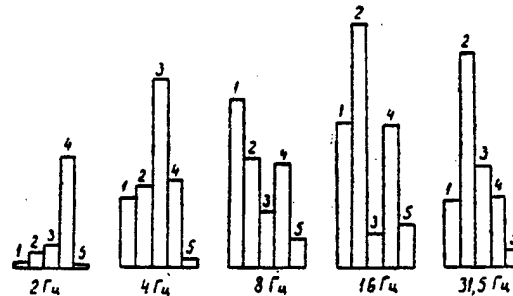


Figure 6.

The experimental studies showed that the activity of an operator executing a control process is accompanied by tremors and microoscillations during any conscious motions. They correspond to a fixed position or a shift of the control stick. In addition, these oscillations embrace a wide frequency spectrum with a changing frequency and amplitude of the harmonics. There is every basis to propose that they depend on the physiological and psychological states of the operator.

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CSO 1840/1295

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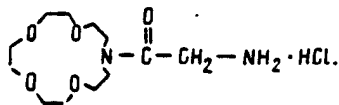
IMMUNOTROPIC PROPERTIES OF MEMBRANE-ACTIVE COMPLEXONE CONTAINING PHARMACOPHORIC FRAGMENT

Kiev DOKLADY AKADEMII NAUK UKRAINSKOY SSR. SERIYA B. GEOLOGICHESKIYE, KHIMICHESKIYE I BIOLOGICHESKIYE NAUKI. in Russian No 8, Aug 86 (manuscript received 29 Dec 85) pp 59-61

[Article by I. E. Britva, T. O. Filippova and N. Ya. Golovenko, Physical-Chemistry Institute of the UkSSR Academy of Sciences, Odessa and the Odessa Institute imeni I. I. Mechnikov, under the "Biology and Medicine" rubric: "Immunotropic Properties of Membrane-Active Complexone Containing a Pharmacophoric Fragment"; presented by Academician of the UkSSR Academy of Sciences A. A. Sozinov]

[Text] The search for immunomodulating substances for medical treatment of immunity disorders is one of the basic tasks of modern immunopharmacology. Some of the preparations having such an action have already been used in the clinic for treatment of primary and secondary immune deficiencies, and also for autonomic diseases [1,2]. The majority of them have deficiencies [3], and, therefore, searches for new immunomodulators are necessary.

Our objective is the study of the immunotropic properties of new synthetic water-soluble compounds of the macroheterocycle class - N-(aminoacetyl)-1-aza-3.7.10.13-tetraoxacyclopentadecane hydrochloride (I) of the formula



As it is evident from the formula, this is a derivative of a membrane-active complexone (aza-15-crown-5) containing a glycine radical as the pharmacophoric fragment.

Experiments were conducted on female mice of the CBA strain weighing 16.20 g. The immunotropic activity I was evaluated by its ability to change the intensity of the immune response to the test-antigen; Sheep erythrocytes were used as the test-antigen.

Both intact and immune-deficient animals were studied, inasmuch as immunostimulating agents affect, as a rule, the defective link of the immune system. In order to create a model of immunodepression, 20-methylcholanthrene (a chemical carcinogen causing the formation of tumors in 100 percent of experimental animals) and cyclophosphane (a cyclostat widely used in oncological and transplant practice) were used in a dose of 50 mg/kg of body weight of the animals. 20-Methylcholanthrene (20-MCh) was administered in 0.1 ml of olive oil subcutaneously for 7 days before immunization; cyclophosphane was administered intraperitoneally, together with the antigen.

The I compound was administered in doses of 15 and 30 mg/kg three times according to the schedule (-1.0, 0, +1) days, in which 0 is the day of immunization ($5 \cdot 10^8$ erythrocytes per mouse intraperitoneally). The results were followed for 5 days after antigen stimulation.

In order to evaluate the humoral reactions in the animals, the hemolytic activity of the serum and splenocytes [4], the number of antibody-forming (AFC) [5] and the rosette-forming [RFC] [6] cells in the spleen, and also the titers of circulating hemagglutinins and hemolysins were determined.

In order to study the effect of I on the cell immune reactions, a model of hypersensitivity of the delayed type (HDT) [7] was used. The animals were sensitized by intraperitoneal administration of 10^7 sheep erythrocytes (day 0), and after 4 days a resolving dose of antigen (10^8 erythrocytes in 40 microliters of physiological solution was administered subcutaneously into the pad of the right foot), and after 24 hours, the intensity of the HDT was followed by the difference in the thickness of the right and left paws. The I compound in this case was administered intraperitoneally in a dose of 30 mg/kg, three times on (+1, +2, +3) days.

The data obtained were treated statistically.

A study of the effect of I on the intensity of the immune response in intact animals showed that in a dose of 30 mg/kg it leads to a proved lowering of the titers of circulating antibodies in the blood (Table). The AFC and RFC number and the hemolytic activity of splenocytes are lowered negligibly. When doses of 15 mg/kg are used, the intensity of the immune response of the mice is suppressed significantly. The RFC number and the hemolytic activity of the spleen cells decreased by a factor of 2, the serum hemolytic activity was lowered (by a factor of 1.8), and the hemagglutinin and hemolysin titers were lowered (by 28 and 32 percent, respectively).

The presence of I in both doses on a background of cyclophosphane leads to partial abolishment of the immunodepressed state. At the same time, a correlation is observed between the increase in the AFC number in the serum and the intensity of the synthesis of antibodies of the splenocytes. These indicators are reduced to their level in the control animals. The hemolytic activity of the serum, the antibody titer, and the amount of RFC, however, are almost unchanged. Apparently, the antibodies synthesizable by the plasmatic cells still do not succeed in entering the blood.

Effect of N-(Aminoacetyl)-1-aza-3.7.10.13-tetraoxacyclopentadecane on the Humoral Immune Reactions of Mice ($M \pm m$, $n=8-10$)

Влияние хлоргидрата N-(аминоацетил)-1-аза-3.7.10.13-тетраоксациклопентадекана на гуморальные иммунные реакции у мышей ($M \pm m$, $n=8-10$)

(1) Вариант	Гемолитическая активность (2)		Число АОК на 10^6 ядерных клеток селезенки (5)	Число РОК на 10^3 ядерных клеток селезенки (6)	Титр циркулирующих (7)	
	сыворотки $\times 10^6$ (3)	спленоцитов $\times 10^6$ (4)			гемагглютининов (8)	гемолизinov (9)
(10) Контроль	26.7 ± 2.6	24.4 ± 1.4	1415 ± 82	66 ± 11	4.7 ± 0.4	5.2 ± 0.2
(11) +15 мг/кг I	$16.0 \pm 2.4^*$	$12.1 \pm 1.7^*$	1305 ± 113	$38 \pm 6^*$	$3.3 \pm 0.4^*$	$3.5 \pm 0.3^*$
+30 мг/кг I	21.8 ± 3.5	22.2 ± 2.7	1254 ± 145	44 ± 6	$3.5 \pm 0.2^*$	$3.8 \pm 0.3^*$
(12) ЦФ	7.1 ± 3.0	11.1 ± 1.9	885 ± 95	35 ± 7	2.0 ± 0.4	2.6 ± 0.6
ЦФ+15 мг/кг I	8.7 ± 2.6	$19.1 \pm 2.2^*$	$1366 \pm 99^*$	37 ± 4	2.4 ± 0.4	2.5 ± 0.2
ЦФ+30 мг/кг I	11.0 ± 2.3	$20.7 \pm 2.3^*$	$1363 \pm 82^*$	39 ± 4	2.3 ± 0.4	2.5 ± 0.4
(13) 20-MX	8.7 ± 1.8	6.7 ± 1.3	1087 ± 170	23 ± 6	3.2 ± 0.6	3.6 ± 0.4
20-MX+15 мг/кг I	6.3 ± 1.3	5.5 ± 1.1	$1612 \pm 122^*$	13 ± 5	1.6 ± 0.5	2.2 ± 0.3
20-MX+30 мг/кг I	8.0 ± 1.4	11.1 ± 2.1	$1712 \pm 190^*$	29 ± 5	2.9 ± 0.4	3.2 ± 0.2

Примечание: Гемолитическую активность сыворотки и спленоцитов выражали количеством эритроцитов барана, лизированных 0.025 мл сыворотки или 10^6 ядерных клеток селезенки. * Достоверность различия по сравнению с показателями у контрольных животных в каждой группе.

Key:

1. Variant
2. Hemolytic activity
3. Of serum 10^6
4. Splenocytes $\times 10^6$
5. AFC number per 10^6 nuclear cells of the spleen
6. RFC number per 10^3 nuclear cells of the spleen
7. Titer of circulating
8. Hemagglutinins
9. Hemolysins
10. Control
11. +15 mg/kg I
12. CPh
13. 20-MCh

Note: The hemolytic activity of the serum and splenocytes was expressed as the number of sheep erythrocytes lysed by 0.025 ml of serum or 10^6 nuclear cells of the spleen. (Footnote *) (The confidence level of the difference in comparison with indicators of the control animals in each group.)

The use of different doses of I on a background of 20-MCh is not accompanied by the abolishing of immunodepression. The majority of indicators remain at the level achieved after introduction of the carcinogen or even lower.

The intensity of the HDT reaction rises by 50 percent (022 ± 003 mm in the control and 034 ± 006 mm in response to the compound being studied). The results obtained give evidence that N-(aminoacetyl)-1-aza-3.7.10.13-tetraoxacyclopentadecane chloride shows a modulating effect on the determined directions of the immune response and can be used for averting immunodepressive states related to the use of cylostats.

SUMMARY. Immunotropic properties of a novel synthetic macroheterocyclic compound. N-(aminoacetyl)-1-aza-3.7.10.13-tetraoxacyclopentadecane chlorohydrate, have been studied.

The above compound results in immunodepression in intact animals. Its administration against the cyclophosphamide background has a stimulating effect on the number of the antibody-forming cells as well as on the degree of their synthesis by splenocytes. The immunostimulating effect of the compound has not been observed on the model of chemical carcinogenesis. Administration of the compound increases the intensity of the lower-type hypersensitivity reaction by 50%.

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12410

CSO: 1840/010

UDC 615.276.2+615.277.3].099:612.017.1+612.017.1.014.46:615.2

PROBLEMS IN IMMUNOTOXICOLOGY

Moscow FARMAKOLOGIYA I TOKSIKOLOGIYA in Russian Vol 49, No 1, Jan-Feb 86,
pp 5-13

[Article by I. Ye. Kovalev and R. G. Azizov, Department of Xenobiology and
Immunochemistry, Scientific Research Institute for Biological Testing of
Chemical Compounds, Kupavna, Moscow Oblast]

[Abstract] Studies on the immunosuppressive potentials of various chemical agents led to the development of the field of immunotoxicology. It now has come to be appreciated that the immune system must be studied in metabolic detail to appreciate the various factors that may influence it and its response to immunostimulants and immunosuppressants. Detailed analysis of the various factors that affect it one way or another led to the discovery that the hepatic cytochrome P-450-dependent monooxygenases may perform a valuable indicator function in assessing the status of the immune system. To date, it appears that all known interferon inducers and immunostimulants inhibit metabolism of xenobiotics and endogenous biomolecules (steroid hormones, cholesterol, thyroxine, prostaglandins, etc.) in the liver via the cytochrome P-450-dependent monooxygenase system. The concept is advanced that biochemical homeostasis is maintained via coupling of the monooxygenase and immune systems, and that imbalance in this relationship leads to immunologic disorders. Further studies in immunotoxicology should concentrate on the dynamics of the various processes in the immune system and status of hepatic monooxygenases, in order to further define the relationship on a more unequivocal basis. Figures 1; references 69: 32 Russian, 37 Western.

12172/12955

CSO: 1840/037

UDC 612.017.1

CORRECTION OF IMMUNE RESPONSE BY MYELOPEPTIDES IN MRL/Mp-lpr/lpr MICE WITH
CONGENITAL AUTOIMMUNE DISORDERS

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 287, No 3, Apr 86
(manuscript received 14 Oct 85) pp 756-759

[Article by R. V. Petrov, academician, U. V. Madzhidov, S. V. Sorokin and
A. A. Mikhaylova, Institute of Immunology, Moscow]

[Abstract] In vivo and in vitro studies were conducted on the antibody response of MRL/Mp-lpr/lpr (MRL/lpr) mice to determine the site of defect in the humoral antibody response. The in vivo data showed that administration of 100 μ g of porcine myelo peptides into the footpad markedly enhanced the antibody response to SRBC in the ipsilateral popliteal lymph nodes in previously immunized mice from 10 ± 2 to 72 ± 12 antibody-forming cells. Similarly, in vitro studies with non-glass-adhering cells also showed stimulation of antibody-forming cells by incubation of porcine bone marrow myelo peptides. These observations suggest that the failure of the MRL/lpr mice to launch an effective humoral antibody response is due to a defect in the mature antibody-forming cells. In all likelihood, differentiation of B cells into mature antibody-forming-cells proceeds in a normal fashion. However, the actual synthesis and/or secretion of the antibody molecules appears to be blocked. Tables 2; references 15: 10 Russian, 5 Western.

12172/12955
CSO: 1840/450

LASER BIOEFFECTS

UDC 615.849.19.03:616.21/.28].036.8+616.21/.28-085.849.19-036.8

PRINCIPLES OF LOW INTENSITY LASER THERAPY BASED ON BIOPHOTOMETRY

Moscow VESTNIK OTORINO-LARINGOLOGII in Russian No 3, May-Jun 86
(manuscript received 18 Nov 85) pp 54-56

[Article by M. T. Aleksandrov, M. Ya. Bezchinskaya, L. A. Klimova, A. R. Yevstigneyev and T. O. Chavchanidze, Department of Otorhinolaryngology, (headed by Prof. N. A. Preobrazhenskiy, academician, USSR Academy of Medical Sciences), and Department of Stomatology, (headed by Prof. N. N. Bazhanov, corresponding member, USSR Academy of Medical Sciences), First Moscow Medical Institute imeni I. M. Sechenov]

[Abstract] Low intensity radiation as generated by a helium-neon laser has been shown to be quite effective in local treatment of pathologic foci, radiation flux density determining the physical results. Radiation may accelerate regenerative processes, inhibit multiplication of microorganisms and improve microcirculation. The particular radiation treatment course prescribed must consider the specific pathology of the patient. For this purpose, biophotometers have been developed, allowing real-time determination of the coefficient of reflection of the tissue of a pathologic focus in order to compute individualized parameters for laser radiation treatments. Photographs are presented of biophotometers for this purpose, plus equations to be used to calculate therapeutic laser radiation exposures. Figures 2; references 8 (Russian).

6508/12955

CSO: 1840/2257

UDC 616.211-002.259-085.849.19

LOW-ENERGY LASER RADIATION IN COMBINED TREATMENT OF OZENA

Moscow VESTNIK OTORINO-LARINGOLOGII in Russian No 3, May-Jun 86
(manuscript received 29 May 85) pp 59-61

[Article by Prof. A. I. Bikbayeva and R. A. Sharipov, Department of
Otorhinolaryngology (headed by Prof. A. I. Bikbayeva), Bashkir Medical
Institute]

[Abstract] A method is described for using helium-neon laser radiation
in the combined treatment of ozena patients. Observations were conducted
on 87 patients, 55 males and 32 females, ranging from 14 to 58 years of
age. Red laser radiation at 620-670 nm was found to have antiinflammatory
vasodilation and analgesic effect on the nasal mucosa. Improvement was
noted in 59 patients. Figures 2; references 17: 12 Russian, 5 Western.

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LASER THERAPY IN OPHTHALMOLOGY

Odessa OFTALMOLOGICHESKIY ZHURNAL in Russian No 8, 1985
(manuscript received 22 Jul 85) pp 451-455

[Article by L. A. Linnik, professor, Odessa Scientific Research Institute of Eye Diseases and Tissue Therapy imeni Academician V. P. Filatov]

[Abstract] A brief survey is presented of the history of laser therapy in ophthalmology, with the notation that the Odessa Institute of Eye Diseases was the first to use this modality in the USSR some 20 years ago. Coagulation therapy represented the initial application of laser in the management of ocular problems. Initially, most of the studies were conducted with ruby laser, with subsequent development of gas argon laser, and more recently krypton-based laser. The usual application of coagulation laser therapy involves treatment and prevention of retinal detachment, treatment of intra-ocular tumors, and various forms of vascular pathology (e.g., diabetic retinopathy). Another step in the use of lasers in ophthalmology is represented by the use of short duration (10^{-12} to 10^{-7} sec) giant pulses for iridophototomy and destruction of secondary membranous cataracts. Despite the development of YAG laser, this modality has found limited acceptance. More recent developments involve the use of the stimulating effects of lasers in promoting tissue regeneration, largely by lasers emitting in the red band. Enhancement of various biosynthetic processes has been documented in the retina, cornea and other ocular tissues, and therapeutic effects have been seen in traumatic and dystrophic conditions. References 33: 30 Russian, 3 Western.

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UDC 617.713-002+617.7-007.681-085.849.19

SELECTION OF LASER FOR TREATMENT OF ANTERIOR EYE SEGMENT AND EYELIDS

Odessa OFTALMOLOGICHESKIY ZHURNAL in Russian No 8, 1985
(manuscript received 8 Jul 85) pp 455-459

[Article by V. V. Volkov, professor and honored activist of science of the RSFSR, L. I. Balashevich and A. F. Gatsu, candidates of medical sciences, Ya. L. Kulakov, physician, and P. S. Avdeyev and Yu. D. Berezin, engineers, Leningrad]

[Abstract] An evaluation was conducted on the laser modality employed in the treatment of 700 cases with herpetic and ulcerative keratitis, corneal epithelial and endothelial dystrophy, primary and secondary closed-angle glaucoma, secondary cataracts, eyelid neoplasia, etc. In 80% of the cases the management was ambulatory, with a follow-up period lasting from 6 months to 8 years. Various lasers commonly employed in ophthalmological practice were utilized in different modalities, and provided a basis for their assessment. The use of the blue-green light of an argon laser in photocoagulation was found effective in pupillary dislocation and destruction of pigmented neoplasia of eyelids and the lacrimal caruncle. The infrared emission of Yb-Er laser was particularly useful in treating inflammatory and dystrophic lesions on the cornea, massive neovascularization of cornea, and in treating poorly pigmented eyelid neoplasias. Single pulses of Nd laser (infrared) were especially effective in closed angle glaucoma, pupillary occlusions, and secondary cataracts. Tumors of the iris were best managed with a combination of argon and Nd laser irradiation. Figures 1; references 6: 3 Russian, 3 Western.

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USE OF QUANTUM GENERATOR EMISSIONS IN SELECTED CORNEAL DISEASES

Odessa OFTALMOLOGICHESKIY ZHURNAL in Russian No 8, 1985
(manuscript received 10 Jul 85) pp 459-463

[Article by Ye. S. Libman, professor, R. A. Tolmachev, I. V. Glazko and Yu. I. Kiyko, candidates of medical sciences, S. V. Ivanov, senior engineer, Yu. L. Tverskoy, candidate of technical sciences, and V. I. Glazko, physician, Central Order of the Red Banner of Labor Scientific Research Institute of Work Fitness Expertise and Occupational Service for Invalids; Moscow Center for Visual Rehabilitation of Invalids]

[Abstract] Therapeutic trials were conducted with various quantum generators for the treatment of 383 patients (444 eyes) with inflammatory, dystrophic and post-traumatic conditions of the cornea. Of the various laser modalities tested (ruby, argon, ytterbium-erbium, helium-neon) the ytterbium-erbium laser was shown to be most effective in correcting corneal pathology. On the whole, clinical improvements was obtained in 92.3% of the cases. In 89.7% of the patients central vision improved, and hospital stays were reduced to 17.3 days versus 24.9 days for control (laser untreated) patients ($P < 0.05$). Figures 1; references 28: 20 Russian, 1 Polish, 7 Western.

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CLINICAL AND MORPHOLOGICAL ASPECTS OF HELIUM-NEON LASER TREATMENT OF SECONDARY
ENDOTHELIAL-EPITHELIAL DYSTROPHY OF CORNEA

Odessa OFTALMOLOGICHESKIY ZHURNAL in Russian No 8, 1985
(manuscript received 6 Aug 85) pp 463-467

[Article by A. D. Semenov, L. V. Sums kaya, T. I. Ronkina, D. A. Magaramov
and V. Ya. Kishkina, candidates of medical sciences, Moscow Scientific Re-
search Institute of Eye Microsurgery, RSFSR Ministry of Health]

[Abstract] Clinical trials were conducted on 92 patients with secondary endothelial-epithelial corneal dystrophy, using combined therapy consisting of helium-neon low intensity laser stimulation and conventional chemotherapy (corticosteroids, edema-controlling agents, vitamins, desensitizers, etc.). Patients on the combined therapy did much better than patients limited to drug therapy, pointing to the importance of the laser modality (100 $\mu\text{W}/\text{cm}^2$, 5 min/treatment, alternate days, 6 treatments total). The patients on combined therapy presented with recovery of endothelial patency and structural normalization, whereas the area of the lesion remained 2- to 7-fold greater in the patients limited to chemotherapy. Combined therapy promoted recovery of corneal transparency at a rate 2- to 3-greater than in the control group, and an improvement in visual acuity from 0.26 ± 0.04 to 0.5 ± 0.01 (with virtually no improvements in the control patients). Furthermore, 76% of the patients on the combined therapy showed an arrest of the pathologic process for 5-6 months, while chemotherapy alone induced a remission of only a month's duration. References 15: 10 Russian, 5 Western.

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SEQUENTIAL COMBINED LASER THERAPY FOR LONG-STANDING, NONHEALING CORNEAL DEFECTS

Odessa OFTALMOLOGICHESKIY ZHURNAL in Russian No 8, 1985
(manuscript received 19 Jun 85) pp 467-470

[Article by P. P. Chechin, candidate of medical sciences, Odessa Scientific Research Institute of Eye Diseases and Tissue Therapy imeni V. P. Filatov]

[Abstract] A combined laser therapy was tested on 38 patients (38 eyes) with corneal burns, that had been previously shown effective in the treatment of experimental corneal lesions in rabbits. The patients were initially treated with an argon laser (300-600 mW/cm², 5 mm field of illumination, 0.1 sec exposure), followed in 24 h with a defocused helium-neon laser (0.1 mW/cm², 3 min exposure over the entire lesion). The helium-neon laser treatment was repeated within 24 h if indicated. After 6-8 sessions epithelialization of the cornea was apparent. Regression of neovascularization was observed in 9 of the cases, with abatement of iridocyclitis in affected cases. In addition to improvements in visual acuity, the combined laser therapy was found to be effective in preventing thinning of the cornea and corneal perforation. In general, the therapy was effective in promoting repair and healing and this approach can be recommended for further investigation. Figures 1; references 11: 9 Russian, 2 Western.

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LASER THERAPY OF CORNEAL DISEASES

Odessa OFTALMOLOGICHESKIY ZHURNAL in Russian No 8, 1985
(manuscript received 23 May 85) pp 470-472

[Article by A. V. Bolshunov, senior scientist, N. V. Yermakov, junior scientist, A. A. Kasparov, professor, and V. A. Oganesyants, junior scientist, All-Union Scientific Research Institute of Eye Diseases, USSR Ministry of Health]

[Abstract] An analysis was conducted on 984 case studies (910 eyes) dealing with laser therapy of corneal pathology, to assess the different therapeutic modalities vis-a-vis a specific type of disorder. The data demonstrated that argon lasers were definitely the optimal approach to the management of bacterial and herpetic corneal ulceration. The effectiveness was apparently due to high temperature peaks (ca. 100°C) induced in the tissue, which were lethal to the etiologic agents. Argon laser therapy was also effective in controlling neovascularization in the cornea as a result of photocoagulation. Stage I and II bullous endothelial-epithelial dystrophic changes in the cornea were best treated by helium-neon laser radiation, while stage III and IV conditions were arrested by carbon dioxide laser therapy. On the whole, the various modes of laser therapy were found to be quite effective in the treatment of a variety of corneal conditions. References 15 (Russian).

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USE OF LTM-01 HELIUM-NEON LASER IN TREATMENT OF ANTERIOR EYE SEGMENT
PATHOLOGY

Odessa OFTALMOLOGICHESKIY ZHURNAL in Russian No 8, 1985
(manuscript received 12 Feb 85) pp 473-474

[Article by O. B. Chentsova, professor, G. L. Ukhaneva, V. P. Mozherenkov
and L. N. Kharchenko, candidates of medical sciences, Moscow Oblast Order
of the Red Banner of Labor Scientific Research Clinical Institute imeni
M. F. Vladimirskiy]

[Abstract] Trials were conducted with a low-intensity dental LTM-01 helium-
neon laser in the management of 47 patients with a variety of corneal lesions
(penetrating and nonpenetrating wounds, ulceration, burns, and post-traumatic
and postsurgical hyphemas). The data demonstrated that 6-10 sessions of
the low intensity therapy ($0.05-0.1 \text{ mW/cm}^2$ with a defocused beam for 1-3
min from a distance of 20 cm) was effective in all cases in accelerating
healing and minimizing serious complications. The low weight and small
dimensions of the LTM-01 apparatus render it a valuable instrument, with
easy application in ambulatory ophthalmology. References 7 (Russian).

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OCULAR HYPOTENSION FOLLOWING ARGON LASER TRABECULOSPASIS IN TREATMENT OF
OPEN-ANGLE GLAUCOMA

Odessa OFTALMOLOGICHESKIY ZHURNAL in Russian No 8, 1985
(manuscript received 22 Jul 85) pp 474-476

[Article by I. B. Chokova, candidate of medical sciences, Odessa Scientific
Research Institute of Eye Diseases and Tissue Therapy imeni Academician
V. P. Filatov]

[Abstract] Details are presented on the development of a laser technique for the treatment of open-angle glaucoma, consisting of coagulation of the scleral spur and Schwalbe's rings (trabeculospasis) by argon laser. The therapy was tested in the case of 210 patients (229 eyes) with various stages of uncompensated open-angle glaucoma. The laser modality consisted of a 400-600 mW output to a 50 μ m target site for 0.1-0.2 sec, with 50-100 coagulation sites in the lower half of the eye at distances of 150-200 μ . Laser trabeculospasis was found effective in reducing ocular pressure in 79% of the patients with fully established glaucoma, in 76% of the patients in the initial stages, and in 24% of the patients with advanced open-angle glaucoma, as seen in follow-ups ranging to 7 years. The usual reduction in pressure was on the order of 16.5 mm Hg, but in individual patients with advanced glaucoma reductions of 20-25 mm Hg were observed. In the patients followed for 7 years essentially normal pressure was maintained in the case of 9 eyes without miotics, whereas 45 required minimal drug assistance. These observations provide positive confirmation of the effectiveness of trabeculospasis in assuring long-term intraocular normotension. References 2 (Russian).

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TRANSSCLERAL LASER COAGULATION OF CILIARY BODY IN ABSOLUTE GLAUCOMA

Odessa OFTALMOLOGICHESKIY ZHURNAL in Russian No 8, 1985
(manuscript received 21 Feb 85) pp 477-479

[Article by N. N. Aleksandrova, aspirant, and P. I. Saprykin, professor,
Chair of Eye Diseases, Saratov Order of the Red Banner of Labor Medical
Institute]

[Abstract] Following a chance observation on rabbits that krypton laser irradiation of the ciliary body led to intraocular hypotension, trials were conducted on 30 patients (9 to 76 years of age) with absolute glaucoma to determine whether this modality had a place in their management. Treatment consisted of transscleral ciliary body irradiation with a krypton laser beam ($0.647 \mu\text{m}$, $0.95\text{--}1.16 \text{ W}$, focused to $1000\text{--}1500 \mu\text{m}$ diameter spot) applied for $0.6\text{--}1.0 \text{ sec}$ parallel to the limbus at a distance of $3\text{--}4 \text{ mm}$. A total of $20\text{--}45$ irradiations were performed per session, for a total of 1 to 3 sessions at 2 to 4 day intervals. The initial response consisted of reactive hypertension, raising the average ophthalmotonus for the group from $35.0 \pm 1.21 \text{ mm Hg}$ to $39.33 \pm 1.06 \text{ mm Hg}$ within the 6 to 24 h post-irradiation period. By 48 h the intraocular pressure had returned to background level, and then dropped to $27.1 \pm 1.8 \text{ mm Hg}$ over the next 6-7 days. Over the next 9 months intraocular pressure continued to increase; however, 28 of the patients were pain free or had sustained considerable relief. The effectiveness of the krypton laser in alleviating pain was apparently due to both diminished formation and increased outflow of the aqueous humor. References 10: 5 Russian, 5 Western.

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EFFECTIVENESS OF LASER TRABECULOPLASTY IN OPEN-ANGLE GLAUCOMA

Odessa OFTALMOLOGICHESKIY ZHURNAL in Russian No 8, 1985
(manuscript received 11 Apr 85) pp 479-481

[Article by A. S. Smelovskiy, professor, M. N. Boykova, candidate of medical sciences, and Ye. I. Smirnova and A. V. Smirnova, physicians, Chair of Eye Diseases, Kalinin Medical Institute]

[Abstract] An evaluation was conducted on the efficacy of argon laser trabeculoplasty in the management of open-angle glaucoma in 190 male and female patients (201 eyes), ranging in age from 44 to 85 years. The procedure was conducted under epibulbar anesthesia, using a 50 μ m diameter beam with a power output of 0.5 to 1.0 W and an exposure time of 0.1 to 0.5 sec (ca. 100 irradiations/session, 1-3 sessions at 2-3 day intervals). One to 2.5 year follow-up studies demonstrated the efficacy of this approach to open-angle glaucoma, as indicated by intraocular normotension in 72.4% of the cases and visual stabilization in 86.7%. Argon laser trabeculoplasty appears to be an attractive alternative to microsurgery which facilitates normotension as a result of increased outflow of the aqueous humor. References 11: 8 Russian, 3 Western.

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COMPARATIVE ASSESSMENT OF CONVENTIONAL AND LASER SURGERY IN FAR ADVANCED
UNCOMPENSATED OPEN-ANGLE GLAUCOMA

Odessa OFTALMOLOGICHESKIY ZHURNAL in Russian No 8, 1985
(manuscript received 15 Nov 84) pp 481-484

[Article by N. G. Mamedov, candidate of medical sciences, and A. L. Shtilerman and G. Shayya, aspirants, Special Problems Scientific Research Laboratory of Ocular Microsurgery, Chair of Eye Diseases, 2nd Moscow Order of Lenin State Medical Institute imeni N. I. Pirogov]

[Abstract] Treatment protocols for several hundred cases were reviewed to assess the relative efficacy of laser and conventional microsurgery in the treatment of advanced cases of open-angle glaucoma. Trabeculoplasty was found to be effective in 40% of the cases, and trabeculospasis in 30.2%. In addition, in 122 eyes in which trabeculoplasty failed to result in normotension a follow-up with trabeculospasis resulted in normotension in 37 eyes (30.3%), bringing the overall effectiveness of laser surgery to 50.3%. Conventional microsurgery alone was effective in 95.7% of the cases in bringing about normotension, but was accompanied by a complication rate of 34.2%. A similar follow-up (24-30 months) showed that a lower incidence of complications (26.5%) was seen in uncompensated cases subjected to laser + conventional therapy, while the incidence of complications in cases with moderate hypertension subjected to the combined laser + conventional approach was 9.8%. With laser therapy alone the incidence of complications was negligible. In all cases laser treatment assured better vision retention and did not constitute a contraindication for subsequent conventional microsurgical intervention. References 12: 11 Russian, 1 Western.

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MEDICINE

UDC 579.8.088.3:543.545

KEF-1 ELECTROPHORETIC CONCENTRATOR FOR CONCENTRATION OF MICROORGANISMS

Moscow LABORATORNOYE DELO in Russian No 7, Jul 85
(manuscript received 18 Apr 84) pp 440-441

[Article by L. A. Marchenko, M. O. Birger, A. A. Antonov and A. V. Bashtanov,
All-Union Scientific Research and Design Institute of Medical Laboratory
Equipment, Leningrad]

[Abstract] Electrophoresis in a volume of liquid is among the most promising methods for concentrating bacteria. This is the principle used in the KEF-1 concentrator, designed for concentration of bacteria, cells, proteins including enzymes, nucleic acids and other molecules in various volumes of liquid from 10 to 100 ml on a semipermeable membrane and in an accumulating chamber. A photograph of the device is presented. The KEF-1 was used to study the possibility of concentrating salmonella from experimentally-infected water. A concentration factor of 4-5 was achieved. The device was also used to concentrate other microorganisms successfully. The device is said to be similar to the ISCO model 1750 electrophoretic sample concentrator, except that it can be used for microorganisms.

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EFFECT OF LITHIUM HYDROXYBUTYRATE ON VIABILITY OF PRESERVED DONOR KIDNEY

Moscow FARMAKOLOGIYA I TOKSIKOLOGIYA in Russian Vol 49, No 3, May-Jun 86
(manuscript received 7 Mar 85) pp 69-70

[Article by V. M. Sholokhov, Kh. Kh. Babaniyazov, Ye. V. Kizhayev,
B. I. Lyubimov, N. N. Samoylov, G. V. Yudin and G. A. Yeremin, Medical
Service, Military Engineering Order of Lenin Red Banner Academy imeni
V. V. Kuybyshev]

[Abstract] Autotransplantation studies were conducted on dogs to assess the effectiveness of lithium hydroxybutyrate as a substitute for the corresponding sodium salt in the preservation of donor kidneys. Prior to autotransplantation, the kidneys were maintained at 0°C for 24-26 h in Shchumakov's solution with either the sodium or the lithium salt. In the control dogs (autotransplantation + removal of intact kidney) the average survival time was 9.8 ± 5.2 days, with 3 animals dying of renal insufficiency and serum creatinine levels approaching 5.02-7.32 mg% (from 1.60 mg%). Two of the animals in the sodium hydroxybutyrate group died of intestinal invagination. In the experimental (lithium) group 2 animals succumbed by the 5th day due to intestinal invagination, while 3 survived for a month in a clinically satisfactory state. The latter animals were sacrificed after a month, with autopsy showing that the retransplanted kidneys retained full viability. These observations indicate that lithium hydroxybutyrate may be an effective agent in ensuring viability of donor organs. References 6: 5 Russian, 1 Western.

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CSO: 1840/041

MICROBIOLOGY

UDC 576.8.06:575

MOLECULAR-GENETIC MECHANISMS OF ANTIGEN VARIABILITY IN MICROORGANISMS

Moscow USPEKHI SOVREMENNOY BIOLOGII in Russian Vol 101, No 2, Mar-Apr 86,
pp 163-173

[Article by V. V. Tets and L. B. Borisov, First Leningrad Medical Institute
imeni I. P. Pavlov, USSR Ministry of Health]

[Abstract] The study of the antigen variability of microorganisms is an important area of research. Changes in antigen structure occur with varying frequency, new antigen variants arising comparatively rarely. This article studies the role of molecular-genetic mechanisms in antigen structure variability of pathogenic microorganisms. The role of recombination in antigen variability is discussed, as well as the influence of nonchromosomal factors in antigen variability of microorganisms. The material presented illuminates the relationship of mechanisms of antigen variation and the ecology of pathogenic microorganisms. There are three groups among antigen variability mechanisms: spontaneous mutagenesis and recombination among microbes; intra-genome restructuring, supporting long-term successive changes in antigen properties of microorganisms during a single infectious process; and mechanisms related to the influence of nonchromosomal factors and induced mutagenesis, including processes similar to SOS repair. References 100: 28 Russian, 72 Western.

6508/12955
CSO: 1840/2251

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IMMUNOMODULATORS OF MICROBIAL ORIGIN AND RAPID TUMOR GROWTH

Moscow USPEKHI SOVREMENNOY BIOLOGII in Russian Vol 101, No 2, Mar-Apr 86,
pp 228-236

[Article by D. G. Zatula, G. S. Lisovenko and T. A. Syadro, Institute of
Problems of Oncology imeni R. Ye. Kavetskiy, UkSSR Academy of Sciences,
Kiev]

[Abstract] Experimental data have been obtained indicating that microbial immunomodulators under certain conditions may significantly weaken antitumor resistance, facilitating rapid tumor growth. This article analyzes these data. BCG, frequently used in systemic adjuvant therapy for selective stimulation of cellular immunity to increase the antitumor response, has been implicated in increased tumor growth speed. *Corynebacterium parvum* has also been observed to stimulate tumor growth. *Bacillus megaterium* H has been observed to stimulate blastomogenesis as well. The results indicate that the use of individual microorganisms as nonspecific adjuvants to increase antitumor resistance may under certain circumstances stimulate the growth of transplanted tumors or stimulate blastomogenesis by viruses and chemical carcinogens. Many of these microorganisms have cross-reacting antigens with animal and human malignant tumor cells, the biological sense and significance of which are not yet known. Therefore, in spite of the fact that these microorganisms are powerful reticuloendothelial system adjuvants, serious doubts arise concerning the expediency of their use in clinical oncology. References 92: 21 Russian, 71 Western.

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MECHANISMS OF DEVELOPMENT OF BOTULINIC PARALYTIC SYNDROME

Moscow USPEKHI SOVREMENNOY BIOLOGII in Russian Vol 101, No 2, Mar-Apr 86,
pp 306-320

[Article by N. P. Chesnokova, Saratov State Medical Institute, RSFSR Ministry
of Health]

[Abstract] Botulism toxin is a classic neurotropic poison which suppresses the liberation of acetylcholine in the peripheral, autonomic and central nervous system. Most researchers indicate the toxin has its primary pathogenic effect on the area of the presynaptic terminals, blocking the conduct of pulses from nerve to muscle. The concept of the peripheral action of the toxin on the area of presynaptic terminals is discussed, as are the pathogenic effect of the toxin on special phasic motoneurons and cholinergic synapses of the central nervous system and possible mechanisms of the inhibiting influence of the toxin on free acetylcholine in the synapses. This review of the data published in this area over the past 40 years demonstrates that the locus of specific bonding of all types of botulism toxin is the area of the presynaptic terminals of the cholinergic myoneural synapses, with trisialogangliosides acting as toxin neuroreceptors. Further detailed studies of the structure of the neuroreceptors, plus studies of the status of transport Ca-ATPase of the synaptosomes, establishment of the interrelationship of disorders in electrolyte balance in the presynaptic terminals and the contracting capability of actomyosin-like proteins in the nerve endings are required to refine existing concepts of the pathogenesis of the botulism toxin. References 126: 47 Russian, 79 Western.

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CSO: 1840/2251

UDC 577.3:576.8:582.28:582.288

GROWTH KINETICS OF MYCELIAL COLONY

Kiev DOKLADY AKADEMII NAUK UKRAINSKOY SSR. SERIYA B: GEOLOGICHESKIYE, KHIMCHESKIYE I BIOLOGICHESKIYE NAUKI in Russian No 7, Jul 86
(manuscript received 27 Feb 86) pp 80-83

[Article by V. N. Kotov, Institute of Botany, UkSSR Academy of Sciences, Kiev]

[Abstract] A model was developed for mycelial growth based on primary mechanisms of colony formation: apical growth and lateral branching. Actually, this model is a special time-continuous branching process with three types of cells: apical cells, internal hyphal cells which give rise to side hyphas and the nondivisible internal hyphal cells. Asymptotically, average quantities of these cells were shown to grow exponentially. The hyphal growth unit tended to remain constant (HGU = relationship of total hyphas length to the number of apexes in the colony). For the case where hyphal cell division had a gamma-distribution, HGV could be related to Maltusov index. Figure 1; references 9: 1 Russian, 8 Western.

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PHARMACOLOGY AND TOXICOLOGY

UDC 577.35.26+615.919+591.145.3

CHANGE IN SURFACE CHARGE OF MEMBRANES AND POTENTIATION OF PHOSPHOLIPASE
A₂ UNDER INFLUENCE OF CYTOTOXIN FROM CENTRAL ASIAN COBRA VENOM

Moscow BIOLOGICHESKIYE NAUKI in Russian No 3, Mar 85
(manuscript received 4 Jul 84) pp 24-27

[Article by O. V. Krasilnikov, L. Ya. Yukelson and B. A. Tashmukhamedov,
Institute of Biochemistry, Uzbek SSR Academy of Sciences]

[Abstract] A study was made of the significance of the basis cytotoxin molecular properties in the mechanism of potentiation. Pure preparations of cytotoxin and phospholipase A₂ were extracted from central Asian cobra venom. The hemolytic effect was evaluated using 50% suspensions of washed human erythrocytes in isotonic solutions. The results show that cytotoxin stimulates the process of bonding of acid proteins on an artificial phospholipid membrane. This indicates that cytotoxin facilitates the interaction of acid phospholipase A with the membrane. The results of the study prove the capability of cytotoxin to potentiate bonding of acid phospholipase A₂ with the negatively charged surface of the membrane. Figures 3; references 12: 5 Russian, 7 Western.

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CSO: 1840/2264

UDC 617-089.583.29+615.214.2]-092:612.55

EFFECTS OF NEUROLEPTICS ON THERMOREGULATION IN NORMO- AND HYPO-THERMIA

Moscow FARMAKOLOGIYA I TOKSIKOLOGIYA in Russian Vol 49, No 3, May-Jun 86
(manuscript received 20 Mar 85) pp 23-27

[Article by N. O. Bazhanov and V. N. Salyayev, professor, Chair of Pharmacology, Yaroslavl Medical Institute]

[Abstract] Outbred male rats were employed in a study designed to elucidate the effects of neuroleptics on thermoregulatory mechanisms in normo- and hypothermia, the latter induced by immersion of the animals in water at 7°C. Under normothermic conditions chlorpromazine led to a significant reduction in body temperature, and in hypothermia delayed onset of light (33°C rectal) and moderate (26°) hypothermia. Reserpine exerted a hyperthermic effect in normothermic rats, and in the hypothermic experiments accelerated the onset of light (33°C), moderate (26°C) and deep (19°C) hypothermia. Furthermore, haloperidol and droperidol had no effect on thermoregulation in normo- and hypothermic animals. These observations were interpreted to indicate that, in normothermia, thermoregulatory activity was largely due to the firmly-bound, inert in the functional sense, cerebral epinephrine. In hypothermic animals, however, thermoregulatory activity was exerted by the labile, functionally active, epinephrine fraction. References 12: 8 Russian, 4 Western.

12172/12955
CSO: 1840/041

UDC 615.214.7:[547.943:547.95].036.8:616-001.36-092

EFFECTS OF SYNTHETIC ANALOGS OF ENKEPHALIN, MORPHINE AND THEIR ANTAGONISTS
ON EXPERIMENTAL TRAUMATIC SHOCK

Moscow FARMAKOLOGIYA I TOKSIKOLOGIYA in Russian Vol 49, No 3, May-Jun 86
(manuscript received 7 Sep 84) pp 103-107

[Article by V. G. Motin and V. V. Yasnetsov, Scientific Research Institute
of Normal Physiology imeni P. K. Anokhin, USSR Academy of Medical Sciences,
Moscow]

[Abstract] Chinchilla rabbits were employed in a study on the effects of morphine and enkephalin analogs (Tyr-D-Ala-Gly-Phe(NO₂)-NH₂, FK-33-824, Tyr-D-Ala-Gly-MePhe-Met-(O)-ol) and their antagonists (naloxone, nalorphine, TRF) on the clinical status of animals with trauma induced by the Cannon method. All agents were administered i.v., with concomitant monitoring of various physiological parameters (BP, heart rate, respiratory rate, pain threshold). Studies on the traumatized animals for 2 to 2.5 h demonstrated that administration of morphine or the enkephalin analogs had a positive effect of the clinical course. Administration of the antagonists and TRF had an adverse effect on the rabbits, characterized by deterioration of the vital signs. The generalized data were, therefore, consistent with the view that endogenous opioids play a protective role in traumatic shock. References 17: 6 Russian, 11 Western.

12172/12955
CSO: 1840/041

UDC 612.822.013.7.014.46

DRUG EFFECTS ON ENERGY STATUS OF BRAIN STRUCTURES

Moscow FARMAKOLOGIYA I TOKSIKOLOGIYA in Russian Vol 49, No 3, May-Jun 86, pp 115-119

[Article by V. I. Arkhipov and A. Yu. Bulantsev, Laboratory of Synaptic Structure and Function, Institute of Biological Physics, USSR Academy of Sciences, Moscow]

[Abstract] Largely Western data are reviewed on the use of ^{14}C -2-deoxy-glucose uptake by brain formations following drug administration in the rat to localize sites of drug action. To date it is clear that certain agents, such as the barbiturates, have a generalized effect on the brain and diminish the energy status of all formations to a more or less equal extent. Others may selectively enhance (physostigmin) or diminish (scopolamine) glucose uptake in the various formations. Still other agents (apomorphine, haloperidol) enhance glucose uptake in some structures and diminish uptake in others. The initial response of a given brain formation represents the initial site of action of a drug, which then spreads to anatomically and functionally connected neurons and formations that are dependent on the functional status of the primary site. As a result, the metabolic consequences of drug administration spread in the brain tissue, and lead to the theoretical assumption that a strictly specific pharmacologic attack at a given neuronal target system with an inherent neurotransmitter system is impossible. References 40: 5 Russian, 35 Western.

12172/12955
CSO: 1840/041

UDC 615.281.8.015.4:578.825.11].07

ANTIVIRAL ACTIVITY OF BONAFTON AND ACYCLOVIR AGAINST HERPES SIMPLEX VIRUS
TYPES 1 AND 2

Moscow KHIMIKO-FARMATSEVTICHESKIY ZHURNAL in Russian Vol 20, No 2, Feb 86
(manuscript received 22 Mar 85) pp 228-232

[Article by A. N. Fomina, I. S. Nikolayeva, T. V. Pushkina, T. K. Mazanko
and F. P. Filatov, All-Union Scientific Research Institute of Pharmaceutical
Chemistry imeni S. Ordzhonikidze; Institute of Virology imeni D. I. Ivanovskiy,
Moscow]

[Abstract] A comparative analysis was conducted on the antiviral effectiveness of two synthetic antivirals -- bonafton (from the Ordzhonikidze Institute, USSR) and acyclovir (Zovirax, Wellcome, Great Britain) -- against several strains of herpes simplex virus types 1 and 2. In vitro studies on inhibition of plaque formation in Vero and chick embryo fibroblast cultures the agents were effective in concentrations of 0.625-2.5 µg/ml for bonafton, and 0.312-0.625 µg/ml for acyclovir in giving 50% inhibition. Acyclovir was less effective as an antiviral in the chick cells than in the Vero cultures. When administered per os to albino mice with a generalized herpetic infection (1000 LD₅₀ dose of a strain L₂ type 1 virus) in a concentration of 100 mg/kg b.i.d. for 5 days both agents reduced mortality by 40%. These studies demonstrated that both antivirals are effective against herpes simplex virus, including the fact that bonafton is also effective against type 2 viruses. References 9: 4 Russian, 5 Western.

12172/12955
CSO: 1840/047

UDC 615.214.22.07

DOSE-RESPONSE EVALUATION OF ANXIOLYTIC AND NOOTROPIC EFFECTS OF POTASSIUM OROTATE

Moscow FARMAKOLOGIYA I TOKSIKOLOGIYA in Russian Vol 49, No 1, Jan-Feb 86
(manuscript received 24 Apr 84) pp 14-16

[Article by N. N. Karkishchenko and M. I. Khaytin, Rostov-on-Don Medical Institute]

[Abstract] A dose-response study was conducted on the anxiolytic and nootropic effects of potassium orotate, using outbred, albino rats as the target species and a dose range of 5 to 100 mg/kg for 30 days. Evaluation of the conditioned avoidance behavior and tranquilizing effects demonstrated that in both cases maximum desirable effects were obtained with a dose of 20 mg/kg. Although doses as low as 5 mg/kg had some stimulatory effect on the acquisition of conditioned behavior, that dose was ineffective as a tranquilizer. Similarly, in terms of the parameters under evaluation, doses of potassium orotate in excess of 20 mg/kg had adverse effects or were ineffective on the dose-response curve. The fact that in both situations a single dose yielded optimum results points to the need for further definition of the pharmacodynamics of potassium orotate and endogenous pyrimidine analogs. Such information from an animal model could provide the basis for eventual therapeutic trials dealing with correction of neurotic disorders accompanied by memory and learning disabilities. Figures 1; references 8 (Russian).

12172/12955
CSO: 1840/037

UDC 615.357:577.175.829].015.4:616.89-008.447].076.9

SPECIES-RELATED BEHAVIORAL EFFECTS OF THYROTROPIN-RELEASING FACTOR (TRF)

Moscow FARMAKOLOGIYA I TOKSIKOLOGIYA in Russian Vol 49, No 1, Jan-Feb 86
(manuscript received 9 Apr 84) pp 30-33

[Article by S. S. Krylov, A. N. Petrov, S. S. Losev, Ye. K. Georgianova,
A. V. Lychakov and M. K. Shevchuk, Department of Psychopharmacology, Institute
of Toxicology, USSR Ministry of Health, Leningrad]

[Abstract] Studies were conducted on mice, rats, dogs and monkeys to assess the behavioral effects of TRF administration into the cisterna magna (50-100 µg) or i.p. (1-100 mg/kg). Evaluation of the behavioral effects demonstrated that mice and rats responded with an increased frequency of grooming and sniffing activity. Dogs reacted with frequent yawning, scratching and sniffing, while monkeys responded with frequent shaking and chewing activity. These forms of stereotypic reactions elicited by exogenous TRF demonstrate the need for more preclinical studies on the full range of effects attendant to the administration of TRF, its analogs, and other peptides falling into the releasing-factor class. References 18: 3 Russian, 15 Western.

12172/12955

CSO: 1840/037

EXPERIMENTAL TESTS FOR DETECTION OF ADDICTIVE AGENTS

Moscow FARMAKOLOGIYA I TOKSIKOLOGIYA in Russian Vol 49, No 1, Jan-Feb 86
(manuscript received 7 Jun 84) pp 87-92

[Article by N. K. Barkov, Laboratory of Narcotics Pharmacology, All-Union Scientific Research Institute of General and Forensic Psychiatry imeni V. P. Serbskiy, Moscow]

[Abstract] Largely Western literature is reviewed on the various experimental methods used to assess the additive potential of various chemical agents. The methods included both ad libitum intake and injections, as well as methods for monitoring intake dynamics under various conditions, and evaluation of sex differences in predisposition to addiction. Metabolic detoxication and antibody inducement are considered as key factors in the problem of addiction and its severity, as well as the use of substances that react with the target receptors. On this basis, techniques have been developed that allow addictive assessment of drugs, barbiturates, alcohol, tranquilizers, analgesics, hallucinogens and psychostimulants on experimental animals. Such methodology allows preclinical evaluation of chemotherapeutic agents for addictive potential, and design of optimal methods for the prevention of addiction and/or its treatment. References 39: 12 Russian, 27 Western.

12172/12955
CSO: 1840/037

EXTRACELLULAR CONCENTRATION OF CALMODULIN INHIBITORS MODULATES STIMULATION
OR INHIBITION OF CALCIUM CURRENTS IN SNAIL NEURONS

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 287, No 2, Mar 86
(manuscript received 10 Jun 85) pp 473-476

[Article by A. Ye. Martynyuk and P. A. Doroshenko, Institute of Physiology
imeni A. A. Bogomolets, UkSSR Academy of Sciences, Kiev]

[Abstract] Isolated, intracellularly perfused, neurons of the snail *Helix pomatia* were employed in a system designed to assess the effects of extracellular concentrations of calmodulin inhibitors on calcium currents. In concentrations of 10^{-7} to 10^{-5} M the inhibitors, chlorpromazine and trifluoroperazine (triftozine), increased the amplitude of Ca currents, and in concentrations greater than 10^{-5} M diminished the current, with complete inhibition evident with concentrations of 10^{-4} M. The putative mechanism of action used to explain these results rested on the assumption that chlorpromazine and trifluoroperazine enhanced binding of Ca^{++} to receptors in the channels. In the presence of low inhibitor concentrations enhanced binding favored more efficient Ca ion transport. However, in the presence of high inhibitor concentrations the binding of Ca^{++} was enhanced to such a degree that the strength of binding prevented ion movement or translocation and, hence, abolished the Ca current. Figures 2; references 15: 1 Russian, 14 Western.

12172/12955
CSO: 1840/449

UDC 612:591.1

FUNCTIONAL CHANGES IN CNS IN STUDENTS IN COURSE OF STUDY DAY

Tbilisi SOOBASHCHENIYA AKADEMII NAUK GRUZINSKOY SSR in Russian Vol 122, No 3, Jun 86 (manuscript received 15 Jun 84) pp 605-608

[Article by G. G. Eliava, A. T. Gedevanishvili, K. R. Kikvidze and A. B. Grigoliya, Tbilisi State Medical Institute]

[Abstract] The functional status of young adults was studied in a group of 19-20 year old students in terms of sensorimotor response time in the course of a study day. Analysis was conducted of the effects of a verbal warning signal ("attention") preceding an acoustic stimulus (205, 1000 or 8000 Hz) on the latency of a motor response. The shortest response time was obtained with the 250 Hz signal, with a 4 sec interval between the warning signal and the stimulus. Latent periods for the motor response increased almost two-fold after eating and after a period of study-related activities. The increase in the latent periods was ascribed to enhancement of diffuse inhibitory processes in the CNS by multifactorial sensory stimuli encountered in daily activities. Figures 3; references 7 (Russian).

12172/12955
CSO: 1840/446

UDC 617.755:656.022-073

LIGHT SENSITIVITY IN MERCHANT MARINE SEAMEN DURING PROLONGED PASSAGES

Odessa OFTALMOLOGICHESKIY ZHURNAL in Russian No 8, 1985
(manuscript received 14 Sep 84) pp 494-497

[Article by C. S. Ponomarchuk, candidate of medical sciences and M. K. Voloshin, physician, Odessa Scientific Research Institute of Eye Diseases and Tissue Therapy imeni Academician V. P. Filatov; Shipping Basin Clinical Hospital]

[Abstract] In order to assess the adaptive capacity of the CNS under conditions presented by a prolonged (122 day) passage on a merchantman, 15 seamen were subjected to an analysis of light sensitivity in relation to time and salivary concentrations of sodium and potassium. The measurements demonstrated that, beginning with the 17th to the 22nd day aboard ship, optical sensitivity to light begins to diminish and decreases for the duration of the trip. The sensitivity of both the rods and the cones was affected in a similar manner, although the cones represented a less sensitive indicator of changes in physiological adaptation. Analysis of the electrolytes showed that sodium concentration began to diminish at about the 17th to the 22nd day, falling by ca. 20-30% in comparison with the concentration existing at the beginning of the trip. Potassium levels fluctuated by no more than 4-6%, resulting in a decrease in the Na/K ratio by 0.1-0.2 units ($P < 0.05$) from the initial value of 0.5 ± 0.07 . Changes in the electrolyte balance are, therefore, proposed to account for the diminished efficiency of the visual analyzer. Figures 1; tables 2; references 11 (Russian).

12172/12955
CSO: 1840/019

UDC 612:599.32

EFFECTS OF AMBIENT TEMPERATURE ON CIRCADIAN DYNAMICS OF MOTOR, FEEDING AND DRINKING ACTIVITY IN RATS

Ashkhabad IZVESTIYA AKADEMII NAUK TURKMENSKOY SSR. SERIYA BIOLOGICHESKIKH NAUK in Russian No 3, May-Jun 86 (manuscript received 15 Apr 86) pp 9-13

[Article by F. F. Sultanov, R. Tadzhiyev and A. I. Freynk, Institute of Physiology and Pathology in the Arid Zone, Turkmen SSR Academy of Sciences]

[Abstract] In order to assess the effects of ambient temperature on the circadian dynamics of feeding, drinking and general motor activity, a special device was constructed to monitor such activity in outbred male rats in relation to time and temperature. At 24°C and illumination from 0800 to 2000 hours most of the motor activity was concentrated in the dark period (2000 to 0800 hours), representing 56.17% of total motor activity. The acrophase for motor activity occurred at 11:28 PM. Both feeding and drinking activities showed two circadian maxima: between 0800 and 1200 hours (29.51%), and between 1800 and 2200 hours (26.51%). Raising the temperature to 34°C during the light period had no profound long-term sequelae in terms of motor activity. However, a temperature of 36°C during the light period, which constitutes a stress factor in the case of rats, resulted in a shift of motor activity to the cooler phase, i.e., the dark period. These changes in behavior were indicative of the adaptability of the animals to changing environmental conditions, with adaptability including alteration of circadian behavior patterns. References 19: 8 Russian, 11 Western.

12172/12955
CSO: 1840/036

PUBLIC HEALTH

FEE-CHARGING FOR SOVIET MEDICAL CARE

Moscow IZVESTIYA in Russian 11 Jul 86 p 3

[Article by L. Ivchenko, under the rubric "Reflections on Letters"]

[Text] Hundreds of letters are piled on my desk. What's surprising is not that the publication of "'Poor' millionaires" [IZVESTIYA, No 21, 1986] drew such a lively response, for the state of the medical service stirs every one of us. Rather, it is the heavy torrent--a veritable rain of letters--that befell us after the publication of the responses to "'Poor' millionaires."

Readers entered into verbal duels with other readers. Many who had not seen the article itself and had read only the letters approving fees for medical services jumped to conclusions: it would seem that better treatment is available, but for money! And they took the hint: if you want better treatment, pay. But isn't this a threat to our social achievement--the right to free health care?

"The attempt to revive charges for treatment is nothing other than a violation of workers' constitutional rights," writes A. Bondarenko from the city of Chernovtsy. Just such a warning was expressed by other readers, among them M. Shamayeva (Murmansk), I. Dakhnovskiy (Berdyansk), N. Kazakova (Chelyabinsk), B. Salatun (Tallin), and A. Yefimenko (Andizhan). Kerch resident N. Motornyy even accused K. Sonin, I. Shepelev, and D. Demekhin, whose letters were published in IZVESTIYA, of "not fighting for the improvement of medical care for the people, but rather for privileges for those with fat purses."

"To write that the time is ripe to make the transition to fee-bearing medical care is simply crazy," says I. Barbal from the city of Ocher in Perm Oblast.

We did not write that, alarmed readers, we did not write that! We did not write about any such "transition." Let us remind you that the topic of conversation was that self-supporting outpatient clinics that provide medical services to the population for fees are themselves in distress and cannot operate as they are supposed to. And since they exist, and the demand for them is not decreasing, they must have normal operating conditions and supply. How is this a "transition" to fee-bearing medical care?

Fee-bearing medical services account for 0.4 percent of the total services provided within the health care field, explains V. Treskunov, deputy chief of the Main Directorate of Treatment and Preventive Medicine in the USSR Ministry of Health. And if the volume of fee-bearing services increases by a factor of 1.6 in the present five-year plan, that's because the entire health-care network is also growing. Thus, the percentage remains what it was before--more accurately, a fraction of a percent. Besides, in the self-supporting operation, we are developing, first, those types of medical care for which it doesn't matter right now if they are fee-bearing--for example, denture making, cosmetology, certain physiotherapy procedures. The basic principle of socialist health care--free medical care--is not violated, and the one does not in any way contradict the other. Self-supporting out-patient polyclinics are supplementary units where, for a modest fee, people can obtain supplementary consultation and procedures.

So the question rests on the co-existence of the two. One mustn't forget that seeing a fee-charging physician is a purely voluntary matter. We have government-sponsored housing existing side by side with housing cooperatives. And it would hardly occur to anyone to call this form of construction anti-constitutional, one that "undermines the bases of socialism."

"In my view, the discussion of whether or not self-supporting out-patient polyclinics are needed is an odd one," writes M. Gostev from Voronezh. "Of course they're needed! Both are needed--the fee-charging clinics as well as the free clinics. And the more we have, the better it is for the people: it gives a person another possibility, another way out if he needs it. Maybe he hasn't found the right specialist where he lives, or he has some doubts about a diagnosis, or he wants something a little faster--any number of things... We used to have such a clinic in Voronezh, but they closed it. But what are people supposed to do if the health-care agencies can't improve free medical care and don't want to improve fee-based care?"

That letter contains the answer to the question posed by the malcontents: Why do we have fee-charging out-patient polyclinics? Before, they say, they were a counterbalance to private practice--that much we understand. But why not? The fact is that it gives a person a choice--a choice of consultation and of a physician he can trust. In an ordinary polyclinic, the choice is not always there. Consultations in the self-supporting clinics help to propagate the latest scientific achievements in medicine. "Physicians in the fee-charging polyclinic in the city of Ivanova saved my wife from disability," N. Krutov wrote us from the city of Komsomolsk in the Ivanovo Oblast. "She walked with crutches because of poor circulation in the legs. The Ivanovo medical personnel used a treatment method that was new at the time. Generally speaking, the Ivanovo polyclinic is well thought of. But it's been closed--supposedly for repairs."

Many--unfortunately, very many--complaints in the letters were about the poor organization of the medical service in various places. Rostov-on-Don resident, N. Popkova, tells how one district physician there deals with patients: the doctor refuses to see patients if they have as much as a high temperature; he appears on house calls, screaming, couldn't they, he

says, have made the trip themselves; prescriptions for even the most basic medicines are hard to get. The reader then cites as an example the work of another physician who was taking the place of his colleague, who was on leave: the patients could not praise him enough.

To this, N. Popkova (whose sentiments are shared by Riga resident E. Parmenkova and a group of colleagues; Ye. Kochetkov from Petropavlovsk-Kamchatskiy; A. Lazarev from Taganrog; N. Belyy, a resident of the settlement of Karagayly in the Karaganda Oblast, and others) asks the question: "Why must these two district physicians receive identical pay? The patient should be given the right to see another physician if 'his own' is not working out; but then some proportional amount of the pay should be transferred to the chosen physician. And then it would be immediately evident who works how. Wouldn't this be a way to encourage quantity and quality of labor; no general pay raise for medical workers will produce that result, if both the conscientious and the careless receive the same."

Resident Gomelya M. Indman argues with A. Korchevskiy, whose letter was published in IZVESTIYA: "It's not the fee-charging polyclinics that can 'undermine the socialist order,' it's the disarray in the free polyclinics! That very thing forces people to look for another way. It's long been time to bring about some order." That reminds me of a conversation overheard among patients at a self-supporting polyclinic: "It costs even more at a free clinic," reasoned one woman. "There they just look in your mouth and at your hands, and if you came with something, you leave with the same thing."

It doesn't, of course, pay to generalize. We know of a wealth of examples (and have recounted them on the pages of the newspaper) of selflessness, sensitivity, unselfishness, and high levels of professionalism among our medical personnel. But, as we see, there is the sad experience of another attitude about the matter. Here's what A. Kopyy, from Baku, writes: "Often we don't get even a particle of the attention that we have a right to expect from medical personnel. Besides, as much as it has become the vogue here to 'thank' physicians with round sums, expansion of self-supporting medical care could only come to good... It would be better if I paid the government." She suggests introducing the strictest controls on admissions to medical schools, to suppress this utilitarian approach to the sacred profession of the physician.

Those sentiments are echoed by S. Bykov (Donetsk), D. Kostyukov (Simferopol'), and many others.

As we see, the responses expanded the topic of the discussion, identifying a number of problems that require the public's attention. I told workers at the USSR Ministry of Health about these letters. They confided that the topic of material incentives for medical personnel is being discussed. And they are taking steps to improve the quality of diagnosis and consultation. By the end of next year, a total of 317 diagnostic polyclinics (departments) will be open in all the republics; nearly two hundred of them are already in operation. The Ministry of Health plans to create 400 such urban units during the current five-year plan; unlike the territorial

polyclinics, these will have the newest diagnostic equipment. During working hours, specialists of the highest caliber will see the people--at no charge, of course. On their own time, however--that's a private matter. One may use his free time to go fishing; another, to read. A third, however, may want to earn extra income at a self-supporting clinic. And one can only welcome that: it raises the general level of health care. As Moscow physician-psychiatrist T. Belyavskaya writes, "We'll all be the winners, and so will our health."

Incidentally, in the mail to our editor after the publication of the article "'Poor' millionaires," there were many letters from physicians. An altogether "seditious" thought on fee-charging hospitals was expressed by Leningrad surgeon A. Kharakh. "I have worked as an oncologist for nearly 30 years," he writes. "How many unfortunate patients and their relatives have passed before my eyes! Many begged to have the patient admitted to the hospital no matter what the cost, because there was no way to provide the needed care at home. But until now, we haven't had any such hospitals."

Such a place is needed not only for cancer patients, but also for other chronic patients who are confined to bed for lengthy periods. Caring for a patient is very complicated for a working family. Relatives go without vacations and the usual holidays for years; able-bodied members of society are at times forced to retire and, at the peak of their careers, remove themselves from public life. In a word, the relatives find themselves right in a trap. Wouldn't a fee-charging hospital be a way out of this? asks his countryman, B. Bessonova, in support of the physician.

The opinions expressed, then, were quite varied. Many readers--physicians and patients alike--were anxious that, in the course of the discussion, the main question not be lost: how can the self-supporting polyclinic be helped?

The USSR Ministry of Health hasn't provided an answer to this question yet. There is, however, a report from the Administration of Self-Supporting Treatment Units that the Main Administration of Health in Moscow has ordered that 4,191,000 rubles be appropriated to the city budget--the total profits amassed by the self-supporting polyclinics over the years and badly needed by the city for the current repairs, for obtaining equipment, and for other pressing needs. That's how the Main Administration helps its self-supporting network! So that the millionaires are now literally poor...

13227/12955
CSO: 1840/1265

UDC 616.15-074

LABORATORY SUPPORT FOR DISPENSARIZATION OF HEMATOLOGIC PATIENTS

Moscow LABORATORNOYE DELO in Russian No 10, Dec 85
(manuscript received 10 Jan 85) pp 707-710

[Article by V. T. Morozova, R. L. Martsishevskaya, T. I. Yegorova and
N. A. Avdeyeva, Central Order of Lenin Institute for Continuing Education
of Physicians, Moscow]

[Abstract] The dispensarization of disease prevention and treatment used in the Soviet Union allows active identification, observation and treatment of patients with blood system diseases, including those with anemia, leukoses and other malignant neoplasms of the circulatory organs, as well as patients with any hematopoietic apparatus deficiency. The risk group includes close relatives of patients in addition to the patients themselves. The system of tests provided by medical laboratories to support dispensarization of these patients is listed for several subgroups of patients. Dispensarization represents an important part of the total health care provided this contingent of patients, and must mesh with hospital care, which is provided as needed.

6508/12955
CSO: 1840/2253

UDC 616-084.3:008

CITY HOSPITAL DURING TRANSITION TO DISPENSARIZATION OF ENTIRE POPULATION

Moscow SOVETSKOYE ZDRAVOOKHRANENIYE in Russian No 5, May 86
(manuscript received 2 Apr 85) pp 8-9

[Article by N. Alikhanov, Combined Tynismyae Hospital, Tallin]

[Abstract] The steps which have been taken to prepare the author's institution for the upcoming provision of dispensarization services for the entire population are noted, including opening of 3 new medical departments each year since 1981, the conduct of seminars, production of lists of people to be serviced by each medical organization and determination of the sequence in which they will be included in the new services. The medical monitoring commission of the polyclinic has studied the condition of health of the Second World War veterans who will be the first served. Of course, dispensarization of the entire population will mean that a number of people will be discovered to have chronic disease; however, the amount of working time lost to disease should not increase.

6508/12955
CSO: 1840/2274

UDC 616.31-084.3

PARTICIPATION OF DENTIST IN ANNUAL PHYSICAL EXAMINATIONS OF VOCATIONAL SCHOOL STUDENTS

Moscow SOVETSKOYE ZDRAVOOKHRANENIYE in Russian No 5, May 86
(manuscript received 20 Apr 85) pp 9-12

[Article by T. N. Podolskaya, First Leningrad Medical Institute imeni
I. P. Pavlov]

[Abstract] A (dispensarization) program is described, intended to improve the oral prophylaxis skills and habits of occupational school students. Over 77% of students were found to have caries, with an average of 7.6 teeth per student carious, filled or missing. At the moment, dentists at the school spend more time in treating students than in training them in caries-prevention techniques. The following suggestions are made for improvement of the oral health of the students: organize a permanent dental office at every school with over 500 students; perform twice annual dental examinations of all students; assure close connections between school dentists and clinic dentists; maintain systematic and dynamic observation of children with over 6 cavities, history of maxillofacial injury or other complication; increase the content of calcium, phosphorus, vitamins B₁, C and D in the diet; and conduct treatment in two stages: the first by a dentist, the second if required by specialists.

6508/12955
CSO: 1840/2274

UDC 614.3/.4(476)

OPTIMIZATION OF CONTROL AND STRUCTURE OF SANITARY-EPIDEMIOLOGIC SERVICE OF
LARGE INDUSTRIAL CITY

Moscow SOVETSKOYE ZDRAVOOKHRANENIYE in Russian No 5, May 86
(manuscript received 26 Aug 85) pp 17-19

[Article by A. I. Kondrysev and N. V. Shestopalov, Belorussian Ministry
of Health, Minsk City Sanitary-Epidemiologic Station]

[Abstract] A plan for improvement of the sanitary-epidemiologic service of Minsk began to be implemented in 1973. Sanitary-hygienic studies, administration and financing, supervision of conditions of labor at industrial enterprises and bacteriological studies were all centralized. The 6 years of operation with the new centralized structure have confirmed the correctness of the organizational decisions made in the 70s. The position of Deputy Chief Physician has been added to the staff to assist in supervision of the more complex centralized structure of the service. Infectious disease morbidity has decreased by 23.7% since 1971, with still greater reductions achieved for some individual diseases. The quality of products of food industry enterprises has improved by a factor of more than 2. An organizational chart listing the major positions and departments is presented. References 10 (Russian)

6508/12955
CSO: 1840/2274

UDC 616-057:63(47+57-22)-036.2-082

CLASSIFICATION OF POPULATED POINTS AS TO RATE OF UTILIZATION OF RURAL MEDICAL SERVICES

Moscow SOVETSKOYE ZDRAVOOKHRANENIYE in Russian No 5, May 86
(manuscript received 29 Nov 84) pp 30-33

[Article by A. P. Airiyan, doctor of medical sciences, A. Ye. Mkrtchyan and A. A. Ordukhanyan, candidate of biological sciences, Ararat Central Rayon Hospital, Ministry of Health, Armenian SSR]

[Abstract] The purpose of this work was to develop several approaches for objective selection of rural populated points to reflect the actual level and structure of morbidity of the administrative units. The material for the study was data on ambulatory polyclinic services for 1979 in rural Ararat Rayon, Armenian SSR. The level of morbidity in each specific populated point was determined by grouping visits according to residents and 17 major classes of diseases. A tree graph was then constructed illustrating the resulting clustering of the populated points, yielding finally a homogeneous group of objects representing populated points with the ambulatory polyclinic utilization frequency most characteristic for the entire rayon. This allows selection of populated points most fully reflecting the picture of morbidity of the region. Figure 1, references 4: 2 Russian, 2 Western.

6508/12955
CSO: 1840/2274

UDC 616-082.4(47+57)

REDUCING THE DIFFERENCE BETWEEN URBAN AND RURAL HOSPITAL CARE

Moscow SOVETSKOYE ZDRAVOOKHRANENIYE in Russian No 5, May 86, pp 70-71

[Review by R. S. Gadzhiev, candidate of medical sciences, Tula Oblast, of the book "Puti Sblizheniya Urovney Statsionarnoy Pomoshchi Gorodskomu I Selskomu Naseleniyu", Kishinev, Shtintsa Press, 1984, 188 pp by N. A. Testemitsanu and D. V. Tintyuk]

[Abstract] The book consists of four chapters, an appendix and a subject index. It describes hospital institutions in rural areas of Moldavia, covering all 221 uchastok hospitals, including some without centralized water supply, heat, sewerage or hot water. The authors approach the problem in a complex manner by studying the medical, economic and social effectiveness of hospital care during various stages of hospitalization of rural workers. A special study was used to determine cost per bed-day as a function of degree of utilization of beds in hospitals of varying size. An expert evaluation of 3066 charts indicated that 94.1% of hospitalizations were necessary, in 90.6% of cases examinations were complete, in 88.1% of cases diagnoses were correct and in 95.1% of cases treatment was complete.

6508/12955

CSO: 1840/2274

UDC 614.2(477-22)(049.32)

RURAL PUBLIC HEALTH MANAGEMENT

Moscow SOVETSKOYE ZDRAVOOKHRANENIYE in Russian No 5, May 86, pp 72-73

[Review by B. G. Vedenko, candidate of medical sciences, Vinnitsa, of the book "Kiev, Zdorov'ya Press, 1984, 64 pp., by V. G. Khodakovskiy.]

[Abstract] This book, a part of the series "Leading Experience Library," deals with the problem of administration. The author indicates that all activity of rural public health workers is regulated by administrative processes and that optimization of administration can be achieved only by a systems approach. The major goals of the public health administrative system of a rayon are scientifically developed. Great attention is given to the creation of a good psychological climate in the administrative apparatus, the utilization of leading experience and the achievements of science. A number of fruitful ideas are set forth, implementation of which can facilitate more effective administration of specialized medical assistance. Though it is said to contain some inaccuracies, the book is evaluated as useful for public health service organizers and administrators.

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SOVIET PUBLIC HEALTH

Alma Ata AGITATOR KAZAKHSTANA in Russian No 10, May 86, pp 21-22

[Editorial Article: In the Name of People's Health]

[Abstract] Advantages and achievements of Soviet medicine in general and that of Kazakh SSR in particular were reported and compared to the inadequacies in the USA and other capitalistic countries. Average life expectancy in the USSR has increased two-fold, mortality decreased by a factor of three. There are 40 physicians per 1000 population and qualified medical care is free. Sixteen billion rubles is allocated for the health budget annually; many patients get free medications; 45% of the population is examined annually in a health screening mode, the goal being 100% annual screening. Public Health efforts are directed towards housing and work hygiene, unpolluted environment and extension of medical care to the countryside. Great strides have been made in antialcoholic propaganda and public education, especially in the field of nutrition. Many physicians were recognized with high prizes for their contribution to Public Health. Figure 1.

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COMPUTERS AND WOMEN'S HEALTH

Riga NAUKA I TEKHNIKA in Russian No 5, May 86, pp 6-8

[Article by N. A. Andreyev and S. V. Andreyeva, Latvian Scientific Research Institute of Cardiology and Riga Medical Institute]

[Abstract] Advantages and potential of computerized diagnosis and prognosis are advocated. The problems of the limitations of computer memory are brought to light, stressing the need for better modelling and more precise development of risk factors. One of the complexities in handling gynecological-obstetrical problems is that they are not isolated entities but interrelate with other health factors: cardiac, pulmonary, digestive etc. The use of computerized prescreening is considered adequate inasmuch as it has agreed about 86-90% with clinical diagnosis. The immediate goal is the search for new risk factors and better methods of mathematical analysis of data. Figures 4.

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AID TO "FIRST AID" SERVICE

Moscow ZNANIYE -- SILA in Russian 6 Jun 86 p 10

[Article by I. Altufyev: Pomoshch "Skoroy Pomoshchi"]

[Abstract] The program "Support System for Reaching Diagnosis" is described as one which was designed to assist physicians in reaching proper diagnoses. This computer-assisted task was developed under the direction of Oleg Ivanovich Larichev at the All-Union Scientific Research Institute of Systems Research. Subsystems "Coma", "Ischemic Heart Disease" and "Sharp Stomach Pains" include a number of diseases with numerous symptoms which could be grouped in four subsections: patient complaints, history of illness, examination and laboratory data. Each has a minimum of two possible answers; even at this stage it is a job too big for computers to analyze all possible permutations. Therefore, the physician is the decisive body controlling the interaction with computer. Elimination of irrelevant information is done on the basis of contradictory situations. This program is designed to assist physicians in trauma situations. Figure 1.

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PUBLIC HEALTH RESOURCES

Tashkent EKONOMIKA I ZHIZN in Russian No 3, Mar 86, pp 59-61

[Article by K. Bakirkhanov, Director, Main Administration of Therapeutic --Prophylactic Service, UzSSR Ministry of Health and B. Umurzakov, Director of Planning-Financial Administration of the Ministry; L. Mironova, Chief of Medical Statistics Division of the Ministry)]

[Abstract] During the last five year period, 100 new hospitals have been opened in Uzbekistan along with 20 polyclinics and 350 pharmacies; more than 15,000 physicians and pharmacists, along with over 42,000 medical support staff, entered this system. But growth alone is not as important as rational, effective utilization of these resources. One of the measures of effectiveness is the utilization of hospital beds. The range of this measure in 1984 was from 307 to 325 days per year; about 24.2% of all beds were not being used at the time of this writing (that's a lot of money being wasted if one considers 8-9 rubles cost per bed per day). This is due to improper assignment of beds: there is an excess of surgical and general-therapy beds but great shortages in neurosurgical, orthopedic and endocrinological services. Modern analysis of bed utilization could solve the problem. In some areas, bed utilization is adequate. About 20% of the patients could be served on an outpatient basis; wider use of polyclinics is advocated.

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PROSPECTS OF PUBLIC HEALTH DEVELOPMENT IN MOUNTAINOUS REGIONS OF AZERBAIDZHAN
SSR

Baku NARODNOYE KHOZAYSTVO AZERBAIDZHANA in Russian No 5, May 86, pp 41-46

[Article by R. M. Kasumov, I. Yu. Andreyeva, Scientific Research Institute of State Planned Economy, AzSSR, and R. G. Kuliyeu, State Plan AzSSR]

[Abstract] The strategy for the Public Health Program for 1986-1990 and to the year 2000, is based to a large extent on expanded prevention activities, population-based annual health screening and implementation of medical sanitation measures commissioned by demographic politics of the Party. One of these considerations is oriented at expanding Public Health Programs to the isolated mountainous populations, where the midwife-feldsher team is still the only medical assistance available to the population with no drug-dispensing capability and rather limited facilities. The proposed solution to this problem is the organization of ambulatory polyclinic facilities which have been expanded considerably to cover rural population (but not the mountainous regions). In the mountains this service should be modified to include mobile teams capable of periodic visits to isolated hamlets. Current state of the existing mountain hospitals is totally inadequate and should be improved (42% have no central water system, 80% have no gas, 83.6% have no sewer system and the bed space is 60% of the acceptable standard). These inadequacies must be corrected.

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PSYCHOTHERAPY IN GENERAL AMBULATORY POLYCLINIC NETWORK

Moscow SOVETSKOYE ZDRAVOOKHRANENIYE in Russian No 5, May 86
(manuscript received 5 Oct 85) pp 27-30

[Article by V. A. Ovsyannikov, Central Order of Lenin Institute for Advanced Training of Physicians, Moscow]

[Abstract] The past decade has seen attempts to create new forms of psychiatric and psychotherapeutic treatment for use in institutions of the general ambulatory network. The purpose of this article is to provide a scientific basis for the need to organize psychotherapeutic treatment for the contingent of patients with hypochondriac states within the general ambulatory polyclinic network. Patients at Polyclinic No 71 in Moscow were studied over a period of 5 years, and 302 were found to belong to the hypochondriac group with psychosomatic symptoms (240 females, 62 males). Significant numbers of the patients came from families with unharmonious relationships. More than half of the patients were diagnosed initially as having autonomic-vascular dystonia, autonomic-endocrine dysfunction and other nosologically unclear classifications. Patients who were referred to a psychiatrist frequently refused to go, out of fear of the consequences of a psychiatric consultation. However, clinical manifestations of psychosomatic illness can be sufficiently severe to cause somatic hospitalization. The frequent incorrect or incomplete diagnosis and inadequate treatment provided these patients justifies their classification as patients with latent illness and requires the organization of psychotherapeutic treatment, as well as increased education of somatic physicians to recognize these patients. References 5: 4 Russian, 1 Western.

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PSYCHOLOGY

PSYCHOLOGY AND BRAIN

Moscow FILOSOFSKIYE NAUKI in Russian No 3, May-Jun 86, pp 45-57

[Article by V. I. Kuptsov, doctor of philosophical sciences, Department of Philosophy of Natural Phenomena, Moscow State University imeni M. V., Lomonosov and S. V. Kuptsova, Chair of Theory of Scientific Atheism, Philosophy Faculty, Moscow State University imeni M. V. Lomonosov]

[Abstract] The seminar "Psychology and Brain: Philosophical Aspects" was held 19 Nov 85 at Moscow State University imeni M. V. Lomonosov with attendance exceeding 300. V. I. Kuptsov opened the meeting with a forward look towards the next 15 years of scientific activity in the field of human psychology. D. I. Dubrovskiy talked about philosophical aspects of psychology and brain, referring to interactions between genetic factors and psychological characteristics of individuals. M. G. Yaroshevskiy addressed the conceptual indivisibility of psychological and physiological components of individuals. P. V. Simonov talked about methodological principles in studies of brain and psychology (psychological and neurophysiological phenomena, subjectivity-objectivity, predetermination, creative intuition). Yu. M. Pratushevich discussed informational interaction of individuals with the surroundings. T. A. Dobrokhotova addressed the above topic from the aspect of functional asymmetry of brain hemispheres. Ye. N. Sokolov speculated on the question of individual conceptualization of the surroundings. G. A. Vartanyan noted that psychological components of the whole should not be separated from the physiological ones. F. A. Ata-Murado addressed the importance of analyzing genetic predetermination of psychological characteristics. Proper scientific approaches to answering research questions were discussed by Yu. V. Gulyayev. V. S. Tyukhin addressed historical aspects of the controversies between psyche and brain studies. A. G. Spirkin noted that not only psychological functions of brain are social phenomena, but the brain itself is an essence of human social being. And finally, S. T. Melyukhin noted that descriptions of psychological processes should not contradict the laws of the material world.

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EFFECT OF GAMMA-IRRADIATION OF POLLEN ON GROWTH AND DEVELOPMENT OF PLANTS

Kiev DOKLADY AKADEMII NAUK UKRAINSKOY SSR. SERIYA B: GEOLOGICHESKIYE, KHIMICHESKIYE I BIOLOGICHESKIYE NAUKI in Russian No 7, Jul 86
(manuscript received 17 Jan 86) pp 55-57

[Article by S. V. Andreyenko and D. M. Grodzinskiy, corresponding member of the UkSSR Academy of Sciences, Institute of Plant Physiology, UkSSR Academy of Sciences, Kiev]

[Abstract] Comprehensive analysis is performed of the effect of gamma-irradiation of pollen on the processes of embryogenesis, seed formation and development of mature plants. The role of male and female genome in the induction of phenotypic mutation is evaluated. Experiments were performed on hybrid petunia irradiating its pollen with the ^{60}Co source at a dose of 7.2 Gr/min. It was shown that valuable plants were obtained after pollination with pollen exposed to 100 Gr. Higher doses produced chlorophyll-free mutants which died in the early stages of development. Increasing the exposure dose (within the 0-100 Gr range) led to prolonged vegetative period and diminished plant size at the time of blooming. Embryogenesis and seed development were also affected by the exposure dose. Figure 3; references 13: 6 Russian, 7 Western.

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EFFECTS OF IONIZING RADIATION ON DEVELOPMENT OF BIRCH SEEDLINGS

Sverdlovsk EKOLOGIYA in Russian No 4, Jul-Aug 85
(manuscript received 24 May 84) pp 78-80

[Article by V. N. Pozolotina, Institute of Plant and Animal Ecology, Urals
Science Center, USSR Academy of Sciences]

[Abstract] Birch (*Betula verrucosa* and *B. pendula*) seeds and one month and one year old seedling were gamma irradiated (50-200 Gy, 1.5 Gy/sec) to assess the effects of exposure to ionizing radiation on plant development. A two-year monitoring period demonstrated that the young vegetative forms were, in general, four-fold more radiosensitive than the resting seeds, when assessed on the basis of the length of terminal shoots, secondary shoots, leaf counts, and leaf length. The morphological changes were generally dose-related, with plants irradiated at the one-year stage showing earlier recovery than seedlings irradiated at the one-month stage of development. The length of the terminal shoot appeared to be the indicator of choice for easy evaluation of the radioecological consequences of exposure to ionizing radiation. Figures 1; references 8: 6 Russian, 2 Western.

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