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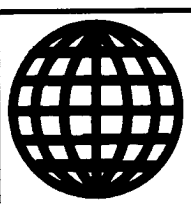

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Radioprotective Effect of Low-Energy Acoustic and Magnetic Fields

18400444 Moscow NTR: PROBLEMY I RESHENIYA in Russian No 7 (94), 1989 p 2

[Article by F. Romanov: "Telepathy in a Scientific Light"]

[Text] At the end of March 1989, an unusual conference was held at the Institute of Engineering Science imeni A. A. Blagonravov of the USSR Academy of Sciences. A score of experts with top credentials, specialists in various fields of knowledge ranging from mechanics to psychology, discussed the theoretical aspects of ultraweak interactions of field and matter that produce technotropic, biotropic and psychotropic effects.

Mentioned at the meeting were telepathy, ESP and other things not usually taken seriously by serious scientists. In this case, however, the discussion was focused on important and, until quite recently, classified research whose results are for the first time being made available to the general scientific community.

...Academician V. P. Glushko, a leading Soviet rocket-builder, the general designer at the Energiya NPO [research and production association], and holder of numerous prizes and awards, considered the nearest objectives of manned spaceflights to be a manned flight to Mars and industrial development of near-Earth space as a source of raw materials for industry in the 21st century. Both these objectives involve a long stay of people in space and require developing new methods of maintenance of the health of cosmonauts. Ordinary pharmacology will be unsuitable in this case: the hypodynamic environment and weightlessness reduce the efficacy of metabolic processes and limit the water-salt metabolism. In other words, drugs are assimilated in an unusual way and may have unexpected effects.

In 1983 Valentin Petrovich Glushko learned of the unusual experiments conducted at the Institute of Medical-Biological Problems by V. K. Kanyuk and Ye. Ye. Kovalev. Their research was based on ideas developed by professor A. L. Chizhevskiy, a well-known Soviet scholar and pioneer in heliobiology, who in the 1930's subjected to scientific analysis those changes in living organisms caused by energetically weak actions of various physical natures. Chizhevskiy obtained unique results that were far ahead of their time. Subjecting various biological objects to low-energy (noise level) acoustic informative fields or variable low-intensity magnetic fields, Kanyuk and Kovalev caused reproducible biotropic and psychotropic effect in experimental animals. The results were particularly impressive when, for example, the action of five-minute specially selected acoustic signals produced a partial survival in mice earlier subjected to a lethal dose of ionizing radiation. This brought up the possibility of an innovative form of protection from radiation, essential for long spaceflights.

For advancement of this research, a Scientific-Research Complex for Space Biophysics was instituted in 1985 at Energiya NPO headed by candidate of biological sciences V. K. Kanyuk. A few dozen scientists, in cooperation with specialists from several universities and academy institutes, were engaged at this center in the solution of application problems and development of theoretical models to explain ultraweak informational interactions.

In the time elapsed since then, the center has constructed unique tools for the study of biotropic effects from weak acoustic, light and magnetic (variable) fields and other actions on living organisms. A method of active protection of biological objects from ionizing radiation has passed official government experimental testing. However, since the death of V. P. Glushko, this research program has been shrinking, and, currently, the NIK [Scientific Research Complex] of Space biophysics is in a difficult situation. ...

A report on the current situation and a more detailed description of the essence of the research performed by the center is to appear in one of the next issues of NTR.

UDC 616.281-71

'Vertigo' Expert System: Methodology and Clinical Applications

18402077A Kiev ZHURNAL USHNYKH, NOSOVYKH I GORLOVYKH BOLEZNEY in Russian Vol 2, 1989 (manuscript received 20 Oct 88) pp 23-27

[Article by V. I. Pivrikas, Chair of Eye, Ear, Nose and Throat Diseases, Kaunas Medical Institute]

[Abstract] Cursory description is provided of the Vertigo expert system designed to facilitate the diagnosis of peripheral vestibular disorders. The system, developed at the Soviet-Bulgarian 'Inter-Programma' Scientific Resarch and Planning Institute, is designed to be run on an IBM XT-Turbo PC. The program provides menus leading to dialog boxes and 'yes' or 'no' choices, and is particularly suited to dealing with labyrynthitis, Meniere's disease, cupulolithiasis, various vestibular syndromes of vascular, traumatic, and infectious-toxic etiology, vestibular neuronitis, and acoustic neuroma. The structure of the expert system and the diagnostic process are explained in flow chart form. Currently, the Vertigo system is undergoing further testing and refinements by determination of the degree of concordance between the diagnostic results obtained with the system with the clinical findings of an otolaryngologists. Figures 3; references 13: 11 Russian, 2 Western.

UDC 577.27

Immunoliposome Complexes: Preparation, Characterization, and Directed Delivery in Human Endothelial Cell Culture

18400530a Moscow BIOLOGICHESKIYE MEMBRANY in Russian Vol 6 No 2, Feb 89 (manuscript received 24 Jun 88) pp 143-148

[Article by V. S. Trubetskoy, O. V. Trubetskaya, S. P. Domogatskiy, and V. P. Torchilin; Institute of Experimental Cardiology, All-Union Cardiology Science Center, USSR Academy of Medical Sciences, Moscow]

[Abstract] Previously, the authors had described a model of the directed transport and internalization, in a culture of human endotheial cells, of immunoliposome complexes (ILC) that had been aggregated in a suspension with the aid of an avidin-biotin system. The detailed structure of these complexes was investigated in this work. The immunoglobulin fraction (IgG) of non-immunized mice was used as the control antibody. Liposomes, consisting of 0.05 mole phospholipid label (dipalmitoyl biotinyl amidocaproyl ethanolamine) and [^{125}I]dipalmitoyl-*p*-oxyphenyl propyl phosphatidyl ethanolamine in 1 mole dipalmitoyl phosphatidylcholine, were prepared by exposing a suspension of phospholipids in a phosphate-saline buffer (PSB) at 55°C to sonic waves for 5 minutes. The E25 and IgG immunoglobulins were modified with sulfosuccinimidyl-6-(biotinamido)hexanoate. The ILCs were prepared by adding 0.5-5 μg avidin in 2-40 μl PSB to a suspension of liposomes (2-10 μg lipid in 300 μl PSB, containing 2 mg/ml beef serum albumin (PSB-BSA)). After a given amount of time, liposome aggregation was stopped by adding biotinylated immunoglobulins (E25 or IgG). Change in the cloudiness of the liposome suspension over time was monitored with a spectrophotometer. Addition of biotinylated immunoglobulins to the system led both to restriction of further growth in the forming particles' size and to immobilization of vector molecules on their surfaces. The starting liposomes were 0.1-0.2 μm in size, while the ILCs were approximately 1 μm. The ILCs were able to sorb onto a surface coated with avidin because of the biotinylated groups on the ILC surface which remained free during the aggregation process. ILC-E25 preparations specifically bound with a culture of human endothelial cells. It was determined that approximately 250-500 ILC complexes specifically bound to the surface of one cell. A preparation which is capable of specifically binding with cell-targets makes it extremely simple to obtain and subsequently mix three system components in a test tube. In actually using this approach for directed delivery of medicine to sites on the endothelial lining of blood vessels, components of the system (aggregations of biotinylated antibodies and liposomes with various encapsulating preparations) can be prepared separately. The proposed method allows one to combine the various elements of these aggregations easily for achieving the maximum therapeutic effect. In the case of directed delivery of liposome contents inside cells, vesicle size can play an important role. Although the ILCs discussed exceed the 300 nm maximum size for receptor-dependent endocytosis, they can deliver a larger volume of contents when absorbed by non-receptor-dependent endocytosis or when the contents enter the cell via specific transport systems (as do antiviral preparations). The described immunoliposome complexes, prepared by partial aggregation of biotinyl-containing liposomes with the aid of avidin, and which carry biotinylated immunoglobulins on their surfaces, can be used in directed delivery of substances to the cell surface. Figures 5; references 17 (Western).

UDC 612.112.94.017

Interleukin-1-Like Factor from Human B-Lymphocytes Tranformed by Epstein-Barr Virus

18402088 Leningrad TSITOLOGIYA in Russian Vol 31 No 2, Feb 89 (manuscript received 29 Dec 87) pp 226-233

[Article by A. Yu. Kotov, A. S. Simbirtsev, N. D. Perumov, S. A. Ketlinskiy, All-Union Scientific Research Institute of Ultrapure Biological Preparations, Ministry of Medical and Microbiological Industry, Leningrad]

[Abstract] The interleukin-1 obtained from B-lymphocytes reinforces proliferation of fibroblasts, has cytotoxic effects on tumor cells and stimulates proliferation of B-lymphocytes. Some clones of transformed B-lymphocytes produce interleukin-1-like factors which differ somewhat from IL-1 from macrophages in terms of biological properties. B-cell line 3B6 produces an IL-1-like factor with a different N-terminal amino acid sequence, smaller molecular mass, and the absence of certain types of biological activity inherent in macrophage IL-1. The reason is not yet known. This article studies the parameters of production and biochemical properties of the IL-1-like factor from cell-line NC-37—B-lymphocytes transformed by EBV. The properties of the substance were similar to those of IL-1 from human macrophages. Both have a similar molecular mass of the secreted form and the intracellular precursor and can be associated with the cell membrane. The basic form of the secreted IL-1-like factor has a pI of 6.8, which matches human IL-1. In general, they share biochemical and biological properties and are probably significant in the development and regulation of the immune response. Figures 4; References 18: 1 Russian, 17 Western.

Perfluorganic Compounds Do Not Induce Formation of Cytochrome P-448 in Rat Liver

18400475 Moscow BIOFIZIKA in Russian Vol 34 No 1, Jan-Feb 89 (Manuscript received 17 Apr 86) pp 146-147

[Article by V. V. Obraztsov, D. G. Shekhtman, A. Yu. Grishanova, V. M. Mishin, Institute of Biological Physics, USSR Academy of Sciences, Pushchino, Moscow Oblast]

[Abstract] The introduction of xenobiotics into the body can lead to an elevation in the content of various forms of cytochrome P-450 in the animal liver. Such forms effect hydroxylation of exogenic and endogenic substrates. The introduction of polycyclic aromatic hydrocarbons, however, leads to the appearance of cytochrome P-448 in liver microsomes. That microsomal cytochrome is drawing a great deal of attention because its participation in the hydroxylation of certain polycyclic aromatic hydrocarbons renders it capable of converting them into products that are carcinogenic. It has been reported that intravenous administration of perfluorocarbons to rats causes a two- to threefold increase in the content of cytochrome P-450 in the liver microsomes of experimental animals. This article studies forms of cytochrome P-450 formed in the liver upon administration of a perfluorocarbon emulsion to a line of Wistar rats who had received an intravenous 10 ml/kg dose of the emulsion three days before sacrifice. Examination of the liver microsomal membranes revealed that i/v administration of perfluoroorganic compounds does not cause the appearance of cytochrome P-448 in the liver, indicating that substances such as perfluorodecalin (blood substitute) have no carcinogenic activity. References 6: 5 Russian, 1 Western.

UDC 581.1.035.23

Direct Plant Regeneration from Mesophyll Cells

18402084D Kiev TSITOLOGIYA I GENETIKA in Russian Vol 23 No 1, Jan-Feb 89 (manuscript received 15 May 87) pp 68-69

[Article by G. N. Yurkova, L. V. Sirant and V. A. Trukhanov, Institute of Plant Physiology and Genetics, Ukrainian SSR Academy of Sciences, Kiev]

[Abstract] Four to five week old tomato (Lycopersicon peruvianum) and tobacco (Nicotiana plumbaginifolia) plants were used for the preparation of explants in order to determine conditions favoring plant regeneration from mesophyll cells. The leaf discs were cultured in MS medium supplemented with various auxins. Tomato regeneration was successful with media containing 0.2 mg/L indoleacetic acid (IAA) and 0.2 mg/L 6-benzylaminopurine (BAP), or 1.0 mg/L IAA and 3.0 mg/L zeatin. Large number of runners were also obtained with 2.0 mg/L 2,4-dichlorophenoxyacetic acid and 1.0 mg/L (2-isopentyl)adenine with successive replacement by 2.0 mg/L zeatin. The tobacco experiments yielded large number of runners with successive replacement of 0.5 mg/L α-naphthylacetic acid (NAA) and 0.1 mg/L BAP by 0.1 mg/L NAA by 0. 1 mg/L kinetin. In general, 10 to 50 rubbers were obtained with extensive root formation. Figures 1; references 2: 1 Russian, 1 Western.

UDC 616.36-002-022:578.891]-084(47+57)

Morbidity Due to Viral Hepatitis and Means of Improving the Prevention of Such Infections Among the USSR Population

18400545E Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 2, Feb 89 (manuscript received 13 Jun 88) pp 49-55

[Article by M. I. Narkevich, G. G. Onishchenko, I. V. Shakhgildyan, V. A. Ananyev, P. A. Khukhlovich, I. K. Nemynova, E. I. Schastnyy, N. A. Farber and M. O. Favorov, USSR Ministry of Health; Institute of Virology imeni D. I. Ivanovskiy, USSR Academy of Medical Sciences, Moscow]

[Abstract] In recent years the incidence of viral hepatitis (VH) in the USSR has continued to remain at a high level despite a slight downward trend (336.9 cases/100,000 in 1985, and 300.8 in 1987). In addition, there is considerable regional variation in the morbidity patterns, with the incidence in Central Asia exceeding the national average by 2.5- to 4.5-fold. In 1987, for example, the highest incidence was reported for Uzbekistan, where the number of cases reached 1450.9/100,000. The lowest incidence has been reported for the Baltic republics, with Estonia reporting a case figure of 96.2/100,000, and Moscow (78.2/100,000). On an overall basis the official statistics indicate that in the 1985-1987 period 90.3-86.3% of the VH cases consisted of hepatitis A and 9.7-13.7% were represented by hepatitis B. (The figures do not, however, reflect the true etiological structure of VH, the authors suggest.) The economic losses sustained by the Soviet economy as a result of VH have been estimated to be 628.8 million rubles in 1987, of which 204.3 million rubles has been attributed to the Uzbek SSR. Further complications in the hepatitis picture have been introduced by the appreciation that non-A,non-B hepatitis is gaining in importance in Central Asia and that the fecal-oral route is the predominant route of transmission due to poor sanitary conditions. Hepatitis B presents a special problem and accounts for most of the VH mortality, especially in combination with delta hepatitis. The data indicate quite clearly that a concerted effort has to be made to control VH in the USSR. This has to include close screening of blood products, health education, monitoring of carriers, and improvements in general sanitary conditions. Figures 6; references 12 (Russian).

UDC 616.34-022.7-036.11-084:313.13

Morbidity and Prevention Associated With Acute Intestinal Infections in USSR

18400545F Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 2, Feb 89 (manuscript received 13 Jul 88) pp 55-60

[Article by M. I. Narkevich, G. G. Onishchenko, Yu. P. Solodovnikov, V. I. Kolesnichenko and S. S. Chikova, Central Scientific Research Institute of Epidemiology, USSR Ministry of Health, Moscow]

[Abstract] The incidence of bacterial intestinal infections in the USSR continues to remain high, with the highest statistics in 1987 reported for the Tajik SSR (1069.0/100,000) and the RSFSR (768.4/100,000), with an average of 609.0 cases per 100,000 for the USSR. The attendant losses to the Soviet economy were represented in 1987 by 130 million rubles due to dysentery, 25.6 million rubles due to salmonellosis, and 8.6 million rubles due to typhoid fever. The problem can be traced to the poor sanitary conditions in the food industry and problems with water supply in the USSR. Rigorous measures will have to be exercised to correct these persistent problems, in conjunction with health education for the populace. Figures 3.

UDC 614.777+613.32]:546.175]-07:612.017.1-053.2

Immune Status of Children in Areas with Elevated Nitrate Levels in Drinking Water

18400548A Moscow GIGIYENA I SANITARIYA in Russian No 3, Mar 89 (manuscript received 21 Jan 88) pp 19-22

[Article by A. S. Kozlyuk, G. V. Kushnir, L. A. Anisimova, I. G. Shroyt and N. I. Opopol, Moldavian Scientific Research institute of Hygiene and Epidemiology, Kishinev]

[Abstract] A comparative analysis was conducted on the immune status of 110 healthy children, 9-12 years old, in two areas differing in nitrate levels in the drinking water. In one area (area I) the levels of nitrates in the artesian waters and well waters were 2.2 and 37.4 mg/L, respectively, and in the other (II) the corresponding figures were 81.5 and 176 mg/L. In area I the data obtained for the status of cellular and humoral immunity were on par with control data. However, in area II approximately 40% of the children presented with T-cell lymphopenia and 44.4% with B-lymphopenia. In addition, depression of IgA levels was noted in 52.9% of the children, of IgM in 42.3%, and of IgG in 59.6%. Furthermore, elevated levels of IgE were detected in 85% of the children in area II; in 48% of the children two or three classes of immunoglobulins were depressed simultaneously. These findings demonstrated that in areas with high concentrations of nitrates in the drinking water hypersensitization and depression of the immune system appear to be potential pediatric health risk factors. References 13 (Russian).

UDC 616-005.1-08:538.56

Status of Vascular Element of Hemostasis System in Long-Term Exposure to Microwaves

18402089A Baku AZERBAYDJANSKIY MEDITSINSKIY ZHURNAL in Russian No 1, Jan 89 pp 18-20

[Article by V. K. Parfenyuk, Azerbaijan State Medical Institute imeni N. Narimanov]

[Abstract] A study was made of specific features of the vascular component of hemostasis in persons exposed to microwaves over long periods of time. The studies were

performed on 40 individuals who were aged 25 to 45 and who worked in areas with exposure to low-intensity microwaves, plus 45 control subjects with no exposure to electromagnatic fields. More than 90% of the individuals in the main group were under 40 and had been on the job five years or more. The levels of electromagnetic radiation in the workplace did not exceed the maximum allowable level. In 25% of the individual of that group, there were no health complaints, but mild autonomic nervous system disorders were noted. Autonomic-vascular dysfunction was noted in 55%, with asthenoautonomic syndrome noted in the remaining 45%. Biomicroscopy of the bulboconjunctival vessels was performed with a slit lamp to assess the morphological condition of the vascular component of the system for regulating the aggregate condition of the blood. A capillary-venous method was used to determine the vascular permeability, capillary resistance was determined, and the thrombocyte level was measured. Deviations in microcirculation were observed in the subjects who had been in contact with microwaves, with changes in all elements of the microcirculatory bed, particularly the venous segment. Aneurismal expansion was detected in venules and capillaries, with uneven variation of arteriole lumens. Mild hemorrhaging was noted quite often along the course of conjunctival vessels. Erythrocyte aggregation was noted in venules. Arteriole-venule coefficient was reduced. After hydrostatic load, there was a reliable difference between the increase in vascular permeability in persons with over 10 years exposure to microwaves and the control group of the same age. No reliable difference in capillary resistance was observed. There was a decrease in thrombocytes levels in persons with over 10 years exposure. The results indicate disruptions of vascular architectonics, perivascular changes and a decrease in the adaptive capabilities of the permeability and capillary resistance functions. References 5 (Russian).

UDC 616.98:578.8]-092:612.017.1]-021.5-07

Basic Approaches and Methods of Laboratory Identification of Infection by Human Immunodeficiency Virus

18402089B Baku AZERBAYDJANSKIY MEDITSINSKIY ZHURNAL in Russian No 1, Jan 89 pp 68-73

[Article by M. K. Mamedov, N. O. Gudratov, N. T. Garbov, Republic Oncologic Science Center, Azerbaijan Ministry of Health; Republic Blood Transfusion Station, Azerbaijan Ministry of Health]

[Abstract] The great variety of clinical manifestations of AIDS makes laboratory diagnosis particularly important. The most promising screening method is the enzyme-linked immunosorbent assay, or ELISA, which enables determination not only of ag-HIV and anti-HIV, but also antibodies relating to various immunoglobulins. The ELISA offers distinct advantages over another test—an RIA known as the immunoradiometric assay, or IRMA—in that it enables preliminary visual assessment of test results, does not require expensive radiometric equipment, and does not endanger the environment with radioactive contamination. The Western blotting test can distinguish between anti-HIV Core and anti-HIV Env, yielding very specific results. However, the test is complex. AIDS screening should utilize simpler and more accessible tests to avoid excess cost in time and money, while retaining good screening effectiveness of persons with HIV infections. Figure 1; References 19: 10 Russian, 9 Western.

UDC 599.363:591.67

Soricidae as Hosts for Human Bacterial Zoonotic Disease Pathogens

18402112 Moscow ZOOLOGICHESKIY ZHURNAL in Russian Vol 68 No 3, 89 pp 89-98

[Article by L. A. Khlyap, Scientific Research Institute of Epidemiology and Microbiology, USSR Academy of Medical Sciences, Moscow]

[Abstract] This literature survey discusses reports of transmission of various human disease pathogens by Soricidae (shrews). Reports are discussed involving 20 species of shrews from the Sorex, Suncus, Crocidura, and Blarina genera and two species from Neomys. These reports, indicating that shrews have been involved in transmission of pathogens and that shrews can be found in human habitations, indicate that their role in epizootics can be quite great. Shrews are involved in the epizootiology of many leptospiroses and of tularemia, pseudotuberculosis, pasteurellosis, and erysipelothrix infection. However, present reports do not demonstrate that shrews are involved in constant circulation of infection in natural foci. References 61: 53 Russian, 8 Western.

UDC 616-007.1-053.1-036.2-07

Evaluation of Prevalence of Congenital Developmental Abnormalities in Newborns From An Analysis of Archival Documents

18400548B Moscow GIGIYENA I SANITARIYA in Russian No 3, Mar 89 (manuscript received 10 Jul 87) pp 38-41

[Article by I. V. Nikolayeva, I. N. Lunga and V. V. Viktorova, Institute of Medical Genetics, USSR Ministry of Health, Moscow]

[Abstract] Case histories were analyzed at Nos. 2 and 7 Obstetrical Centers in the Kiyevskiy Rayon of Moscow for the period 1979-1984 to determine the incidence of congenital abnormalities. The total number of neonates whose case histories were analyzed came to 35,977. The incidence of abnormalities at one center was 21.15% and at the other 30.94%. The abnormalities were further subdivided into class A abnormalities (visually self-evident), class B (requiring special diagnostic effort for detection during the neonatal period), and class C (unapparent in early neonatal period). Class A was found to represent 25.6% of all the cases, class B 13.8%, and class C 60.6%. On an overall basis, more than 50% of the malformations involved the face, neck, musculoskeletal system, and the sex organs and accounted for 98.8% of the abnormalities in class C. The percentage of multiple malformations was 2.25%, with 93.8% falling into class A. These observations demonstrated that use of archival case histories, including autopsy data, provides a valid approach to assessment of the incidence of congenital abnormalities. Furthermore, determination of class A abnormalities has been shown to reflect the incidence of chromosomal abnormalties in view of their implication in multiple abnormalities. References 13: 3 Russian, 10 Western.

UDC 575.113:579.852

Expression of Chloramphenicol Acetyltransferase Gene of Bacillus Pumilus in Bacillus Subtilis from Phage λ p_R promoter

18400563C Moscow GENETIKA in Russian Vol 25 No 3, Mar 89 (manuscript received 25 Nov 87; in final form 20 May 88) pp 555-556

[Article by Ye. V. Lukyanov, M. L. Chikindas, A. I. Stepanov, All-Union Scientific Research Institute of Biotechnology, Moscow; All-Union Scientific Research Institute of Applied Microbiology, Moscow Oblast]

[Abstract] Bacillus genus microorganisms have long been successfully used in microbiological production as producers of biologically active substances. Producing strains based on bacillus have been created using gene-engineering approaches. There is, however, the problem of overcoming the barrier to expression of genetic material of gram-negative microorganisms in gram-positive cells. This article studies the possibility of expressing the chloramphenicol-acetyltransferase gene of B. Pumilus of the plasmid pPL703 from the phage λ p_R promoter. The initial material used was the plasmid pPL703, which contains the cat gene without a promoter but has its own RBs, and pBM21 with p_R promoter beyond which the site BglII is located. The results indicate the possibility of transcription of genes from gram-negative bacterial promoters in the cells of B. subtilis, but effective expression of genetic material in bacilli is possible only when bacillary RBS is present. Figure 1; References 4: 1 Russian, 3 Western.

UDC 616.98:579.841.95]-092:612.017.1]06:616-056.43-07

Delayed Hypersenstivity in Pathogenesis and Immunity in Tularemia in Mice

18400545G Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 2, Feb 89 (manuscript received 31 Aug 87) pp 86-92

[Article by M. S. Gordeyeva and R. A. Savelyeva, scientific Research Institute of Epidemiology and Microbiology imeni N. F. Gamaleya, USSR Academy of Medical Sciences, Moscow]

[Abstract] An assessment was performed on delayed hypersensitivity and lypmhocyte migration in the pathogenesis of tularemia in two lines of mice known to differ in susceptibility to Francisella tularensis. The results showed that subcutaneous or intracutaneous injection of the mice with ten bacterial cells resulted in an 80% mortality in the CBA mice and a 20% mortality in the BALB/c mice. Histopathologic, bacteriologic, and immune assessent of both types of animals demonstrated that the more resistant BALB/c mice responded with a more vigorous cellular immune response than the more susceptible CBA mice. The BALB/c mice presented with greater hyperplasia of the regional lymph nodes at the site of bacterial injection and a significant increase in lymph node content of T-dependent cells. Lymphocytic infiltrates of the spleen, liver, and the lungs were also much more pronounced in the BALB/c mice and were of considerably longer duration than in the CBA mice. Whereas in the CBA mice lymphocyte migration had almost ceased within 5-6 days (at the height of the infection), migration continued for 12 days in the BALB/c mice. Testing at 14 and 30 days demonstrated that delayed hypersensitivity was 1.5- to 2-fold more intense in the BALB/c mice, and abated much more rapidly in the CBA mice. These observations pointed to the importance of cellular immunity in the outcome and pathogenesis of tularemia in mice. Figures 6; references 15: 7 Russian, 8 Western.

UDC 615.371:578.833.26].015.46.076.9

Immune Response in Mice Immunized with Inactivated Lassa Virus

18400573H Moscow VOPROSY VIRUSOLOGII in Russian Vol 34 No 2, Mar-Apr 89 (manuscript received 19 Jan 89) pp 213-216

[Article by G. M. Ignatyev, V. P. Golubev, A. T. Godneva, A. S. Petkevich, A. V. Torop, N. N. Lemeshko, I. S. Lukashevich and V. P. Rytik, Belorussian Scientific Research of Epidemiology and Microbiology, Belorussian SSR Ministry of Health, Minsk]

[Abstract] An analysis was conducted on the nonspecific (NK cell and interferon) and specific immune factors in the immune response to gamma radiation-inactivated Lassa virus in 14-18 g CBA mice. The study revealed that within the first 14 days of infection titers of NK cells and interferon show a modest rise and may offer some immune protection in that period of time against infection with a homologous virus. At that time titers of specific antibody were low, with neutralization indices of 0.8 and 1.1 log on days 7 and 14, respectively. The greatest degree of immune protection was shown to be due to the appearance of immunocompetent cells by day 14, the transfer of which to syngeneic recipients offered virtually complete immunity ($p < 0.01$). However, there was no correlation between the appearance of these cells and the blast response with the Lassa virus. References 20: 9 Russian. 11 Western.

UDC 591.443.147.8

Functional and Morphological Characteristics of Mesenteric Lymph Nodes of Rats Administered Synthetic Metal-Containing Polyelectrolytes

18402113B Tashkent UZBEKSKIY BIOLOGICHESKIY ZHURNAL in Russian No 1, 1989 (manuscript received 26 Dec 87) pp 65-67

[Article by A. R. Sirota, A. M. Nazhmitdinov and M. G. Kadyrova, Institute of Immunology Branch, USSR Ministry of Health]

[Abstract] Screening for novel immunomodulators led to the assessment of the histologic effects of metal complexes of acrylic acid-N-vinylpyrrolidine copolymers on the mesenteric lymph nodes of 160-180 g outbred female rats. The copper, cobalt, or zinc complexes were administered intraperitoneally in a dose of 50 mg/kg, and the lymph nodes examined 24 h later. The general observations were that the complexes activated proliferation and differentiation of lymphocytes and stimulated an increase in the percentage of macrophages in mitosis in the cortical and medullary compartments. In addition, while the copolymer itself led to a reduction in the number of plasma cells, the copper and zinc complexes had the opposite effect on this class of cells. References 5 (Russian).

UDC 614.718-078

Biomedical Criteria for Evaluating Air Quality in Vicinity of Microbial Synthesis Plants

18400548C Moscow GIGIYENA I SANITARIYA in Russian No 3, Mar 89 (manuscript received 30 Jul 87) pp 53-54

[Article by S. A. Pogorelskaya, N. V. Mokeyeva, A. V. Litovskaya, P. A. Chebotarev and A. Yu. Bundakov, Scientific Research Institute of Labor Hygiene and Occupational Diseases, Gorkiy]

[Abstract] Air samples obtained by means of filter traps at distances of 0.5-10 km from a plant involved in the production of fungal single-cell protein were analyzed to determine potential health risk factors. In addition, the upper respiratory tracts of 345 adults and 369 children were examined for colonization by the fungus employed at the plant, and hypersensitivity studies were performed. The data showed that the plant did not present a risk factor, because of the safety precautions followed at the plant to prevent escape of the industrial microorganisms and their products into the environment. References 4: 3 Russian, 1 Western.

UDC 615.285.7.017:615.282].015.4

Nature of Biological Action of the Mycoinsecticide Entomophthorin

18400548D Moscow GIGIYENA I SANITARIYA in Russian No 3, Mar 89 (manuscript received 27 May 88) pp 76-77

[Article by D. R. Sprudzha, V. N. Slinko, A. N. Ustinenko and L. N. Kalinina, Riga Medical Institute]

[Abstract] Safety testing was conducted with a novel biological insecticide prepared from the fungus Entomophthora thaxteriana E-68 to assess its effects on the mammalian organism. The preparation, designated entomophthorin, consists of 2.5×10^7 to 5×10^7 spores/g dry mass. Trials on a number of animals with administration by various routes demonstrated that the insecticide was moderately toxic, irritating, allergenic, and immunosuppressive. In the case of outbred rats administration of 20 mg/m^3 entomophthorin affected embryogenesis, resulting in a significant increase in postimplantation mortality and fetal hypotrophy. Based on these studies, entomophothorin was classified as a class 2 toxin. References 2 (Russian).

UDC 615.849.19.015.4:612,912.1:577.152.2].07

Reactivation of Superoxide Dismutase by Helium-Neon Laser Red Light

18400575D Moscow BYULLETEN EKSPERIMENTALNOY BIOLOGII I MEDITSINY in Russian Vol 107 No 3, Mar 89 (manuscript received 5 Mar 88) pp 302-305

[Article by Ye. A. Gorbatenkova, Yu. A. Vladimirov, N. V. Paramonov and O. A. Azizova, Scientific Research Institute of Physicochemical Institute, RSFSR Ministry of Health, Moscow]

[Abstract] In view the fact that superoxide dismutase (SOD) absorbs in the 632.8 nm bandwidth, the emission band of helium-neon laser, a study was conducted to determine whether the red light emitted by such a laser would reactivate acid-inactivated SOD. SOD was shown to lose 98% of its activity after 2 h in 10 mM tris-HCl, pH 5.9. Laser action (LG-78, 2 mW, defocused 3 mm diameter beam) for 45 sec led to recovery of 94% of the initial baseline activity. The changes in SOD ESR spectra induced by laser action were analogous to those induced in a model copper-histidine complex under controlled conditions. The absorption and ESR data suggest that the effects of helium-neon laser action on SOD are due to deprotonation of the his-61 residue on the enzyme and reconstitution of an imidazole bridge between copper and zinc atoms in the active site that had been destroyed at low pH due to protonation of his-61. It well may be that the beneficial effects of helium-neon laser in inflmmatory conditions are due to an analogous mechanism. Figures 2; tables 1; references 15: 7 Russian, 8 Western.

UDC 616.74-001.28-053.9-085.849.19-036.8-07:616.74-003.93]-092.9

Effects of Helium-Neon Laser Action on Postradiation Recovery of Skeletal Muscles in Old Rats

18400575F Moscow BYULLETEN EKSPERIMENTALNOY BIOLOGII I MEDITSINY in Russian Vol 107 No 3, Mar 89 (manuscript received 6 May 88) pp 345-347

[Article by N. V. Bulyakova, Evolutionary Histology Group, Institute of Evolutionary Morphology and Ecology of Animals imeni A. N. Severtsov, USSR Academy of Sciences, Moscow]

[Abstract] X-irradiation (20 Gy) of a posterior extremity of 24-30 month odl rats, followed by resection of the gastrocnemius muscle, served as a model system designed to evaluate the effects of helium-neon laser action on the recovery process. Laser action was applied for one month after irradiation under the following conditions: 6-9 treatment , 2.5-3 mW/cm^2, 2 mm diameter defocused beam, continuous 3 min exposure or 60 3 sec pulses at 7 sec intervals. Histologic and morphometric studies demonstrated that laser action was without any essential effect on the muscle tissue. However, laser action accelerated fibrin resorption and stimulated connective tissue formation. In addition, laser pulses were seen to exert a favorable effect on skin healing and prevented the development musculocutaneus ulceration. Figures 3; tables 1; references 14: 13 Russian, 1 Western.

UDC 616.831-005-085.849.19-036.8-07:616.155.2-008.1

Influence of Low-Energy Laser Radiation on Aggregation of Thrombycytes in Cerebrovascular Disease

18402110 Moscow SOVETSKAYA MEDITSINA in Russian No 3, Mar 89 (manuscript received 28 Jan 88) pp 77-80

[Article by I. A. Steblyokova, N. B. Khayretdinova, A. M. Belov, N. A. Kakitelashvili, Chair of Clinical Pharmacology, First Moscow Medical Institute imeni I. M. Sechenov]

[Abstract] A study is made of the aggregation of thrombocytes in intravenous laser therapy used for the first time in patients with acute ischemic insult and chronic cerebrovascular insufficiency. Studies were performed on 30 males and 29 females averaging 51 years of age. Intravenous laser therapy was used in 39 cases, including 14 with acute ischemic cerebrocirculatory disorder and 25 with chronic cerebrovascular insufficiency. The control group received normal pharmocotherapy. The intravenous laser therapy was effective in the treatment of vascular diseases of the brain, one of its mechanisms of action being its modulating effect on the functional activity of thrombocytes. The laser affects erythrocyte bioenergetics, which is confirmed by a shift of the oxyhemoglobin dissociation curve to the right and a reduction in oxygen affinity with hemoglobin. The absence of marked clinical improvement in five patients who showed positive shifts in thrombocyte aggregation and p_{50} indicates that normalization of those indices is not always a determinant in the clinical course of cerebrovascular disease. The researchers conclude that low-energy laser radiation is effective in patients with acute cerebral circulatory disorders and chronic cerebrovascular insufficiency and that intravenous laser therapy's modulating effect on the aggregation of thrombocytes helps to improve tissue oxygenation. References 19: 14 Russian, 5 Western.

UDC 616.9-07:616.153.915-074:543.544:681.31

Computer Diagnosis of Infectious Diseases From Gas Chromatographic Profiles of Serum Lipids

18400507 Moscow VOPROSY MEDITSINSKOY KHIMII in Russian Vol 35 No 2, Mar-Apr 89 (manuscript received 25 Jan 88) pp 115-120

[Article by A. S. Mirimskiy, O. G. Milova, I. M. Roslyy, Yu. Ya. Vengerov, T. N. Yermak, L. G. Koyudenko, L. V. Degtyareva, B. M. Sidakov and L. F. Linberg, Central Scientific Research Institute of Epidemiology, USSR Ministry of Health, Moscow]

[Abstract] Trials were conducted with the use of gas chromatographic profiles of serum lipids for the diagnosis of infectious diseases to ascertain the utility of metabolic profiles in such conditions. Data derived for 37 healthy subjects were compared with the profiles derived for 16 patients with hepatitis A or B, 19 with purulent meningitis, 30 with dysentery, and 9 with salmonellosis. Computer analysis of the profiles for the healthy subjects revealed definite patterns consisting of groups of compact clusters of peaks, differentiated as to age, sex, genetic factors, etc. The healthy profiles showed distinct differences from those obtained for the patients, and the computer made reliable differentiations. The reliability of the analyses and the resultant diagnoses improved with the size of the baseline databank used for comparison. Under the current operating conditions the reliability of diagnosis of the viral hepatitis was 100%. In general, the size of database currently available for comparison makes it possible to differentiate between healthy individuals and patients with meningitis and intestinal infections with respective certainties of 92%, 74%, and 85%. Figures 1; references 13: 4 Russian, 9 Western.

Commission Finds Perftoran Has No Clinical Value

18400579 Moscow SOVETSKAYA ROSSIYA in Russian 23 Jun 89 p 3

[Article by the Department of Science and Educational Institutions of SOVETSKAYA ROSSIYA, under the rubric "Once More About 'Blue Blood'": "Truth Is Dearer Than Sensation"]

[Abstract] The new blood substitute Perftoran, known in the press as "blue blood," has received extensive publicity. Reports have stated that patients have been saved by Perftoran after all other medications failed. The facts are otherwise: one out of three who received "blue blood" died. This was not reported by the inventors of the substance or the doctors using it. Only scrupulous investigation has revealed this fact, following careful examination of clinic and hospital files. One doctor, in his reports, even falsely doubled the number of persons receiving the preparation and halved the number who died during its use. It is impossible to determine the true effect of Perftoran. A USSR Academy of Sciences bureau of the department of biochemistry, biophysics, and chemistry of biologically active compounds has stated that "the work done at the USSR Academy of Sciences Institute of Biological Physics in the study of perfluorocarbon emulsions has not solved the problem of replenishing massive blood loss." A commission was set up to study the issue, and its members consist of representatives from the USSR Academy of Sciences, the USSR Academy of Medical Sciences, the USSR Ministry of Health, and the USSR Ministry of Medical and Microbiological Industry. The commission concluded that domestic medical perfluorocarbons such as Perftoran and Perfukol and foreign perfluorocarbons such as Fluosol DA have serious drawbacks by comparison with donor blood or erythrocytes and that no such blood substitutes are advanced enough for clinical testing. Retrospective analysis of clinical reports indicates that there is no proven observation in which emulsions of this type have been clinically effective.

UDC 616.98:578.833.29]-06:616.61-008.64-036.11]-06:616.152-092-07:[616.154:577.175.343

Pathogenesis of Water-Electrolyte Imbalances in Acute Renal Insufficiency in Patients with Hemorrhagic Fever and Renal Syndrome

18402034 Mosow KLINICHESKAYA MEDITSINA in Russian No 2, Feb 89 (manuscript received 31 May 88) pp 44-48

[Article by B. F. Bystrovskiy, Faculty Chair of Therapeutics, Khabarovsk Medical Institute]

[Abstract] Conventional blood chemistries were evaluated for a cohort of 163 male and female patients, 17 to 59 years of age, suffering from hemorrhagic fever and renal syndrome, in order to evaluate the pathogenetic mechanisms of renal insufficiency. In the period of acute renal insufficiency plasma vasopressin showed elevation to a mean value of 36.2 pmoles/L during the preoliguric phase (6.3 pmoles/L control value), a decrease to 10.8 pmoles/L during oliguria, a secondary phase of elevation to 16.0 pmoles/L during polyuria, and 9.8 pmoles/L with recovery to normal diuretic pattern. The corresponding plasma aldosterone levels (42 pmoles/L control) during these stages of acute renal insufficiency were 0.51, 0.72, 0.24, and 0.45 pmoles/L. Concomitantly, maximum plasma renin activity was observed during oliguria. Plasma osmolality (280 mOsm/L control value) during the corresponding stages of acute renal insufficiency varied to 290, 306, 305, and 285 mOsm/L. Correlation analysis between plasma sodium concentration during polyuria and the outcome revealed a direct relationship. Hypernatremia during that stage of acute renal insufficiency indicated a poor prognosis: a sodium level above 155 mmoles/L carried a better than 85% probability of death. Changes observed in the levels of vasopressin and aldosterone represented an attempt at correction of body fluid imbalances and reflected the fact that endocrine function remained normal. However, hypernatremia in

cases with a lethal outcome reflected lack of responsiveness of the renal apparatus to vasopressin. In addition, the discovery of necrosis in the pituitary gland on postmortems suggests that vasopressin deficiency may be a factor in the pathogenesis of hypernatremia. References 9: 7 Russian, 2 Western.

UDC 616-001.4-003.9:615.31+547.962.9

Effects of Collagen-Dalargin Complex on Wound Healing

18402065 Minsk ZDRAVOOKHRANENIYE BELORUSSII in Russian No 2, Feb 89 (manuscript received 24 May 88) pp 36-39

[Article by S. Ye. Spevak, G. Ya. Khulup, A. B. Shekhter, A. M. Shapiro, A. I. Solovyeva, L. P. Istranov and M. N. Danyushchenkova, All-Union Cardiological Scientific Center, USSR Academy of Medical Sciences; Vitebsk Medical Institute; 1st Moscow Medical Institute imeni M. I. Sechenov]

[Abstract] Male Wistar rats (200-220 g) with full-thickness skin wounds were used in a study designed to assess the effects of a collagen-dalargin (CD) complex on wound healing. The complex was prepared from acetic acid extracts of bovine collagen in a the form of a collagen sponge. Two versions of the complex were employed: a collagen-dalargin-quinoxidine (CDQ) complex and a CD complex, both containing 400 μg dalargin per one gram of the protein. The conventional and spongiform dressings were applied once a day for ten days, with the results monitored histologically. The data demonstrated that complete healing with conventional treatment required an average of 30.1 days. Complete healing with the CD complex was seen in 24.8 days and with the CDQ Complex in 22.1 days. The accelerated healing was shown to be due to dalargin, which activated connective tissue formation, angiogenesis, and epithelialization. Finally, dalargin was also felt to contribute to detoxification through activation of macrophages and elimination of neutrophilic infiltration by day 10. Figures 6; references 15: 10 Russian, 5 Western.

UDC 616.22-018.73-074:543.42

Laser-Endoscopic Spectral Analysis in Laryngology

18402068B Moscow VESTNIK OTORINOLARINGOLOGII in Russian No 2, Mar-Apr 89 (Manuscript received 10 Apr 88) pp 44-46

[Article by N. A. Preobrazhenskiy, A. V. Babin, V. B. Loshchenov, S. N. Korablin, A D. Ronzin, Department of Otorhinolaryngology, First Moscow Medical Institute imeni I. M. Sechenov]

[Abstract] Optical and spectroscopic methods can be used to determine the degree of oxygenation of the capillary blood of mucous membranes, the quantity of blood present and respiratory status of mucous membrane cells. Multichannel analyzers, developed in recent years, allow simultaneous recording of the spectrum throughout an entire range of wavelengths, permitting reliable recording of the spectral characteristics of the mucous lining of internal organs by contactless methods. A laser-endoscopic spectral analyzer has been developed jointly by the All-Union Scientific Research Institute of Optical Physical Measurements and the First Moscow Medical Institute. It was tested on 35 patients, demonstrating its ability in the examination of neoplasms and studies of the status of the mucous lining of the throat by recording luminescence and reflected spectra. Figures 3; References 6: 2 Russian, 4 Western.

UDC 616.28-008.14-079

Microcomputer-Based Automation of Mass Screening for Hypoaucusis

18402077C Kiev ZHURNAL USHNYKH, NOSOVYKH I GORLOVYKH BOLEZNEY in Russian Vol 2, 89 (manuscript received 25 May 88) pp 81-83

[Article by S. L. Rudnitskiy, Oblast Surdiaudiological Center, Saratov Oblast Department of Health]

[Abstract] The trend to an increase in various forms of hypoaucusis has made it necessary to improve the efficiency of mass screening programs for this condition by the introduction of computers into the process. Data maintenance and retrieval can easily be accomplished with several Soviet microcomputers, such as Elektronika-60, DVK-2M, MS-05-85, and others with 64K RAM. At the Saratov center use is made of the DVK-2M microcomputer for patient monitoring and creation of data banks, a step that has eliminated manual card files and promoted greater efficiency. However, the introduction of microcomputers into the medical setting has made it necessary to establish an automation office for equipment and program management, and for conducting feasibility studies on medical applications. References 12 (Russian).

UDC 616.94-08:[615.849.19+615.15:541.183]

Sorption Methods and Laser Irradiation in the Treatment of Pyroseptic Diseases

18402103 Leningrad VESTNIK KHIRURGII IMENI I. I. GREKOVA in Russian Vol 142 No 3, Mar 89 (manuscript received 18 Oct 88) pp 12-16

[Article by I. K. Dedenko, M. P. Zakharash, V. I. Trunov and V. V. Zhirnov, Kiev]

[Abstract] Treatment of infected, purulent wounds by the application of absorptive fibrous or granular (SKN) sorbents alone and in combination with helium-neon laser action (0.633 nm, 1-1.5 mW/cm^2, 2 min/field/day, 6-7 sessions) was employed in the case of 270 patients' lesions on the lower extremities, trunk, and neck. Evaluation of the results showed that combined therapy accelerated healing 1.94-fold by comparison with patients managed conventionally. The combination was particularly effective in controlling edema, normalization

of exudate pH, and in enhancing phagocytic activity of infiltrate cells. In addition, hemabsorption was employed as an adjunct treatment modality in 33 patients with peritonitis. The mortality rate for the patients managed with hemabsorption was 9.1%; the patient group that was not treated with hemabsorption had a mortality rate of 31.4%. The benefical effects of hemabsorption were attributed to the elimination of partially oxidized metabolites and normalization of the kallikein-kinin system.

UDC 616-001.17-08

Organosilicon Absorbent in Topical Burn Treatment

18402105AKiev KLINICHESKAYA KHIRURGIYA in Russian No 3, 89 (manuscript received 12 Dec 88) pp 25-27

[Article by G. P. Kozinets, I. M. Samodumova, A. F. Gribovod (dec), T. V. Sosyura, V. M. Lositskaya, L. I. Kiseleva, L. N. Prikhodko, I. I. Galaychuk, V. P. Tsygankov and N. K. Skachkova, Kiev Scientific Research Institute of Hematology and Blood Transfusion and Kiev State Institute of Postgraduate Medicine, Ukrainian SSR Ministry of Health, Kiev; Institute of Physical Chemistry, Ukrainian SSR Academy of Sciences]

[Abstract] Clinical trials were conducted to assess the efficacy of a polymethylsiloxane (PMS) absorbent in the topical management of burns. The patient cohort consisted of 57 male and female patients, 16 to 60 years old, with 2nd to 3rd degree burns over 10 to 50% of the body surface. Comparative control data were derived from 20 patients managed in the conventional manner. PMS powder (0.1-0.25 mm diameter granules) was applied to a 1-3 mm thickness after initial debridement, covered by a dressing, and changed once or twice daily. In the experimental patients epithelialization was observed within 4-5 days and healing was complete in 12-17 days. Hospitalization of the experimental was shorter by an average of 6.8 days than of the control subjects. Histologic and biochemical monitoring of the exduate showed that PMS enhanced phagocytic activity of the leucocytes in the exudates in comparison with the activity in the control patients, and depressed acid and neutral protease activities vis-a-vis the control values. In addition, PMS was effective in reducing the areas sevre and extremely severe burns by 30-40%. References 1 (Russian).

UDC 616-001.17-06

Changes in Body Composition and Classification of Lipid/Protein Deficiency in Burn Patients

18402105B Kiev KLINICHESKAYA KHIRURGIYA in Russian No 3, 89 (manuscript received 3 Aug 88) pp 27-31

[Article by G. A. Isayev, G. Ye. Sokolovich and Ye. V. Gavrilin, Chair of Military Field Surgery, Military Medical Faculty, Tomsk Medical Institute]

[Abstract] In order to obtained prognostic parameters and indicators for metabolic therapy, an assessment was conducted on fat reserves (FR), lean body mass (LBM), and body weight (BW) in 124 male and female patients with various burns covering 5 to 80% of the body surface area. On the basis of the observations and clinical studies the data demonstrated that burn patients may be classified into six categories with increasingly poor prognosis. One group (Compensated) consisted of patients in a state of physiological compensation characterized by the following parameters: 1st to 2nd degree burns (5-15% body area), Frank index = 5-15 U, less than 3% loss of BW and LBM, and less than 5% loss of FR. The Uncompensated group was represented by patients with 2nd to 3rd degree burns (less than 10 to 30%), Frank index = 15-60 U, 3-15% loss of BW, 5-25% loss of FR, and 3-10% loss of LBM. The Reversibly Decompensated patients had 3rd degree burns (11-35%), Frank index = 60-130 U, 15-15% loss of BW, 25-40% loss of FR, and 10-20% loss of LBM. Finally, the patients with the poorest prognosis were classified as Irreversibly Decompensated, characterized by 3rd to 4th degree burns over 15-50% of the body surface, a Frank index = 90-150, and a greater than 25% loss of BW, more than 40% loss of the FR. and over a 20% decrease in the LBM. The classification was found useful in designing appropriate enteral and parenteral nutritional support, and in the evaluation of efficacy of nutritional therapy. Figures 4; tables 1; references 3 (Russian).

UDC 616-001.17+576.8.097.3

Specific Immunity in Patients with Severe Burns Complicated by Pseudomonas Aeruginosa Infection

18402105C Kiev KLINICHESKAYA KHIRURGIYA in Russian No 3, 89 (manuscript received 3 Nov 87) pp 35-37

[Article by Ye. A. Fedorovskaya and L. V. Nazarchuk, Kiev Scientific Research Institute of Hematology and Blood Transfusion, Ukrainian SSR Ministry of Health]

[Abstract] An analysis was conducted on 500 serum samples obtained from burn patients whose condition was complicated by Pseudomonas aeruginosa infections to assess the status of specific immunity and sensitization to the pathogen. The cohort was represented by 262 patients, 17 to 70 years of age, including individuals in the convalescent phase, who had sustained burns varying in severity and location. The results demonstrated that all of the patients were sensitive to Ps. aeruginosa allergens and possessed serum antibodies against this pathogen. However, high antibody titers—1:80 or greater—were detected only 2-3 weeks after lesion had been sustained, and then in only 22% of the patients and, after 6-9 months, in 37.9% of the convalescents. Consequently, this study demonstrated that despite the development of sensitivity to Ps. aeruginosa, a specific immune response was weak and slow in development, a factor to be considered in the managment of burn patients. Tables 2; references 4 (Russian).

UDC 616-022.7

Susceptibility of Pseudomonas Aeruginosa to Iodopyrone and Dimexide, Based on Evidence of Electron Microscopy

18402106C Kiev KLINICHESKAYA KHIRURGIYA in Russian No 3, 89 (manuscript received 13 Dec 88) pp 48-49

[Article by P. P. Litovchenko, V. A. Znamenskiy and N. V. Dekhtyar, Kiev Scientific Research Institute of Hematology and Blood Transfusion and the Kiev State Institute of Postgraduate Medicine, Ukrainian SSR Ministry Health]

[Abstract] Electron microscopy was employed in assessing the susceptibility of Ps. aeruginosa to idopyrone, dimexide, and the combination of the two agents. The ultrastructural studies demonstrated that both 93.75 mg/ml iodopyrone (0.5% active iodine) and 10% dimexide induced cell damage after 1 h of incubation and that the iodopyrone + dimexide combination evidenced a synergistic effect in terms of cell damage and inhibition of multiplication. These findings suggest that therapeutic trials need to be conducted with this combination in the management of burn patients. References 1 (Russian).

UDC 616-001.17-06-08

Heparin Responsive in Patients with Thermal Burn Toxemia in Extracorporeal Detoxication

18402106A Kiev KLINICHESKAYA KHIRURGIYA in Russian No 3, 89 (manuscript received 11 Apr 88) pp 37-39

[Article by A. Yu. Kholodov, B. M. Valdman, R. N. Lifshits, A. S. Puzhevskiy and A. G. Malimov, Chair of Biochemistry, Chelyabinsk Medical Institute]

[Abstract] Comparative analysis was conducted on the effects of heparin administration in 11 patients with toxemia due to 3rd to 4th degree thermal burns and 12 preoperative patients with rheumatic heart disease. Administration of 1.5-2.0 mg/kg heparin to the burn patients resulted in an increase in the coagulation time from a mean of 96.09 to 617.72 sec within 10 min, and in the cardiac patients from 86.75 to 337.92 sec. The greater effect in the former group was attributed to a 2.0- to 2.5-fold elevation in blood levels of intermediate-size peptides in the burn patients, whereas no elevation was noted in the cardiac patients. Experimental studies on Wistar rats and outbred dogs demonstrated that chromatographic fractions 3 and 4 of the intermediate peptides potentiated the effects of heparin, while fraction 2 possessed an anti-heparin effect. Accordingly, these observations indicate that extracorporeal detoxication by means of hemabsorption should be asssessed on an individual basis in burn patients vis-a-vis heparin administration. References 9: 7 Russian, 2 Western.

UDC 616-001.17-08+615.454.1

Treatment of Burns with Dibunol Liniment

18402107A Kiev KLINICHESKAYA KHIRURGIYA in Russian No 3, 89 (manuscript received 11 Apr 88) pp 53-54

[Article by P. M. Shalonov, T. D. Dadabayev and Kh. N. Khalidov, Chair of General Surgery, Pediatrics Faculty, Tajik State Medical Institute imeni Abu Ali Ibn Sina; Tajik Republic Burn Center, Dushanbe]

[Abstract] Therapeutic trials were conducted with liniment based on the antioxidnt dibunol in the case of 40 male and female patients with 3rd and 4th degree burns over 10 to 40% of the body surface. In addition to conventional managment, the experimental patients were also treated with the dibunol liniment applied to a 2 mm thickness, with the liniment dressing changed daily or as often as necessary. Treatment with the dibunol liniment was seen to accelerate the healing process with loss of scab in 21-25 days in 16 of the 20 experimental patients; the average hosptial stay for this group was 45 days. The corresponding figures for the 20 control patients were 26-30 days and 50 days. At the time of scab loss or removal the body temperature in the experimental group was normal or the patients were subfebrile, while the control group had temperatures of 38-39°C at the equivalent period of time. Leukocyte counts fell to an average of 8.1 x 10^9 per liter after 21-25 days, while remaining elevated in the control group at 12.9 x 10^9 per liter at 36-40 days, although showing a downward trend. These observations demonstrated the beneficial effects of dibunol liniment in the treatment of burn cases. Tables 2.

UDC 616.24-002-08:616-001.17

Microtracheotomy in Prevention and Treatment of Pneumonia in Burn Patients

18402107B Kiev KLINICHESKAYA KHIRURGIYA in Russian No 3, 89 (manuscript received 2 Feb 88) pp 55-56

[Article by A. V. Matveyenko, A. A. Batkin and Ye. A. Bautin, Chair of Thermal Lesions, Military Medical Academy imeni S. M. Kirov, Leningrad]

[Abstract] Results are presented of the use of a microtracheotomy for the managment and prevention of primary and secondary pneumonia in 126 burn patients. A polyethylene catheter was introduced for 7-12 cm into the trachea for the introduction of 60-100 ml of a special solution over a 24 h period for 5-8 days. The solution consisted of 40-80 ml furacillin (1:5000) or isotonic NaCl, 10-20 ml 2.5% aminophylline, 20-30 mg protease preparation, 10-20 mg timalin [sic], and an aminoglycoside antibiotic. The patients were turned right or left permit flow into the right or left bronchus. The solution was administeretd in fractionated doses to give 4-5 drops per minute and on occasions, for the stimulation of the cough reflex and clearing of the airways, a bolus of 2-5 ml was introduced. Both objective and subjective evidence of clinical improvement was observed

in 2-5 days, with x-rays showing attenuaton of pulmonary inflammatary changes in 10-13 days. Concomintantly, the oxygen utilization coefficient improved from 32 to 38 ml and the respiratory reserve increased. In addition, the mortality for patients on the intratracheal therapy decreased to 27% from a control figure of 53%. These observations indicate that intratracheal theapeutics should find wider application in the management of burn patients.

UDC 616-001.17-06-08

Structurally Quantified Scale for Assessment of Thrombogenic Risk in Burn Patients

18402107C Kiev KLINICHESKAYA KHIRURGIYA in Russian No 3, 89 (manuscript received 12 Sep 88) pp 56-58

[Article by S. V. Smirnov and S. V. Ignatov, Scientific Research Institute of Blood Transfusion, All-Union Hematological Center, Moscow]

[Abstract] A scale method was devised for assessing the risk of thrombogenic complications in burn patients, based on a number of clinical parameters encompassing clinical observations (eg, therapy, heart disease, obesity, varicosities), clinical chemistries (eg, thrombocyte counts, fibrinolysis, prothrombin index), and physiological factors (eg, age, sex). On the basis of the tabulated data the patients are classified into three risk groups: Group I: low risk ()moderate risk (70-140 units); and Group 3: high risk (140+ units). The application of this scale to patients with burns demonstrated the utlitiy of this approach in devising individualized therapeutic approaches. Clinical success was obtained in situations in which Group I patients were managed with 5000 IU heparin, administered subcutaneously, every 4 h for 16-18 days in conjunction with conventinal therapy. Groups II patients were responsive to intramuscular 10,000 IU heparin every 4 h for 20-25 days, and Group III patients required 10,000 IU heparin every four 4 h, intravenously, for 10 days, followed by 5,000 IU heparin for an additional 10-15 days. The scale method was found useful in providing an objective assessment of thrombogenic risk and for designation of heparin therapy. Tables 1.

UDC 616.831-002-022.7:578.833.26]-022.39-07(470.51/.54)

Clinical Manifestations of Tick-Borne Encephalitis in Middle Urals

18402111A Moscow ZHURNAL NEVROPATOLOGII I PSIKHIATRII IMENI S. S. KORSAKOVA in Russian Vol 89 No 3, 89 (manuscript received 31 Dec 87) pp 82-84

[Article by S. S. Magazanik, L. I. Volkova, O. P. Shakhmayeva, Sverdlovsk Oblast Clinical Hospital No. 1; Department of Nerve Diseases and Neurosurgery, Sverdlovsk Medical Institute]

[Abstract] Case histories are presented illustrating the dynamics of clinical manifestations of tick-borne encephalitis in the Middle Urals during 1986 and 1987. Unlike the earlier recorded forms of TBE, the more recent cases increasingly involve a chronic component that develops at the end of the acute period, with the appearance of pyramidal symptoms and progression to symptoms of cerebellar involvement. The variability and periodicity that are observed in the development of the clinical picture may be due to ecological factors as well as to individual features of the development of immunity. The symptoms observed in recent years are changing in the direction of a more serious clinical picture, with atypical forms of the disease appearing and more frequent cases of progressive course. Vaccine therapy does not always stabilize the process in such cases. References 7 (Russian).

UDC 614.252.3:616-072.85

Using an Expert Consultant Testing System for Training Medical Personnel

18402147A Kiev VRACHEBNOYE DELO in Russian No 6 Jun 89 (manuscript received 21 Sep 88) pp 121-123

[Article by L. N. Baran, I. S. Vitenko, I. N. Kononenko, and V. A. Nikolenko, Republic Procedures Office for Higher and Middle Medical Education, UkSSR Ministry of Health]

[Abstract] The constantly growing body of medical and general-science information lies at the heart of the specialist's need for problem-oriented training for early diagnosis, effective treatment and prevention of various diseases. Today's specialist, however, cannot properly perform those tasks, for at least two reasons—achievements in disciplines such as information science, electronics, and physics are enlarging the body of medical knowledge at an extremely rapid pace, and differential diagnosis and choice of treatment tactics require an integrated interdisciplinary approach that is foreign to the physician working in a narrow specialty. The most acceptable solution of this problem involves using computers and an automated teaching system. The concept of an expert consultant testing system that uses domestically manufactured personal computers is developed here, and its step-by-step implementation is outlined. The testing system can be used for the purpose of evaluating proficiency at various stages of learning and for certification purposes. The concept begins with simpler programs for those still unfamiliar with computers and gradually moves towards more complex programs. The first stage of the system is executed in BASIC, the second stage in FORTRAN. The third stage is run in PROLOG, and the PC is used in combination with IBM-PC compatibles such as the domestic YeS-1841, YeS-1845, Neyron, and Iskra-1130 and the Bulgarian YeS-1839.

UDC 616.5-004.1-06:616.16-008.1-085.835.12-036.8

Microcirculation in Patients with Systemic Scleroderma in Hyperbaric Oxygenation Treatment

18402149A Moscow KLINICHESKAYA MEDITSINA in Russian Vol 67 No 6, Jun 89 (manuscript received 9 Feb 89) pp 107-109

[Article by N. P. Makeyeva, N. P. Balakhonov, L. V. Kurakina, and L. S. Kamshilina, Department for Introductory Internal Medicine No 1, 1st Treatment Faculty, 1st Moscow Medical Institute imeni I. M. Sechenov]

[Abstract] Systemic scleroderma is among the diffuse diseases of the connective tissue and is characterized by fibrous-sclerotic changes and marked pathology of the microcirculatory bed. In 1979, hyperbaric oxygenation was incorporated in the series of traditional treatments for systemic scleroderma patients. The researchers here studied the status of microcirculation in 25 systemic scleroderma patients before and after hyperbaric oxygenation. Vascular, intravascular and extravascular changes were evaluated. Positive changes in intravascular microcirculation were noted following the treatment course. Hyperbaric oxygenation treatment improved the intravascular bed. The reseacher concluded that conjunctival biomicroscopy is an effective method for evaluating hyperbaric oxygenation treatment.

UDC 616.379-008.64-06:616.13/.16]-085.835.3-036.8-07:616.151.5

The Effect of Hyperbaric Oxygenation on the System of Hemostasis in Patients With Diabetic Angiopathy

18402149B Moscow KLINICHESKAYA MEDITSINA in Russian Vol 67 No 6 Jun 89 (manuscript received 13 Sep 88) pp 120-122

[Article by V. I. Kudinov, N. A. Korsun, and N. I. Golubenkova, Department of Internal Medicine No 1, Rostov Medical Institute]

[Abstract] In a study of blood coagulation in diabetes mellitus patients, the researchers examined the hemostasis system by looking at the thrombocyte, coagulation, and anticoagulation components and at fibrinolytic activity. A positive shift in coagulation indices followed hyperbaric oxygenation in diabetics with no clinical signs of diabetic angiopathy or changes in the cardiovascular system; an improvement in the coagulation component of the hemostasis system involved fibrinogen and fibrinogen B concentration. At the same time, fibrinogen degradation products are clearly lowered, as a result of the heparin level in the blood. Antithrombin III levels were elevated. Shifts in the thrombocyte component were more marked. No consistent shifts were noted in a group of diabetics who had had the disease for at least 10 years, had stage III-IV angiopathy of the lower extremities, had retinopathy of at least stage II, and showed signs of ischemic heart disease. Thrombocyte activity in diabetics was found to differ markedly from that of unafflicted people, and the elevation of the aggregation properties of thrombocytes is an objective indication of beginning manifestations of diabetic angiopathy. Hyperbaric oxygenation is recommended for treating various forms of diabetic angiopathy and is most effective in the early stages of the disease. References 11: 7 Russian, 4 Western.

Sewage Disinfection Device Invented

18402161a Moscow MEDITSINSKAYA GAZETA in Russian 11 Jun 89 p 4

[Article by R. Akhmetov, TASS correspondent, under the rubric "Innovation": "Steam Bath for Microbes"]

[Text] Scientists know of more than two-and-a-half thousand microorganisms that cause human illness. And even though science is creating preparations that are increasingly effective against the invisible enemies, it is far from total victory.

But research associates from the All-Union Scientific Research Institute of Veterinary Virology and Microbiology of Gosagroprom USSR have come to a solution of the problem. They have invented a unit for thermal disinfection of waste waters that contain infectious agents and other agents of dangerous illnesses that strike man and animals. The inventors were given a gold medal and certificates from the World Organization of Intellectual Property [Vsemirnaya organizatsiya intellektualnoy sobstvennosti].

"This honorary award is testimony to the high technical level of the unit," the deputy chairman of the State Commission for Inventions, Yu. Pugachev, tells news sources. "The unit went through industrial tests at 14 enterprises of various sectors and showed itself to produce a 100% disinfection; the sewage is heated with steam to 100-130° and is forced under pressure into a turbulent flow. Any microbes in such a steam bath die."

The innovation is primarily intended for large animal husbandry complexes. As everyone knows, the agrarian sector accounts for a considerable proportion of pollution. Run-off from farms—even if we consider just those with healthy animals—contains a large amount of harmful microbes. Also in dire need of such equipment are enterprises and institutions of the microbiology industry—research institutes, biofactories, veterinary laboratories, infectious hospitals, and enterprises for the processing of animal products.

Two versions of the unit were developed: a stationary unit and a portable unit. The portable unit is designed to be used to sterilize drinking water in regions in which there is the threat of a complex epidemiological situation. The stationary unit sterilizes 200 cubic meters of water in an hour, the portable, 25 cubic meters. The first batch of this equipment has already been manufactured.

The innovation is protected by three author's certificates and is patented in France, the United States, Canada, and England. It is especially useful in developing countries. In the People's Republic of the Congo, for example, it is used in the scientific veterinary laboratory. It has made it possible to reduce expenses on sewage treatment, cut the time required for disinfection considerably, and sharply improve the quality of sterilization of waste waters.

The inventors of the unit received awards according to the creative contribution each made. A gold medal was given to the head of the scientific-experimental design department, V. Kokurin, who thought up the idea; his colleagues, I. Bakulev and V. Kotlyarov, received certificates from the World Organization of Intellectual Property. In addition, they were awarded certificates from the XXI World Veterinary Congress.

UDC 579.843.94:579.222:577.1.526].08

Thymine- and Thymidine-Dependent Yersinia Pestis Mutants With Altered Thymidylate Synthetase

18400545B Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 2, Feb 89 (manuscript received 21 Jan 88) pp 24-29

[Article by B. N. Mishankin, A. N. Kravchenko and V. G. Mayskiy, Rostov-on-Don Scientific Research Antiplague Institute; Scientific Research Antiplague Institute of the Caucasus and Transcaucasus, Stavropol]

[Abstract] Evaluation of vaccine strains (EV) of Yersinia pestis revealed that both thy⁻ and thd⁻ mutants possessed an identical genetic defect in the thy A gene. In addition, evaluation of 134 Y. pestis isolates obtained in Mongolia and the Transcaucasus also revealed thy⁻ and thd⁻ mutants. The fact that the vaccine strains and the fresh isolates grew on complete media containing trimethoprim in the presence of thymidine or thymine demonstrated that the Y. pestis genome contains the tpp gene responsible for thymidine phosphorylase activity. Since the tpp gene in Y. pestis is efficiently repressed, the appearance of the mutant under study indicated derepression of the tpp gene. Accordingly, the presence of thy⁻ and thd⁻ phenotypes was attributed to a mutant thy A gene. References 11: 8 Russian, 3 Western.

UDC 579.842.23:579.253

L-Forms of Yersinia Pestis in Rodents and Ectoparasites

18400545C Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 2, Feb 89 (manuscript received 10 Feb 88) pp 36-40

[Article by L. F. Zykin, G. S. Dunayev, S. R. Sayamov and P. S. Sokolov, Volgograd Scientific Research Antiplague Institute, USSR Ministry of Health]

[Abstract] Bacteriological and immunological methods were used to assess the possibility of L-transformation in experimentally infected guinea pigs, mice and greater gerbils, using various Y. pestis isolates. In addition, infected defibrinated blood and rodents were used for infection of Ornithodorus mites. Direct and indirect evidence was obtained for L-transformations in the rodents under study. In the case of gerbils Y. pestis persisted for 40 days as L-forms and intact bacteria. In guinea pigs immunologic techniques demonstrated the persistence of specific Y. pestis antigen for 160 days, suggesting L-transformation. Furthermore, studies with murine peritoneal exudates demonstrated that the L-forms are less susceptible to phagocytosis than the intact cells, suggesting that phagocytosis may itself be a factor promoting L-transformation. Bacterial

forms were isolated from the mites for a period of three years and unstable L-forms over five years. A more detailed analysis of the persistence of L-forms of Y. pestis in nature shall require use of radioimmunoassays for greater sensitivity, and may provide new insight into the endemic aspects of plague. References 16 (Russian).

UDC 579.843.1:579.253].083.12

Use of DNA-DNA Hybrization on Filters for Determining Toxigenic Potentiation of Atypical Vibrio Cholerae Strains Isolated from Natural Sources

18400545D Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 2, Feb 89 (manuscript received 1 Mar 88) pp 41-45

[Article by V. V. Demkin, G. V. Brukhanskiy, V. I. Zakharenko, N. M. Yevdokimova, I. N. Gaylonskaya and A. G. Skavronskaya, Scientific Research Institute of Epidemiology and Microbiology imeni N. F. Gamaleya, USSR Academy of Medical Sciences, Moscow]

[Abstract] Southern blot hybridization studies were performed on atypical Vibrio cholerae isolates in an attempt to provide a genetic basis for the failure to synthesize detectable toxin. The target bacteria consisted of the eltor biovar of V. cholerae 402, 5115, 12749, 12857, 13431, and 15419. The results obtained with the LT-probe, representing a fragment of plasmid EWD299, were negative with EcoRI DNA fragments obtained from the strains in question, demonstrating that they lacked the toxin gene. In addition, radioimunoassays with rabbit antitoxin failed to detect toxin synthesis by these isolates. Observations of this type demonstrate the utility of molecular techniques in providing a definitive basis for classification of atypical cholera vibrios. In addition, equally valid results were obtained with a simplified approach to blot hybridization by the use of 20% formamide for intensification of autoradiographic images, and intact plasmid DNA (EWD-probe) rather than the LT-probe. Figures 3; references 12: 4 Russian, 8 Western.

UDC 579.852.11.081:539.143.43

NMR Relaxation Studies on Germination of Bacillus Thuringiensis Spores

18400554A Moscow BIOTEKHNOLOGIYA in Russian Vol 5 No 2, Mar-Apr 89 (manuscript received 13 Oct 86) pp 146-147

[Article by A. N. Alekseyev, V. Ya. Volkov, B. V. Sakharov and V. V. Shvetsov, All-Union Scientific Research Institute of Applied Microbiology, Obolensk, Moscow Oblast]

[Abstract] NMR relaxation time measurements were conducted on the spore germination process of B. thuringiensis to obtain a better understanding of the underlying mechanisms. The spores were activated at 75°C for 15 min and rapid cooling to 20-25°C, with initiation induced by addition of alanine and inosine to the suspension and adjustment of the temperature to 30°C for 45 min. After activation the spin-lattice relaxation time T_1 of protons decreased 5- to 10-fold and spin-spin relaxation T_2 2- to 6-fold. This change was apprarently due to loss of soluble substances from the spores. Concomitantly, the volume of water absorbed by the spores increased more than 1.5-fold, with its relaxation time T_1 decreasing 2- to 3-fold and the T_2 time remaining virtually unaltered. These observations demonstrated ingress of water at the earliest stages of germination when such changes are undetectable by refractometry. Tables 2; references 3: 1 Russian, 2 Western.

UDC 579.852.11.01

Effects of Intensity of Oxygen Mass Exchange on Growth of Bacillus *Thuringiensis var. Dendrolimus*

18400554B Moscow BIOTEKHNOLOGIYA in Russian Vol 5 No 2, Mar-Apr 89 (manuscript received 15 Aug 86) pp 164-167

[Article by V. I. Ogarkov, V. S. Muratov, A. A. Myalkin, Yu. B. Igonin and O. N. Dobrokhotskiy, Scientific Research Construction and Planning Institute of Applied Microbiology, Moscow]

[Abstract] An analysis was conducted on the effects of the intensity of aeration on the growth of B. thuringiensis var. dendrolimus 49, the source of dendrobacillin. The cells were grown on multicomponent (I) and yeast polysaccharide (II) media, with the final cell concentration correlated with oxygen mass exchange (K_L), as determined by the sulfite method. Determinations of the optimum aeration conditions revealed that for medium I maximum cell concentration (10.1 x 10^9/ml corresponded to K_L of 1200 to 1500 h^{-1}. In the case of medium II the maximum cell concentration of 6.3 x 10^9/ml was obtained with K_L of 1400 to 1600 h^{-1}. In addition, the study showed that reduction of K_L from 1400 to 580 h^{-1} at the stage of intense sporogenesis had no effect on productivity but greatly prolonged the growth process. Figurs 3; tables 1; references 11: 9 Russian, 2 Western.

UDC: 616.98:579.852.11]-092.19-07:[616.155.33-02:615.919:579.852.11

Effects of Bacillus Anthracis Lethal Toxin on Phagocytosis and Antioxidant System of Peritoneal Mononuclear Phagocytes of Mice Differing in Susceptibility to Anthrax Moscow

18400575C Moscow BYULLETEN EKSPERIMENTALNOY BIOLOGII I MEDITSINY in Russian Vol 107 No 3, Mar 89 (manuscript received 18 Dec 87) pp 288-291

[Article by V. A. Abalakin, Ye. P. Sorochinskaya, N. I. Osipova and V. A. Yurkiv, Central Scientific Research Institute of Epidemiology, USSR Ministry of Health, Moscow]

[Abstract] In view of the fact that the lethal toxin of Bacillus anthracis acts selectively on mononuclear phagocytes, a study was conducted on the effects of the toxin on the phagocytic activity and antioxidant system of peritoneal macrophages derived from mice resistant (BALB/c) and susceptible (CBA/lac) to anthrax. Phagocytic activity of peritoneal macrophages for sheep red cells was essentially identical for both mouse line. However, the data showed that the lethal toxin (PA + LF = 4:1; PA = protective factor, LF = lethal factor) inhibited the phagocytic activity of the BALB/c peritoneal macrophages to a greater extent than that of the macrophages derived from the CBA/lac mice. In addition, the purified lethal toxin was also demonstrated to decrease the glutathione reducing potential of the peritoneal mononuclear phagocytes derived from the BALB/c mice, while the CBA/lac cells remained unaffected. The latter indicates that the lethal toxin leads to greater accumulation of hydrogen peroxide in the peritoneal macrophages of the BALB/c mice than in the CBA/lac mice, a factor that may account for the greater bactericidal activity of the former cells and, hence, the greater resistance of the BALB/c mice to anthrax. Figures 3; tables 1; references 12: 6 Russian, 6 Western.

UDC 579.844.91.222'15:620.193.8

Possible Functions of Hydrogenase of Sulfate-Reducing Bacteria Related to Underground Metal Corrosion

18400597A Kiev MIKROBIOLOGICHESKIY ZHURNAL in Russian Vol 51 No 2, Mar-Apr 89 (manuscript received 18 Feb 88) pp 53-55

[Article by A. I. Pilyashenko-Novokhatnyy, Institute of Microbiology and Virology, Urkainian Academy of Sciences, Kiev]

[Abstract] Sulfate-reducing bacteria have been shown to have a significant influence on acceleration of corrosion of underground metal structures. In assessing just how much of a role they play in such corrosion, it is important to consider not only the population density of such bacteria, but also the level of activity of their oxidizing-reducing enzymes, particularly hydrogenase. This article discusses the function of hydrogenase in corrosion processes occurring with the participation of such bacteria. The studies indicate that hydrogenase can influence various stages of the corrosion process, both in the breakdown of cathodic protective films and in direct action on the metal surface. Accumulation of hydrogenase in the extracellular medium may be decisive in rapid development of underground corrosion. Figures 3, References 12: 6 Russian, 6 Western.

UDC 615.2:355

Field Testing—An Important Stage in the Development of New Protective Drugs

18400565 Moscow VOYENNO-MEDITSINSKIY ZHURNAL No 2, Feb 89 pp 14-15

[Article by Professor, Medical Corps Lieutenant General V. G. Vladimirov and USSR State Prize Laureate, candidate of medical sciences, Medical Corps Major General R. A. Marasanov]

[Text] A characteristic mark of the present day is the vigorous pace of scientific-technical progress, which has affected not only the economic sphere, but also all areas of military activity, including the medical services. On the one hand, the active advances made by the sciences have significantly altered the operational atmosphere itself both of individual medical specialists and corresponding collectives of personnel and has imbued the work with a spirit of creativeness and inventiveness. On the other hand, the emergence of mass destruction weapons (MDW) in the army arsenals of various countries has confronted the medical services with the task of developing fundamentally new drugs, methods, and equipment for protecting personnel.

The majority of those new developments would be utilized together, as a single protective system against MDW. Many of the contemporary drugs will be utilized as preventive measures, and the personnel who have taken them will be carrying out combat operations. Hence one of the principal requirements for such drugs—in addition to being highly specific in their activity, all of these drugs must be well tolerated and cannot reduce the level of the individual's combat effectiveness.

The forms of combat operations undertaken by military forces today are highly diverse. Thus, in many cases the work of military specialists—whose number is quite large as a result of the development of equipment and advances in its tactical employment—will be done, as a rule, under considerable physical and mental stress and frequently under extreme conditions. What kind of effects will the new drugs have on the functional state of the body and the combat effectiveness of the individual? The answers to those questions can be obtained only through field testing, in which military medical personnel must take an active part.

Inasmuch as protective drugs against MDW will be utilized on a large scale, a high degree of effectiveness is certainly not the only condition that such an agent will have to satisfy. The existing biomedical requirements for such drugs are quite rigorous. In particular, they must be compatible with other protective drugs and must not reduce the therapeutic properties of preparations used to treat battle victims. They must be in a form convenient for widespread use, they must be manufactured from accessible and inexpensive raw materials, they must be adaptable for mass production, and they must have a good shelf life (no less than two to three years). At the same time they must not cause any marked toxic reactions or side effects, and they must not lower the immunity acquired after the administration of authorized vaccines. A number of other characteristics that can play a role in the determination of a drug's ultimate fate must also be considered.

In recent years a whole complex of drugs has been developed, and many of them are fundamentally new and exhibit a high degree of specificity. However, the conditions under which they can be used and the extent of their application have not yet been conclusively studied. Here is where the participation of the district military service representatives is quite important as test-researchers, particularly if one considers that the military physicians have a clear understanding of the military's needs and requirements for such preparations and are quite aware of the weak points in the operations of the medical corps.

These preparations can be conclusively evaluated only after a multi-faceted and thorough examination of their properties, particularly their action under varied conditions. In that connection the correctness of theoretical conclusions is being verified and their practical importance is being measured. Moreover, these kinds of investigations could result in fundamentally new findings that will either expand the indicated uses of the tested agents or, conversely, disclose serious shortcomings.

In recalling the exceptionally important role played by method in scientific research, considerable attention should be given to the methodological aspects of such work. Method is a most important vehicle in making scientific inquiry more effective and is conducive to the intensification of scientific research. That is why the incorporation of new advanced research methods is today both a theoretical and a practical task.

We must make full use of mathematical modeling methods as well as the statistical processing of research results. One should remember that it is only with quantitative methods of analysis of the various aspects of combat that one can identify the presence of a given pattern. Recent scientific investigations, including military medical research, have been making broad use of modeling methods which make it possible to study the properties of medical protective agents under conditions that are quite close to combat situations. In some cases modeling is the only way of obtaining reliable information about the nature of the action and efficacy of preparations and certain equipment during the employment of mass destruction weapons. In that connection, the selection of adequate models constitutes a very important problem.

Considerable attention must be given to documentation in the testing process. All operations must be performed in accordance with the prescribed manuals. Especially important in those manuals are the testing routines—the methodological-organizational planning document

which stipulates the primary purpose and procedures for conducting the research, the conditions and time sequence for completing the various individual steps, and the manpower and resources that are involved. The routines are set up on the basis of the specific properties and intended use of the items under study. The section dealing with testing methods should provide for methods which allow one to ascertain in the most effective and reliable manner whether or not the experimental models satisfy the requirements in the preliminary specifications. Based on the results of the tests, the working design documents are then adjusted to ready them for the serial production of the model.

The field testing must include a study of not only the efficacy and safety of the drugs and equipment, but also the reliability and convenience of use of the equipment and the effect of the drugs on the individual's efficiency and ability to perform his primary missions at a high performance level. The conclusion, which is usually made in the form of a report, should also offer an evaluation of the items tested and give recommendations for their adoption.

Testing is conducted either during routine combat training operations or during training exercises in which subunits and units are placed in the field. This requires the creation of conditions as near as possible to actual conditions and the selection of contingents that reflect the special features of troop combat activity. The preparations should be tested in no less than two or three regions of the country. For example, antidotes and radiation protectors should be tested in different climate zones that are characterized by large temperature gradients, etc.

The final field tests must be controlled by an order that is issued by the command authorities and that stipulates the composition of the commission and the place and time of testing, as well as the material and technical manpower and resources support. The designer of the drug or piece of equipment must, as a rule, participate in compiling the design of the testing routines. If necessary, a representative of the designer should go out to the testing site for the purpose of instructing or training the service personnel in the correct use of the item being tested.

Many important medical problems, including theoretical problems and those that are associated with the design and testing of new drugs and equipment, should be resolved in field exercises and special tactical exercises. In turn, certain principals that are formulated in the course of the exercises can give rise to the undertaking of goal-oriented scientific work or to the incorporation of substantial modifications in the results of research that was done previously.

The active participation by the medical service at the district, group of forces, and fleet levels in the resolution of the problems raised in this report will not only help to solve a number of important problems faced by the medical services, but will also facilitate a greater involvement of military physicians in scientific research, allow them to master contemporary methods for conducting large-scale tests, and make them full-fledged co-participants in such projects. There is no doubt that in such cases the designers, too, will get much valuable advice, and fundamentally new solutions to some problems may even be found. The direct participants in the testing programs and field research will be able to gain specific factual data that could be subsequently summarized and presented in the form of scientific reports, articles, and dissertations.

Treatment of Mine-Detonation Wounds

18402097a Moscow MEDITSINSKAYA GAZETA in Russian 24 May 89 p 3

[Article by A. Sarkisyan, doctor of medical sciences and deputy director of the Central Institute of Traumatology and Orthopedics imeni Priorov: "Treatment of Mine-Detonation Wounds"]

[Text] The use of a static magnetic field (SMF) in the treatment of mine-detonation wounds of the limbs is linked to its antiedemic action. This factor exerts a normalizing influence on the trauma-altered metabolism of the soft tissues, which leads to an alleviation of pain, edema, symptoms of inflammation, and other manifestations of microcirculatory disruption in the injured segment of the limb. Magneto-therapeutic correction of hemodynamic disorders is done with magetophore applicators with an induction of 30-35 millitesla.

To improve the effectiveness of the sanitizing steps taken during surgical treatment of mine-detonation wounds of the distal segments of the limbs, and also during the bandaging when suppurative complications develop in the victims, we employ an ultrasound bath to sanitize not only the wound, but also the entire distal segment of the limb.

We are convinced that the curative capabilities of low-frequency ultrasound in the case of mine-detonation wounds fully utilized only with the use of the ultrasound bath, which, unlike the traditional method of sonic therapy using a cylindrical waveguide, substantially simplifies and facilitates the procedure of ultrasound treatment of wounds.

Recently, endovascular laser therapy has been used for treating suppurative-septic complications that have developed. Depending on the dynamics of the process, the general condition of the patients, and the laboratory data, the course of laser treatment consisted of 5-8 daily sessions. If needed, the course of laser treatment is repeated in 4-5 days.

Comparison of the effectiveness of treatment of patients with and without use of endovascular laser therapy revealed a higher survival rate for patients in the group using laser therapy for treatment purposes. In patients with sharp suppression of reactivity, use of endovascular

laser therapy that was combined with other treatment procedures made it possible not only to avert the death of the patients, but also avoid amputation of the limb in the case of some of them.

Electromagnetic waves of millimeter radiation have excellent prospects in the treatment of patients with mine-detonation wounds. This HF therapy is done by means of the portable Yav-1 devices. These have been used to affect the zones of segmental innervation and certain reflexogenic zones of the plantar region on the side with the wound. The use of millimeter waves has been used to improve the effectiveness of the therapy being done on two groups of patients: after sanitizing operations of the necrosequestrectomy type, performed in the case of suppuration of gunshot fractures, another group of patients with suppurating wounds treated by bandaging.

It was established that the use of HF therapy enables a notable decrease in the number of relapses of infectious complications after performance of sanitizing operations.

UDC 616-001.4-089.43:661.183.2

Use of Activated Carbon Fiber Material for Local Wound Treatment

18402087 Leningrad VESTNIK KHIRURGII IMENI I. I. GREKOVA in Russian Vol 142 No 1, Jan 89 (manuscript received 15 Dec 87) pp 59-62

[Article by Dr. of Medical Sciences V.A. Kornilov, V. Yu. Ulchenko, and Candidate of Biological Sciences Ye. V. Yeretskaya, Military-Field Surgery Clinic, Military-Medical Academy imeni S. M. Kirov, Leningrad]

[Abstract] Clinical-experimental studies were performed to determine the effects of local application of carbon sorbents on wound healing and to determine indications for their application. Clinical studies were performed on 94 patients (78% of whom were males of working age) with 103 wounds—44% from injury, 44% from surgery, 12% from burns. Wound surface exceeded 1% of body surface in over 40% of cases. The authors concluded that activated carbon-fiber material can be used to create dressings with low or high adhesion to the wound surface. Application of such material to wounds not requiring surgery results in the formation of a dry scab, beneath which the wound heals. The method is particularly effective in an outpatient setting, since no bandaging is required. The anti-inflammatory effect of the material is greatest in the first few hours after trauma. Inflammation is reduced because of the removal of biologically-active substances, dehydration of the tissue and sorption of microorganisms in the wound. References 2: 1 Russian, 1 Western.

UDC 616.24-002-02:616-001.43:355.4

Mechanisms of Development and Clinical Prodromes of Secondary Pneumonias in Mine-Explosion Traumas

18400567A Moscow VOYENNO-MEDITSINSKIY ZHURNAL in Russian No 3, Mar 89 pp 21-24

[Article by P. O. Vyazitskiy, Professor, Lieutenant General of Medical Corps, V. I. Komarov, Docent, Colonel of Medical Corps, V. Khabibi, Chief of Central Military Hospital of Republic of Afghanistan Ministry of Defense, Candidate of Medical Sciences, Major General of Medical Service, and I. P. Minnullin, Candidate of Medical Sciences, Lieutenant Colonel of Medical Corps]

[Abstract] The second of two reports (the first appeared in VOYENNO-MEDITSINSKIY ZHURNAL, 1988, No 11, pp 25-29) is presented on local changes in the lungs and the mechanism of their formation in 48 persons injured by contact with exploding antipersonnel mines and 58 persons who did not come in contact with the mines but who were injured by the explosion. Explosion factors causing injuries included the shock wave, flame and gases, primary projectiles and secondary projectiles. Multiple wounds were often accompanied by shock and acute respiratory insufficiency. The general conclusion from the clinical observations is that the mechanism of formation of acute respiratory insufficiency and of pneumonia was common in all patients. Development of pneumonia caused the progressive respiratory insufficiency. Prevention of pneumonia requires the same steps as prevention of acute respiratory insufficiency.

UDC 614.006.5]:681.3

Use of Minicomputers to Automate Medical Supply Storage Accounting

18400567C Moscow VOYENNO-MEDITSINSKIY ZHURNAL in Russian No 3, Mar 89 pp 50-52

[Article by O. V. Vornkov, candidate of pharmaceutical sciences and colonel of medical service, and L. N. Orlova]

[Abstract] Automation of accounting and reporting information has helped to improve the economic mechanism of military-medical supply. However, there has been a lag in automating accounting in pharmacies and medical supply storage areas, where the first results are just coming in. The problem-oriented Iskra-555 computer, plus data base management software and bookkeeping language facilities, can be recommended for this purpose. The Iskra-555, which is capable of 650,000 operations per second, can be used independently or in a local computer network. It can be used in systems with data transfer on punched tape, magnetic disk, floppy disk, magnetic tape, or magnetic tape in minicassettes. Another consideration driving the authors' recommendation of the Iskra-555 is the fact that it will be replaced in the near future by

the Iskra-1030 PC. A system for automatic information processing is described. The annual savings resulting from automation of accounting for medical supplies and the inventory process, which is performed 5 to 6 times per year, is said to be 2,500-3,000 rubles per year per storage location. The specific location where the system here described in used is not mentioned.

UDC 577.3.04

Radio Reception of High-Frequency Electromagnetic Field by Escherichia coli Cells

18400525 Kiev DOKLADY AKADEMII NAUK UKRAINSKOY SSR. SERIYA B: GEOLOGICHESKIYE, KHIMICHESKIYE I BIOLOGICHESKIYE NAUKI in Russian No 5, May 89 (Manuscript received 11 Nov 88) pp 65-69

[Article by Yu. N. Levchuk, A. I. Karachentseva, Institute of Biochemistry, Ukrainian Academy of Sciences, Kiev; "Otklik" Temporary Scientific Team, Kiev]

[Abstract] A study is made of the influence of a 37-53 GHz, 3mW magnetic field on the parameters of the spectra of the quasielastic scattering of light by a suspension of E. coli. The field is found to cause radiotaxis—a deterministic motion of the microorganisms that is oriented with respect to the gradient of the stimulus. An exponential rf field gradient is automatically maintained by absorption of the radiation by the medium. Since the concentration of the bacteria is reduced by the field, negative radiotaxis takes place. Use of a heating element geometrically identical to a dielectric antenna revealed the absence of the effect of heat, as a result of the absorption of the radiation at 3-10 mW, on the parameters of the microstructure of the E. coli suspension that were determined via quasielastic scattering of light. Additional heating of the upper layer of the suspension (20-35 mW) increased the integral of the spectrum, i.e., it produced positive thermotaxis. Variation in the broad range of power of the probing radiation did not produce changes in the microstructure of the E. coli suspension. Exposing a suspension of tobacco mosaic virus to the field, under identical conditions, did not produce any changes in the suspension, which indicates that the effect of the radiation on the bacteria is not mediated. The effects of the hf field on the E. coli suspension were observed to be reversible. The researchers surmise that the receptiveness of the bacteria to the hf field is due to specific radio receptors that were formed in the early stages of evolution and were preserved until our time in prokaryotic cells. The mechanism of reception is felt to consist in the interaction of the electromagnetic field and the relaxation modes of the protein macromolecules, which, in protein in the field, results in a change in the spectrum of large-scale intramolecular motions whose return times immediately find themselves in the gigahertz range. References 12: 6 Russian, 6 Western.

UDC 616.233-002:616.15-07:616.24-008.8-07:612.13:612.2]:613.163

Effectiveness of Low-Frequency Electromagnetic Fields in Chronic Bronchitis

18400567B Moscow VOYENNO-MEDITSINSKIY ZHURNAL in Russian No 3, Mar 89 pp 35-36

[Article by Professor V. M. Yurlov, T. A. Yeksareva, and Colonel of the Medical Corps V. F. Dolodarenko]

[Abstract] The therapeutic effect of various low-frequency electromagnetic fields in combination with medications (antibacterials, desensitizers, mucolytics, and broncholytics) was studied in patients with chronic bronchitis. Hospital studies were performed on 146 patients 19 to 80 years of age with bronchitis histories of 1-34 years. The subjects were divided into five groups. The first was treated with an alternating 50 Hz electromagnetic field with two 23-35 mT 135 cm^2 inductors; the upper and lower areas of each lung were treated alternately. The individuals in the second group were treated with a belt consisting of eight 5-14 mT 8.75 cm^2 inductors; the belt was worn over the upper portion of the rib cage and then over the lower portion. Those in the third group wore the belt, but a pulsed field was used via 6-13 mT inductors. The fourth group was exposed to local inductothermy, and the fifth group was exposed to a simulated alternating field in a double-blind context. The subjects underwent 15 procedures, each of which lasted 15-20 minutes. The combined treatment was found to have an anti-inflammatory effect, favorably influencing bronchial air flow, pulmonary respiration, peripheral hemodynamics and the functional status of the right ventricle of the heart. The best indices were achieved in the individuals who wore the inductor belts. The inductothermy and the low-frequency electromagnetic fields produced identical effects on cardiohemodynamics, whereas the electromagnetic fields had a greater effect on the physical and biochemical properties of the sputum and on external respiration function. Differences produced in parameters by the alternating field, the pulsed field, and placebo were not found to be a response to the procedure. References 4 (Russian).

UDC 616.2-056.3:615.37

Clinical and Immunological Rationale for Decimeter Wave (DW)-Management of Respiratory Allergies

1840277B Kiev ZHURNAL USHNYKH, NOSOVYKH I GORLOVYKH BOLEZNEY in Russian Vol 2 1989 (manuscript received 6 Jan 89) pp 53-57

[Article by A. A. Tereshchenko, Chair of Clinical Immunology and Allergology, Kiev Institute of Postgraduate Medicine]

[Abstract] Therapeutic trials were conducted with the use of DW in the management of patients with respiratory allergies, concentrating on 28 patients with pollinosis and 22 with atopic bronchial asthma. A Romashka instrument was used to deliver the DW via a 40 mm diameter emitter at the thymic chest projection according to the following scheme: day 1 = 4 W for 4 min; day 2 = 5 W for 5 min, day 3 = 6 W for 6 min, days 4-12 = 7 W for 7 min. Subjective and objective clinical criteria demonstrated that a marked improvement occurred in 66.7% of the pollinosis patients, and moderate improvement in 33.3%. The corresponding figures for the patients with bronchial asthma were 60.0 and 40.0%. Immunological workups on the pollinosis patients showed that DW therapy led to an increase in the percentage of T and B lymphocytes, and a reduction in the null cells (p)In addition, serum levels of immunoglobulins and secretory IgA evidenced approximation of normal levels. Similar treatment of healthy control subjects demonstrated that the treatment was innocuous. These observations demonstrated that the DW treatment was efficacious in the treatment of respiratory allergies and may be used in conjunction with other therapeutic modalities. Tables 2; references 11: 10 Russian, 1 Western.

UDC 616.74-009-085.849.11-036.8-092.9 + 615.849.11.015.4:612.816

Comparative Analysis of the Effect of Pulsating Magnetic and Electrical Stimulation on Skeletal Musculature (Experimental Research)

18402148C Moscow VOPROSY KURORTOLOGII, FIZIOTERAPII I LECHEBNOY FIZICHESKOY KULTURY in Russian No 3 May-Jun 89 (manuscript received 9 Jan 89) pp 50-53

[Article by S. N. Malikova, A. B. Antonov, G. A. Govor, and V. M. Dubrovenskiy, All-Union Scientific Center for Rehabilitation and Physical Therapy, USSR Ministry of Health, Moscow]

[Abstract] The effect of a pulsating magnetic field on the neuromuscular system is compared with that of electrical stimulation based on the data of electromyographic analysis. The sciatic nerves of rabbits were electrically and magnetically stimulated, latent periods of muscular response and their duration were evaluated, and a comparative analysis of the results was made. Pulsating magnetic stimulation with an inductance of 1.2 tesla was at least as effective as electrical stimulation in terms of its impact on the neuromuscular system, and in many cases was more effective. The advantage of pulsating magnetic stimulation is that it involves no contact. Figures 4, references 3 (Russian).

UDC 615.213.015.2:615.31:577.112.6].07

Effects of Delta Sleep-Inducing Peptide (DSIP) on Generalized Epileptic Seizures

18400564D Moscow BYULLETEN EKSPERIMENTALNOY BIOLOGII I MEDITSINY in Russian Vol 107 No 2, Feb 89 (manuscript received 30 Oct 87) pp 211-214

[Article by A. A. Shandra, L. S. Godlevskiy, A. M. Mazarati and R. F. Makulkin, Chair of Pathologic Physiology, Odessa Medical Institute imeni N. I. Pirogov]

[Abstract] Pharmacologically-induced epileptic seizures in (CBA x C57Bl/6)F_1 mice served as a model system in studies on the putative mechanism of anticonvulsant activity of DSIP. Intraperitoneal administration of DSIP before or after several epileptogenic agents delayed the onset of convulsions and mitigated the severity of the seizures. DSIP was active in the 10-100 μg/kg range without a linear dose-response relationship in the case of convulsions induced by Corazol, bicucullin, and to a lesser extent picrotoxin. However, DSIP was ineffective against convulsions due to thiosemicarbazide and strychnine. These observations point to the fact that the effects of DSIP are mediated via GABA receptors. Figures 3; tables 1; references 7: 4 Russian, 3 Western.

UDC 616-001.17-085.31:547.96].017:615.275.4]-092.9-036.8

Experimental Therapeutic Trial With Biogenic Peptide Preparations in Thermal Burns

18400599B Moscow PATOLOGICHESKAYA FIZIOLOGIYA I EKSPERIMENTALNAYA TERAPIYA in Russian No 2, Mar-Apr 89 pp 39-42

[Article by V. Ye. Ryabinin, A. L. Tsytovich, R. I. Lifshits and V. S. Potapov, Chair of Biochemistry, Chelyabinsk Medical Institute]

[Abstract] Therapeutic trials were conducted with a membrane fraction of Lactobacillus bulgaricus (MFLB), alcohol plasma extract (APE), and the commercial preparation solcoseryl (deproteinized blood extract) in the management of outbred and female (CBA x C57Bl)F_1 mice with 3rd to 4th degree burns over 10-12% body surface. MFLB (30 mg/kg, i.p.) was found to be ineffective whether given before or after the trauma. However, both solcoseryl (10 mg/kg) and APE given 1 h after the trauma i.v. (0.2 ml) or i.p. (0.5 ml) reduced mortality by 40-42% and maintained the survival rate for 30 days; whereas control mortality was 100% in 2-3 days. Both agents enhanced oxygen uptake 2- to 3-fold 24 h after the trauma over control values, bringing this parameter to normal baseline in 7 days. In addition, solcoseryl was also shown to be a potent anti-inflammatory agent and accelerated wound healing, reducing the wound area to 336.2 mm^2 after 7 days versus a control area of 469.6 mm^2. The results with i.v. APE were analogous to those seen with solcoseryl, indicating the need for further studies on APE. Figures 1; references 13: 10 Russian, 2 Western.

UDC 591.089.84.612.8

Quantitative Analysis of Development of Neurons in Cerebral Cortex Embryonal Tissue Transplanted into the Brain of Mature Rats, As Compared with Neuron Development in Intact Brain

18400522A Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 306 No 2, May 88 (Manuscript received 12 Jul 88) pp 472-476

[Article by Ye. N. Kozlova and M. A. Aleksandrova, Institute of General Genetics imeni N. I. Vavilov, USSR Academy of Sciences, Moscow]

[Abstract] This article presents a unique comparative study of the development of embryonal nerve tissue and normal differentiation of neurons in ontogenesis. Experiments were performed on 66 Wistar rats. The tissue recipients were females weighing 200-250 g, and the donors were 17-day embryos. The results indicate that neocortical transplantates gradually differentiate in the sensomotor area of the host brain. Cell types appear characteristic for the cerebral cortex, but they do not show the typical layered organization of transplantate tissues. Differentiation in the transplantates and in the neocortex of the normal animals occurred synchronously, in spite of a greatly reduced relative number of nerve cells in the transplantates as a result of the surgery. Transplantation thus does not change the dynamics of development of embryonal nerve tissue, although it significantly decreases the number of neurons in the transplanted tissue in comparison to normally developed brain tissue. Figures 2, references 8: 1 Russian, 7 Western.

UDC 616-092:613.863]-092.9

Oligopeptides and the Mechanisms of Emotional Stress Tolerance

18400540A Moscow PATOLOGICHESKAYA FIZIOLOGIYA I EKSPERIMENTALNAYA TERAPIYA in Russian No 1, Jan-Feb 89 (manuscript received 31 Mar 88) pp 3-11

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

[Abstract] Animals studies using various stress models (e.g., immobilization, electrical stimulation, etc.) have shown considerable differences among rats in tolerance of emotional stress. Wistar rats demonstrated the greatest tolerance on the basis of survival figures, while August rats were shown to be most susceptible to the adverse effects of stress. Additional studies demonstrated that a diet high in small peptides had a negative impact on stress tolerance, and further biochemical studies revealed that the Wistar rats had higher hypothalamic and blood levels of beta-endorphin and delta-sleep peptide than the August rats. In addition, hypothalamic concentrations of substance P were also higher in the Wistar rats than in the August rats. Studies on rabbits provided confirmatory data on the significance of endogenous peptides in the mechanisms of stress tolerance, since injection of the delta-sleep peptide and substance P into the lateral ventricles enhanced tolerance. Administration of these peptides corrects a stress-induced drop in hypothalamic norepinephrine and susceptibility of the ventromedial hypothalamic neurons to the action of norepinephrine. These observations suggest that certain endogenous peptides may eventually find applications in clinical stress management. Figures 5, references 31: 27 Russian, 4 Western.

UDC 616.8-009.7-02:613.868]-092.9-02:615.814.1]-07

Prevention of Hypoalgesic Action of Hunger-Induced Stress With Electroacupuncture

18400540B Moscow PATOLOGICHESKAYA FIZIOLOGIYA I EKSPERIMENTALNAYA TERAPIYA in Russian No 1, Jan-Feb 89 (manuscript received 17 Dec 87) pp 14-17

[Article by A. M. Vasilenko, A. V. Chistyakov and Yu. A. Goltsev, Laboratory of Reflexoprevention of Stress, Central Scientific Research Institute of Reflexotherapy, USSR Ministry of Health, Moscow]

[Abstract] Therapeutic trials were conducted with electroacupuncture to assess its efficacy in alleviating hunger-induced analgesia. The studies were conducted with 12 healthy male volunteers, 19 to 30 years old, in whom sensitivity to pain was evaluated on the basis of pain thesholds after electrical stimulation, the visual analog scale method, and somatosensory evoked potentials ($N_{120}P_{250}$). The subjects fasted for four days, with free access to water. The volunteers were subjected to electroacupuncture (20 Hz stimuli to subthresholds of pain perception for 20 min/day) for ten days prior to fasting and to acupuncture point massage (employing points V-11 through V-17, Gi-4, Gi-5, Gi-10, G-11, TP-5, E-36, and VB-34.21) during the first three days of fasting. The results demonstrated that hunger depressed nociception in terms of all test parameters. Electroacupuncture was demonstrated to attenuate hunger-induced depression of pain sensitivity and diminish feelings of hunger. These findings suggest that electroacupuncture may find use in overcoming the adverse effects of stress. Figures 3; references 13: 10 Russian, 3 Western.

UDC 612.766.2.014.49.08:[612.822.3:577.175 82+612.89

Reorganization of Brain Neuromediator Function and Autonomic Rest Regulation in Adaptation to Chronic Hypokinesia

18400548E Moscow GIGIYENA I SANITARIYA in Russian No 3, Mar 89 (manuscript received 9 Sep 87) pp 85-86

[Article by N. G. Zhuravleva, Scientific Research Institute of Labor Hygiene and Occupational Diseases, USSR Academy of Medical Sciences, Moscow]

[Abstract] Observations that EEG is affected by prolonged hypokinesia led to studies on brain neurotransmitter function and autonomic regulation in rats subjected to long-term hypokinesia. The studies were conducted with male Wistar rats, beginning at the age of 1.5 months, maintained in small cages for 23 h per day, 5 days a week for 8-10 months. Determinations of the neurotransmitter levels in the brain and pertinent enzymatic activities showed that adaptation to hypokinesia involved diminished activity of the cholinergic and serotonergic systems and a compensatory activation of the noradrenergic system. Depression of the cholinergic system is evidently responsible for EEG depression, while enhancement of the noradrenergic mechanisms is responsible for increased reactivity to external stimuli. Changes in the neurotransmitter status were interpreted as reflecting increased emotional reactivity and diminished performance capacity of the brain predisposing to rapid mental fatigue in prolonged stress. References 14: 8 Russian, 6 Western.

UDC 612.28+612.822.3

Effect of TRH and TRH Analog (P-546) on Respiratory Activity of Intact and Vagotomized Rabbits

18400587 Leningrad FIZIOLOGICHESKIY ZHURNAL SSSR IMENI I. M. SECHENOV in Russian Vol 75 No 3, Mar 89 (manuscript received 6 Jan 88) pp 409-412

[Article by A. A. Batyrgozhina, I. S. Breslav and M. O. Segizbayeva, Chair of Human and Animal Physiology, Kazakh State Universtiy imeni S. M. Kirov, Alma-Ata; Laboratory of Respiratory Physiology, Institute of Physiology imeni I. P. Pavlov, USSR Academy of Sciences, Leningrad]

[Abstract] An electrophysiological study was conducted on the effect of TRH and its synthetic analog P-546 on respiratory function in 2.5-3.0 kg rabbits under Nembutal (45 mg/kg). The experimental design involved priming the animals with 20 /kg TRH or P-546 15-20 min prior to bilateral vagotomy or forced hyperventilation leading to apnea. In another approach 20-60 μg/kg TRH or P-546 was administered into the carotid artery or intracisternally after removal of up to 100 ml of blood from the common carotid artery in combination with vagotomy. In each case administration of either TRH or of the analog enhanced respiratory activity or overcame apnea, which was anticipated from the respiratory enhancement seen in intact control animals. In addition, P-546 was more efficient than TRH. In the hemorrhage + vagotomy study recovery of respiratopry activity was obtained in 1 min after instracisternal injection, and after 4-5 min with intra-arterial administration. This is the first report on the effects of P-546 on respiration. The effects of TRH and P-546 on respiration are presumably due to their effects on the bulbar-pontine formations. Figures 2; tables 1; references 12: 4 Russian, 8 Western.

UDC 611.45-018.1:616.45-001.1/.3:576.8-097.4

Effects of Biomos Pretreatment and Stress on Adrenocortical Ultrastructure in Rats

18402084A Kiev TSITOLOGIYA I GENETIKA in Russian Vol 23 No 1, Jan-Feb 89 (manuscript received 22 Sep 87) pp 3-6

[Article by T. I. Bogdanova, V. M. Gordiyenko and A. M. Beskrovnyy, Kiev Scientific Research Institute of Endocrinology and Metabolism, Ukrainian SSR Ministry of Health]

[Abstract] Further assessment was conducted on the physiological efficacy of biomos, a novel class of biostimulants consisting of polycondensate metallocomplexes, employing a rat stress model. The results were analyzed in terms of adrenocortical ultrastructure and blood levels of 11-hydroxycorticosteroids (11-HCS) in young male Wistar rats (120-140 g). Pretreatment of rats with biomos via drinking water (5 ml/kg 5% solution) for 2 weeks induced marked ultrastructural changes in the zona glomerulosa indicative of enhanced synthesis of steroid hormones. The latter impression was confirmed by elevation of plasma 11-HCS to 558.4 nmoles/L from a control value of 525.0 nmoles/L. Subjecting the animals to stress in the form of immobilization in the supine position for 6 h at 2-4°C led to destructive changes in the zona glomerulosa and zona fasciculata of the adrenal cortex, and elevation of plasma 11-HCS to a mean of 1525 nmoles/L. Pretreatment with biomos attenuated the destructive changes due to stress, prevented development of ulcerative changes in the gastrointestinal mucosa, and limited the rise in plasma 11-HCS to 791.7 nmoles/L. The data demonsrtated that biomos exerted a protective effect on the rat organism. In addition, biomos was also demonstrated to prevent depletion of catecholamines as seen by the accumulation of secretory granules in chromaffin cells. Figures 5; references 20: 16 Russian, 4 Western.

UDC 612.8+591.51

Behavioral Effects of Immunization of Albino Rats with Sydnophen-Bovine Serum Albumin Conjugates

18402104A Moscow BIOLOGICHESKIYE NAUKI in Russian Vol 303 No 3, 89 (manuscript received 2 Dec 88) pp 63-69

[Article by R. A. Danilova, M. F. Obukhova, Sh. K. Sagimbayeva, M. D. Mashkovskiy and I. P. Ashmarin, Chair of Human and Animal Physiology, Moscow State University]

[Abstract] An analysis was conducted on the behavioral effects of immunization of outbred, albino male rats (150-200 g) with sydnophen-bovine serum albumin (S-BSA) conjugate. The S-BSA conjugate was injected subcutaneously three times at 7 day intervals to yield a protein dose per animal of 150 μg. The animals underwent testing for 2 mos beginning with the time of immunization in methods involving alcohol intake, open field trials, hole-board tests, and Y-maze trials. The results demonstrated that immunization with the S-BSA conjugate depressed alcohol intake ('alcoholization') and inhibited the development of conditioned food reflexes and exploratory behavior. Optimum effects in terms of behavioral effects were secured with conjugates containing ca. 30 moles sydnophen per mole of BSA. These changes were reminiscent of some effects seen with neuroleptics and contrary to those obtained with the administration of sydnophen alone, an established stimulant and antidepressant. These observations demonstrated the feasibility of instituting long-term behavioral via immunization with conjugates of CNS drugs. Figures 2; tables 3; references 12: 9 Russian, 3 Western.

UDC 612.821.6+615.78

Effects of Tuftsin on Exploratory Behavior of Albino in Relation to Pharmacologic Interference with Biogenic Amines

18402104B Moscow BIOLOGICHESKIYE NAUKI in Russian Vol 303 No 3, 89 (manuscript received 30 Nov 88) pp 70-75

[Article by N. Yu. Sarycheva, V. N. Kalikhevich, A. A. Kamenskiy and T. I. Vlasova, Joint Laboratory, Biological Faculty, Moscow State University]

[Abstract] Outbred rats (150-200 g) were employed in a study designed to further assess the neurotropic activity of tuftsin, using the board-hole method for evaluation of exploratory activity. Tuftsin (0.3 mg/kg) was administered intraperitoneally 5 min, 4 h or 24 h prior to testing. The effects were variable and time dependent. Administration of tuftsin 5 min before testing led to a statistically significant enhancement of exploratory activity, administration 4 h before testing had no telling effect, and in the 24 h experiment significant depression of exploratory behavior was evident. Determinations of brain levels of biogenic amines revealed that 5 min after tuftsin administration there was an insignificant decrease in norepinephrine and dopamine levels and elevation of serotonin. However, after 24 h depression of norepinephrine and dopamine was significant, while serotonin was unaffected. Administration of tuftsin to animals pretreated with various drugs that affect the biogenic amines demonstrated that the effects of tuftsin were to some measure mediated via catecholaminergic mechanisms, but that the dopaminergic mechanism were more significant. Tuftsin restored to baseline levels animal behavior perturbed by injection of drugs interfering to some extent with the dopaminergic system. Figures 1; tables 3; references 15: 12 Russian, 3 Western.

UDC 681.3+612.8

Computer Automation of Memory Research

18402104C Moscow BIOLOGICHESKIYE NAUKI in Russian Vol 303 No 2, 89 (manuscript received 2 Dec 88) pp 102-112

[Article by A. P. Kulaichev, Chair of Higher Nervous Activity, Moscow State University]

[Abstract] A brief survey is presented of recent developments in the application of computer technology to research on memory conducted at the behavioral, cellular, and molecular levels. In particular, description is provided of the GRASS-KAMEKS-STATIS harware-software conveyor developed at Moscow State University, consisting of three interrelated multifunctinal systems. The GRASS system (GRaphic ASSistant) utilizes a color monitor for visual display with attendant cards and other supportive elements. The KAMEKS component deals with recording of various parameters and signals, controls the experimental equipment, and regulates delivery of mechanical, electrical, chemical or some other form of stimuli. Finally, the STATIS system represents a dialog approach to the processing of experimentally derived data. Tables 3; references 6 (Russian).

UDC 616.12-082(470+571)

Report on the Board of RSFSR Ministry of Health

18402114D Moscow ZDRAVOOKHRANENIYE ROSSIYSKOY FEDERATSII in Russian No 4, 1989 pp 44-46

[Article by L. Yu. Pavlova, board secretary]

[Abstract] The Board considered the current state of cardiological services in the RSFSR in order to identify problem areas and ensure further improvements in this branch of health care. Currently, in the RSFSR 25 institutions provide ambulatory cardiac care; recently the Leningrad Scientific Research Institute of Cardiology and its Saratov branch were opened. In addition, the entire health system includes 1,800 cardiological teams, while 25 interoblast cardiosurgical centers manage patients requiring cardiovascular surgery. There are currently 5,500 cardiologists in the RSFSR. However, a careful review has revealed serious shortcomings in many aspects of the cardiological services and in the plans that have been made for expansion. The morbidity of heart disease is on the increase, including an increase in pediatric cases. Accordingly, measures have been taken to expand the network of ambulatory services and to create in Moscow an institute specializing in atherosclerosis and a specialized center for rheumatic heart disease in children. In addition, the Board also recognized the need to improve the cardiological programs at the Daghestan, Bashkir, and North Ossetian medical institutes.

UDC 576.312.33:577.39:599.82

Late Mutagenic Effects in Somatic Cells of Monkeys Due to Low-Dose Ionizing Irradiation

18402084B Kiev TSITOLOGIYA I GENETIKA in Russian Vol 23 No 1, Jan-Feb 89 (manuscript received 15 Sep 87) pp 14-20

[Article by L. P. Kosichenko, Scientific Research Institute of Experimental Pathology and Therapy, USSR Academy of Medical Sciences, Sukhumi]

[Abstract] Late mutagenic effects in somatic cells were monitored in rhesus monkeys 4 to 19 years after a course of low-dose irradiation from a Co^{60} source. The male and female monkeys were irradiated at the age of 2 to 4 years with daily doses ranging from 0.046 to 0.0417 Gy per day for up to 6 years and 8 months, for total doses of 8.26 to 36.77 Gy. The spontaneous levels of chromosomal aberrations in control animals were (per 100 cells) 1.28 in bone marrow cells, 1.64 in renal epithelial cells, and 1.5 in peripheral lymphocytes. These observations revealed the high susceptibility of somatic cells to low-level ionizing radiation. The bone marrow cells and peripheral lymphocytes showed a predominance of symmetrical chromsomal translocations and pericentric inversions. Acentric fragments, on the other hand, predominated in the renal epithelial cells. These cytogenetic observations demonstrated that in the rhesus macaque long-term sequelae of low-level ionizing radiation persist for at least 15-19 years. Tables 5; references 21: 1 Yugoslav; 12 Russian, 8 Western.

UDC 615.33.076.7:578.833.26

Testing Antibiotics for Activation of Occult Tick-Borne Encephalitis Virus Infections

18400573E Moscow VOPROSY VIRUSOLOGII in Russian Vol 34 No 2, Mar-Apr 89 (manuscript received 2 Dec 87) pp 197-200

[Article by G. V. Malenko and V. V. Pogodina, Institute of Poliomyelitis nd Viral Encephalitides, USSR Academy of Medical Sciences, Moscow]

[Abstract] A study was conducted to identify antibiotics with the spectrum of activity of streptomycin and tetracycline but failing to activate tick-borne encephalitis (TBE) virus. The experimental approach consisted of subcutaneous infection of Syrian hamster with TBE virus, followed by treatment in 60 to 348 days with florimycin, levomycetin, or kanamycin. Administration of the antibiotics for three weeks was combined with TBE virus recovery studies and monitoring of the immune response by passive hemagglutination. The resultant findings demonstrated that levomycetin administration to a total dose of 540 mg did not active TBE virus in the hamsters. Kanamycin (180 mg) and florimycin (360 mg) exerted a weak activating effect, leading to isolation of the virus from 5% of the tissue samples. However, there was no significant immunosuppression nor a clinically manifested disease process. Neverthless, the viral isolates obtained from the brain on the 205th days and from the spleen on the 348th day were more virulent than the original strain. Figures 1; tables 3; references 12: 11 Russian, 1 Western.

UDC 616.98:578.833.26]-092.9-07

Effects of Immunosuppression on Acute Lassa Virus Infection in Mice

18400573G Moscow VOPROSY VIRUSOLOGII in Russian Vol 34 No 2, Mar-Apr 89 (manuscript received 26 May 87) pp 208-213

[Article by N. D. Barkar, R. F. Maryankova, A. T. Godneva, L. V. Grigoryeva, B. I. Zudin, A. S. Petkevich and I. S. Lukashevich, Belorussian Scientific Research Institute of Epidemiology and Microbiology, Belorussian SSR Ministry of Health, Minsk; State Institute of Standardization and Control of Medical Biological Preparations imeni L. A. Tarasevich, Moscow]

[Abstract] Outbred and inbred mice were employed in a study designed to elucidate the significance of the various components of the immune system in the pathogenesis of Lassa virus infection. The experimental approach consisted of determining the effects of various forms of immunosuppression on the outcome, immune response, and virus distribution. Intracerebral injection of the viral suspension to C3H/SnY mice resulted in systemic distribution. The highest concentration of the infectious virus was detected in the spleen 5 days after aministration. In addition, high titers persisted in the spleen and brain throughout the entire course of infection. Maximum viremia was observed on day 5, diminishing thereafter. Similar patterns were evident in C3H mice following intracerebral and intraperitoneal injection of the Lassa virus. Histopathologic studies revealed that the most extensive lesions occurred in the brain and spinal cord. Studies with CBA mice showed that 250 R x-irradiation of infected mice was without effect on the 100% lethal outcome, whereas 500 R reduced the mortality to 33.0%. In the case of intracerebrally infected outbred mice cyclophosphamide (40 mg/kg/day for 4 days after infection) ensured 100% survival versus 100% mortality in unreated mice. Cyclosporin A, however, was without protective effects. Finally, transfer of immune syngeneic splenocytes protected 30-60% of infected recipient mice. These observations indicate the need for further research to determine the exact nature of immunocompetent cells affecting Lassa virus pathogenesis. Figures 5; tables 1; references 19: 5 Russian, 14 Western.

Medical Absorbents Their Mechanism of Action: 4th Ukrainian SSR Conference (Donetsk, 17-18 November 1988)

18400590 Kiev VISNYK AKADEMIYI UKRAYINSKOYI RSR in Ukrainian No 5, May 89 pp 107-108

[Article by K. S. Ternovyy, deputy minister, Ukrainian SSR Ministry of Health, Kiev, and M. T. Kartel, chief, Laboratory of Synthetic Carbons and Carbonaceous Hemosorbents, Institute of General and Inorganic Chemistry, Ukrainian SSR Academy of Sciences, Kiev]

[Abstract] This conference was attended by over 200 scientists and physicians representing representing leading clinical and research centers in Ukraine and other parts of the USSR. The scientific part of the conference was opened by Academician K. S. Ternovyy, UkrSSR Academy of Sciences, who summarized ten years of progress in the development and clinical applications of charcoal-based hemosorbents. In addition, considerable attention was accorded to the cost effectiveness of hemosorption therapy as a method of detoxication. Detailed coverage was given to the various applications of hemosorption, indications, as well as studies dealing with the mechanisms of action. Unfortunately, despite steady progress in the development of improved hemosorbents at the research centers, problems dealing with large-scale commercial production or hemosorbents and the necessary instrumentation have not been resolved as yet.