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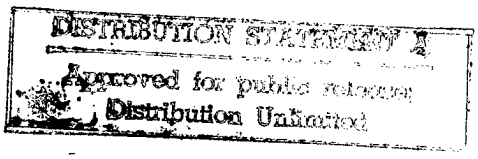

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Science & Technology
USSR: Life Sciences

JPRS-ULS-90-006 *18 June 1990*

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UDC 612.014:796.51(204.1)

Change in Mechanical Muscle Properties During Orthostatic Test Before and After Immersion Hypokinesia

18400623 Moscow VOYENNO-MEDITSINKIY ZHURNAL in Russian No 4, Apr 89 p 58

[Article by Candidate of Medical Sciences A. V. Ovsyannikov, Candidate of Medical Sciences V. G. Kozlova, V. V. Ilnitskiy, and S. V. Dronenko]

[Text] Stay under conditions of real or simulated weightlessness causes a marked decrease in orthostatic stability, which also reflects, in particular, a change in systems controlling various bodily functions. The study of mechanisms of orthostatic instability has not lost its urgency even at present.

A study of mechanical properties of sportsmen's skeletal muscles during a passive orthostatic test before and after simulated weightlessness was the object of our research. Research was conducted with the participation of 16 sportsmen (9 decathlon competitors and 7 gymnasts) aged 21 to 39. The weightlessness effect was simulated through a 3-day "dry" immersion. To evaluate the functional state of skeletal muscles during the orthostatic test, we used the seismomyotonography method (T. I. Fedin, 1985). During an analysis of seismograms we calculated the oscillation frequency, which was taken as the muscle elasticity indicator. We determined the elasticity indicator of tibial and gastrocnemius muscles and the straight head of the quadriceps muscle of the thigh in a horizontal position and during the 1st, 5th, 10th, and 15th minute of the orthostatic passive test, as well as during the 1st, 5th, and 10th minute after its end.

The results of background research have shown that in decathlon competitors in the process of the orthostatic test before the immersion effect the elasticity indicator of the tibial muscle rose significantly, whereas in the gastrocnemius muscle and in the quadriceps muscle of the thigh the investigated indicator hardly changed.

In contrast to decathlon competitors, in gymnasts during the orthostatic test the rise in the elasticity indicator was established not only for the tibial muscle, but also for the medial head of the gastrocnemius muscle of the shin. A similar nature of changes also remained after immersion. However, the values of the elasticity indicator in a horizontal position after the immersion effect were lower and their changes during the orthostatic test were less pronounced than before the immersion.

It is well known that the transition from a passive state of a muscle into an active one is accompanied by a significant rise in the elasticity indicator. In connection with this it can be assumed that even during a passive orthostatic test there is a certain degree of pronounced activity of shin muscles. Gymnasts and decathlon competitors differ fundamentally in the very nature of this activity. For example, whereas a shift in the mass center slightly forward is observed in decathlon competitors and the compensation for this shift occurs at the expense of the tension of the tibial muscle, a shift in the center is not noted in gymnasts and posture correction occurs through the correcting activity of tibial and gastrocnemius muscles, as is the case under normal conditions in an orthograde position.

Therefore, it can be assumed that under conditions of a passive orthostatic test, as a minimum, two methods of regulating the position of the mass center exist: one of them, owing to the activity of the tibial muscle and the other, through the inclusion of all shin muscles. Theoretically, it can be assumed that, all things being equal, the inclusion of additional muscle groups in activity can affect the evaluation of the tolerance for a passive orthostatic test. It is possible that the use of various methods of regulating the position of the mass center was one of the factors affecting the more pronounced decrease in the tolerance for the orthostatic test in decathlon competitors as compared with gymnasts. In connection with this, when performing it, apparently, it is advisable to supervise the state of mechanical or bioelectric properties of skeletal muscles.

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UDC 631.524.86:633.11

Effects of Foreign Cytoplasm on Nonspecific Resistance of Wheat Shoots To Brown Rust

18400473B Minsk DOKLADY AKADEMII NAUK BSSR in Russian Vol 33 No 3, Mar 89 pp 271-273

[Article by A. N. Palilova, Ye. A. Voluyevich and T. A. Parfenova, Institute of Genetics and Cytology, Belorussian SSR Academy of Sciences]

[Abstract] An analysis was conducted on nonspecific resistance to brown rust (Puccinia triticina) of alloplasmic wheat lines bearing Penjamo 62 genome and cytoplasm derived from various species of Triticum, Aegilops, and Agropyron. Assessment was conducted in terms of the effects on the reproductive proclivity of the pathogen. The tabulated data for the results obtained with 19 foreign cytoplasms revealed either enhancement, inhibition, or indifference on the basis of the index of horizontal immunity. The mechanism responsible for the results are poorly understood, although it appears that the genome of the pathogen is subject to modification by cytoplasmic factors introduced into the alloplasmic wheat lines. Tables 1; references 2: 1 Russian, 1 Western.

UDC 581.5.036

Effect of Exogenous Hormones and Protein Synthesis Inhibitors at Low and High Tomato-Damaging Temperatures

18402021b Kiev FIZIOLOGIYA I BIOKHIMIYA KULTURNYKH RASTENIY in Russian Vol 21 No 1, Jan-Feb 89 (manuscript received 5 Oct 87), pp 45-48

[Article by V. V. Talanova and A. F. Titov, Institute of Biology, Karelian Affiliate, USSR Academy of Sciences, Petrozavodsk]

[Abstract] The question of the general patterns of change in processes of temperature damage and recovery of plants with exogenous treatment by metabolism regulators remains open. In this article, experiments were performed with two-week tomato sprouts grown in nutrient solution, with the plants exposed to low temperatures (2°C) and high temperatures (45°C), which have been found to be sufficient to cause damage to tomato plants. The exogenous hormones had a significant modifying effect on the reaction of the tomato sprouts to both low and high temperatures. Abscisic acid and kinetin increased the survival rate, while gibberellic acid and indoleacetic acid decreased it. Pretreatment with gibberellic and indoleacetic acids plus kinetin increased survival rate and intensified biomass accumulation, while abscisic acid was ineffective. Protein synthesis inhibitors decreased the survival rate. The possibility is thus demonstrated of modifying the reactions of tomato plants to damaging temperatures and renewing their activity by means of exogenous hormones and protein biosynthesis inhibitors. Figures 3; References 23: 12 Russian, 11 Western.

UDC 576.851:582.736:133.11

Productivity of Lucerne as Function of Innoculation With New Strains of Rhizobium

18402021b Kiev FIZIOLOGIYA I BIOKHIMIYA KULTURNYKH RASTENIY in Russian Vol 21 No 1, Jan-Feb 89 (manuscript received 25 Mar 88), pp 17-21

[Article by S. Ya. Kots, M. M. Nichik, Institute of Plant Physiology and Genetics, Ukrainian Academy of Sciences, N. V. Peterson, O. V. Romaniv, Lvov Agricultural Institute

[Abstract] Legumes play an important role in the intensification of fodder production in the Ukrainian forested steppe. This article studies the influence of new rhizobium strains on the productivity of lucerne in the western Ukraine. Lucerne was innoculated with eight new strains of rhizobium, plus standard strain 425A, obtained from the All-Union Scientific Research Institute of Agricultural Microbiology. Of the eight new strains, the best was SKhM-148 (*Rhizobium meliloti*), which yielded more green mass with a higher content of protein (17.2 cwt/hectare, or 28.3% more than the control). This strain can be recommended for production of lucerne rhizotrophin. References 12: 11 Russian, 1 Western.

UDC 633.111"324":631.526.32

Kharkovskaya 20, New Soft Winter Wheat Variety

18402020a Moscow SELEKTSIYA I SEMENOVODSTVO in Russian No 2, Mar-Apr 89 pp 31-32

[Article by A. I. Knysh, I. M. Norik, and B. P. Vesna, candidates of agricultural sciences, Ukrainian Scientific Research Institute of Plant Science, Selection and Genetics imeni V. Ya. Yuryev]

[Abstract] A new variety of soft winter wheat, Kharkovskaya 20, was developed at the Ukrainian Scientific Research Institute of Plant Science, Selection, and Genetics and has been regionalized in Chernovitskaya Oblast since 1988. The characteristics of the variety are described. Its resistance to fusariosis, powdery mildew and brown leaf rust are higher than average, and it is less damaged by hessian and swedish flies than average. It is distinguished by its high productivity and is responsive to application of both mineral and organic fertilizers. Application of the proper quantity of seeds is important. A norm of 5-5.6 million seeds per hectare yielded a harvest of 5.51 tons per hectare after corn, 5.74 tons per hectare after peas.

UDC 633.171:631.526.32

Kharkovskoye 57, New Millet Variety

18402020b Moscow SELEKTSIYA I SEMENOVODSTVO in Russian No 2, Mar-Apr 89, pp 35-36

[Article by S. I. Konstantinov, doctor of agricultural sciences, and V. M. Linnik and L. A. Shapina, candidates of agricultural sciences, Ukrainian Scientific Research Institute of Plant Science, Selection and Genetics imeni V. Ya. Yuryev]

[Abstract] The new variety of millet, Kharkovskoye 57, which was developed by crossing the Veselopodolyanskoye 403 and Kharkovskoye 25 varieties (with a 0.025% solution of N-nitrosomethylurea), has been regionalized in the Kharkov, Cherkassy and Odessa oblasts since 1987 and is now also used in the Poltava and Volyn oblasts, and the Dagestan ASSR and North Osetian ASSR. In competitions in 1981-1987, the average yield was 3.88 tons per hectare, 0.35 tons per hectare greater than the standard Mironovskoye 51. In a test in 1983, the yield reached 5.25 tons per hectare. The new variety is responsive to mineral fertilizer. It is distinguished by its great resistance to lodging when planted after plowing with full mineral fertilization.

UDC 632.938.2

Suppression of Potato Resistance by Phytophthorosis Pathogen Immunosuppressors

907C0158B Moscow PRIKLADNAYA BIOKHIMIYA I MIKROBIOLOGIYA in Russian Vol 25 No 4, Jul-Aug 89 (Manuscript received 31 Aug 87) pp 532-539

[Article by G. V. Leonteva, G. I. Chalenko, T. Ye. Medvedeva, N. I. Vasyukova, O. L. Ozeretskovskaya, Institute of Biochemistry imeni A. N. Bakh, USSR Academy of Sciences, Moscow]

[Abstract] Induced susceptibility has been widely studied in the hope that determination of the biochemical principles of disease development from the standpoint of the unique capabilities of pathogens to suppress defense reactions in plants may create the possibility of developing a strategy of plant protection by blocking the mechanisms used by pathogens to suppress resistance in their host. Recent studies have indicated that the factor of virulence in the phytophthorosis pathogen consists of water-soluble low-molecular-mass β-1,3-β-1,6-glucanes, suppressors present in the mycelium and zoospores of the fungus, and also in its excretions. This article studies the participation of the glucane suppressors of phytophthora infestans (Mont) de Bary in the suppression of various types of potato immune response. The interaction of the glucanes with specific receptors on the plasmalemma of the potato cells prevents recognition by the plant of signals arising upon infection of its tissues or mechanical injury, leading to nonspecific inhibition of the immune response, manifested as suppression of at least three types of resistance: race-specific resistance to the phytophtorosis pathogen, species-nonspecific immunity and reaction to injury. Figures 2; References 25: 9 Russian, 16 Western.

UDC 632.95

Selection of Biopesticide-Producing Actinomycetes

907C0158A Moscow AGROKHIMIYA in Russian No 11, Nov 89 (Manuscript received 05 Dec 88) pp 89-94

[Article by D. N. Chermenskiy, A. A. Nepoklonov, G. T. Bryushinina, D. N. Nabiullina, G. B. Ivanova, N. A. Guseva, K. F. Smirnova, L. A. Minayeva, V. S. Minkina, L. A. Golovleva, Institute of Biochemistry and Physiology of Microorganisms, USSR Academy of Sciences, Pushchino, Moscow Oblast]

[Abstract] Results are presented of selection of actinomycete cultures from collections and natural isolates for insecticidal and fungicidal activity. The screening process yielded a number of strains with good activity, particularly strains of Actinomadura spiralis and Streptomyces herbescens, as well as three streptomyces isolated from the soil. Detailed studies are continuing on optimization of the biopesticides produced by these strains and the structure of the compounds which they synthesize. Figures 2; References 12: 6 Russian, 6 Western.

UDC 541.69

Possible Participation of Specific Receptors in Nucleic Acid Transport to Cells

907C0155B Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 308 No 4, Oct 89 (Manuscript received 1 Feb 89) pp 998-1000

[Article by V. V. Vlasov, Ye. A. Deyeva, Ye. M. Ivanova, L. Ya. Yakubov, Novosibirsk Institute of Bioorganic Chemistry, Siberian Division, USSR Academy of Sciences]

[Abstract] Studies of the mechanisms of transport of nucleic acids to eukaryotic cells are interesting for their use in gene therapy as well as in the creation of techniques for delivering nucleic acids and oligonucleotides to suppress the multiplication of various pathogens or to regulate the expression of certain genes. The work reported in this article uses ^{32}P-labelled alkylating derivatives of oligonucleotides to study the proteins of cells which specifically interact with oligonucleotides. It was found that a 30-minute incubation of the cells with a 4(N-2-chlorethyl-N-methylamino) benzylphosphamide reagent resulted in appearance on the electrophoretogram of two labelled proteins with masses of 79 and 95 kDa. Increasing modification time or reagent concentration resulted in the appearance of a large number of other modified products that were probably cellular proteins that are less reactive or less accessible for the reagent. The data indicate that the proteins that were found are receptors that have high affinity and specificity and are capable of recognizing the nucleic acids. They may be responsible for the transport of oligonucleotides and their derivatives to the cell by means of receptor-intermediated enthocythosis. Figures 2; References 10: 4 Russian, 6 Western.

UDC 577.1

Primary Structure of Restriction Endonuclease EcoRII Gene

907C0157B Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 308 No 6, Oct 89 (Manuscript received 3 Apr 89), pp 1497-1499

[Article by V. G. Kosykh, A. V. Repik, A. V. Kaliman, Ya. I. Buryanov, Academician A. A. Bayev, Institute of Biochemistry and Physiology of Microorganisms, USSR Academy of Sciences, Pushchino, Moscow Oblast]

[Abstract] The wide use of restriction-modification enzymes has drawn interest to the structural and functional organization of genes and the possible mechanisms underlying regulation of their expression. The major method used to study these problems is cloning and determination of the primary structure of restriction-modification genes. Many restriction-modification genes have been cloned, and the primary structure has been determined for some of them. The purpose of this work was to determine the primary structure of the gene of restriction endonuclease EcoRII. The primary structure of the DNA methylase gene was previously published. In their determination, the authors use methods advanced by Sanger and by Maxam and Gilbert. With the Sanger method, incomplete hydrolysis was used for mapping sites for splitting the SAu3A restrictase on the BamHI-PstI fragment, and individual fragments were isolated and cloned in the BamHI site of the M13mp8 vector. With the Maxam-Gilbert method, the authors cloned the PstI fragment with methylase and restrictase genes in the pUC19 vector in two orientations. A set of deletion variants was then obtained, and they were immediately used for determining the primary structure of the endonuclease. The primary structure of the gene is given, and it is concluded that the EcoRII restriction-modification system is organized "tail to tail," with reading of genetic information performed from individual promoters on complimentary chains in the direction toward the area between the genes. Figures 4; References 8: 4 Russian, 4 Western.

UDC 577.113.5

Cloning and Sequencing of Bacillus Intermedius RNase Gene

907C0255A Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 309 No 6, Dec 89 (manuscript received 27 Oct 89) pp 1476-1479

[Article by K. M. Nurkiyanova, A. A. Shulga, V. M. Zakharyev, M. P. Kirpichnikov, K. G. Skhryabin and Academician A. A. Bayev, Institute of Molecular Biology imeni V. A. Engelgardt, USSR Academy of Sciences, Moscow]

[Abstract] Cursory technical details are presented on the cloning and nucleotide sequencing of the RNase (ribonuclease T_2) gene of Bacillus intermedius as a precursor for the use of this unique enzyme in biotechnology. In the initial stages the B. intermedius chromosome was subjected to digestion by EcoRI and EcoRI/HindIII restrictases, followed by resolution of the fragments by electrophoresis on 1% agarose and transfer to nitrocellulose filters. A probe consisting of RNase gene of B. amyloliquefaciens incorporated into plasmid pMT416 was used to identify complementary DNA bands in the agarose. A vector pMT316/H2 was created for cloning the isolated DNA in E. coli HB101. Finally, the Sanger method was employed for sequencing leading to the construction of a complete gene map, and identification of the corresponding amino acid sequence of the enzyme. Figures 3; references 11: 6 Russian, 5 Western.

UDC 577.124.5:57.083.13

Supermolecular Structure of Acidic Exopolysaccharide of Obligate Methylotrophe Methylobacillus methylophilius on Gel Formation in Alkaline Media

907C0282a Moscow PRIKLADNAYA BIOKHIMIYA I MIKROBIOLOGIYA in Russian vol 25 No 5, Sep 89 (manuscript received 3 Aug 87) pp 651-657

[Article by S.Yu. Shchegolev, L.A. Starukhina, and V.V. Deryabin, All-Union Scientific Research Institute of Protein Biosynthesis, Moscow]

[Abstract] In order to elucidate possible mechanisms for the reversible isothermal gel formation observed when the pH of a system containing an acidic exopolysaccharide (EPS) isolated from the obligate methylotrophic bacterium Methylobacillus methylophylium is raised, the supermolecular structure of the EPS was studied as a function of ionic composition and pH. Optical density was measured at 400, 450, 500, 550, and 600 nm. It was found that at pH's below gel formation a relatively stable permolecular particle fraction was seen. About 2-5 percent of total mass was found in a dispersed colloidal phase. An increase in supermolecular particle diameter observed at pH 8-9 may be connected with a change in the degree of water immobilization. Assumptions about the pH dependence of swelling (pH8) of the particles, connected with changes in electrical charge of the macromolecule, lead to sufficiently consistent, practically constant particle concentration, as determined by spectroturbidometry. When the gel formation pH, 13.5 for addition of NaOH or 12.8 for addition of $CA(OH)_2$ is reached, precipitous increases in particle diameter and concentration were noted, which could be connected with system phase separation. In the presence of sodium acetate, the concentration of polymeric particles is practically unchanged when NaOH is added to the gel formation pH of 13.2. This indicates coagulation of particles, rather than formation of a new phase. Maintenance of electrical charge due to acetate adsorption may be one of the principal reasons a new phase did not form. The results obtained indicate that the EPS investigated may serve as an alternative to dextran in industrial applications. Figures 3; references 21: 13 Russian, 8 Western

UDC 577.152.344.03:541.182

Enzymatic Synthesis of N-Benzoyl-L-Tyrosine-p-Nitroanilide (BTNA) in Aerosol OT/Water:2,3-Butanediol/Octane System

18400639A Moscow BIOORGANICHESKAYA KHIMIYA in Russian Vol 15 No 5, May 89 (manuscript received 21 Oct 88) pp 634-635

[Article by N. G. Bogdanova, N. L. Klyachko, V. Ye. Kabakov, K. Martinek* and A. V. Levashov, Chair of Chemical Enzymology, Moscow State University imeni M. V. Lomonosov; *Institute of Organic Chemistry and Biochemistry, Czechoslovak Academy of Sciences, Prague]

[Abstract] A reversed surfactant micelle system in organic solvent was used successfully for enzymatic synthesis of BTNA. This approach was selected in order to minimize the water concentration and thereby shift the reaction equilibrium toward peptide bond synthesis. In this case, α-chymotrypsin was employed to catalyze BTNA synthesis by the reaction of p-nitroaniline with N-benzoyl-Tyr-OH in aerosol OT/water:2,3-butanediol/octane, with BTNA obtained in a 30% yield using tris buffer, pH 5.0, with total water concentration limited to 0.01%. Figures 2; references 17: 5 Russian, 12 Western.

UDC 579.841.11:[579.61:616-092].083.1

Isolation of Pseudomonas Aeruginosa Exotoxin A by Immunoaffinity Chromatogaphy

18400605C Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOLOGII in Russian No 4, Apr 89 (manuscript received 28 Jan 88) pp 64-68

[Article by V. A. Vovk and N. A. Uchakina, Scientific Research Institute of Epidemiology and Microbiology imeni N. F. Gamaleya, USSR Academy of Medical Sciences, Moscow]

[Abstract] Cursory technical details are presented on the isolation of exotoxin A from Pseudomonas aeruginosa culture fluid through the use of an immunoaffinity column. The antibodies were raised in chinchilla rabbits and purified on CNBr-derivatized Sepharose 4B columns bearing the exotoxin. Subsequently, the specific antibodies themselves were coupled to CNBr-modified Sepharose 4 B for the preparation of immunoaffinity columns for the isolation of exotoxin A. The columns were equilibrated with isotonic NaCl, pH 7.9; the elution was performed with 0.05 M glycine buffer, pH 2.5; and eluates were collected into 0.5 M tris-HCl buffer, pH 8.0. The yield of exotoxin A was 87% (21 mg) with a working column volume of 25 ml. SDS-polyacrylamide gel electrophoresis led to the identification of a single band with a MW of 71 kD. Figures 4; references 17: 2 Russian, 15 Western.

UDC 615.372:579.852.134+616.98:579.852.134

Structure of Tetanus Neurotoxin and Molecular Mechanisms of Its Interaction with Nerve Cells

18402076 Moscow USPEKHI SOVREMENNOY BIOLOGII in Russian Vol 107 No 1, Jan-Feb 89 pp 106-120

[Article by K. K. Ivanov, Scientific Research Institute of Epidemiology and Microbiology imeni N. F. Gamaleya, USSR Academy of Medical Sciences, Moscow]

[Abstract] Tetanus toxin is highly toxic and lethal at less than 2 ng/kg human body mass. The amino acid composition, sequence of amino acid residues, and conformation of this simple dual-chain protein have been determined. The interaction of the toxin with its receptors is not well understood. The study of the structure of the neurotoxin and the fragments of its molecule produced by limited proteolysis provide some information for an

understanding of the molecular mechanisms of intoxication. Determination of the functionally active domains of the toxin indicates the possibility of developing new therapeutic and prophylactic preparations, including neutralizing, diagnostic, antireceptor and vaccine preparations. Fragments have been synthesized by strains of *E. coli,* the plasmids of which contain a portion of the DNA of *Clostridium tetani* encoding their synthesis. Further and more detailed studies of the structure of the toxin and the neuroreceptors are needed. References 106: 10 Russian, 96 Western.

UDC 577.151.33:577.344

Studies on 13-Cis- and All-Trans- Isomers of 4-Ketobacteriorhodopsin

18400477A Moscow BIOKHIMIYA in Russian Vol 54 No 1, Jan 89 (manuscript received 19 Nov 87) pp 136-139

[Article by L. V. Khitrina and Ts. R. Lazarova, Interfaculty Special Problems Scientific Research Laboratory of Molecular Biology and Bioorganic Chemistry imeni A. N. Belozerskiy, Moscow State University imeni M. V. Lomonosov]

[Abstract] A comparative analysis was conducted on the rates of photoisomerization of 13-cis and all-trans- isomers of 4-ketobacteriorhodopsin (4-KB), employing light flashes delivered by 530 nm laser and halogen lamp sources. The results showed that light exposure of 4-KB leads to both 13-cis- [leads to] all-trans- and all-trans- [leads to] 13-cis isomerizations. The major absorption band for the all-trans-4-KB was at 527 nm, with complete relaxation after a light flash requiring several minutes at room temperature, i.e., much slower than the relaxation time for the 13-cis isomer. Consequently, the time required for the return to the ground state of 4-KB is due to slow rate of transformation of the all-trans-isomer. Figures 2; references 10: 4 Russian, 6 Western.

UDC 577.352.5:577.353

Tetrodotoxin-Sensitive Sodium Channels in Rat Intestine Smooth-Muscle Cell Membrane

907C0157A Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 308 No 5, Oct 89 (Manuscript received 15 Jun 89) pp 1485-1489

[Article by S. V. Smirnov, M. F. Shuba, Institute of Physiology imeni A. A. Bogomolets, USSR Academy of Sciences, Kiev]

[Abstract] Potential-controlled sodium channels have been found in the smooth-muscle cells of the rabbit pulmonary artery and in vascular smooth-muscle cells in rats, along with potential-controlled calcium channels. This article presents data on the presence of potential-controlled tetrodotoxin-sensitive sodium channels in the membrane of the smooth-muscle cells of visceral organs. Experiments were performed on freshly isolated smooth-muscle cells from the intestines of newborn rats (1-3 days old) and mature rats (2-2.5 months old) by the patch-clamp method. The smooth-muscle cell membranes were found to have potential-controlled sodium channels which are highly sensitive to tetrodotoxin and are similar in their amplitude-kinetic characteristics to those described in a giant axon, the heart muscle, and vascular smooth-muscle cells. Figures 4; References 15: 4 Russian, 11 Western.

UDC 577.21

Cloning of Human ApoA1 Gene and its Expression in Murine Fibroblasts

907C0283b Kiev BIOPOLIMERY I KLETKA in Russian Vol 5 No 5, Sep-Oct 89 (manuscript received 10 Mar 89) pp 105-107

[Article by V.N. Shulzhenko, L.L. Lukash, L.N. Shulyak, Ye.V. Usenko, and V.A. Kordyum, Institute of Molecular Biology and Genetics, UkSSR Academy of Sciences, Kiev; Kharkhov Scientific Research Institute of Therapy, UkSSR Ministry of Public Health]

[Abstract] Due to the involvement of its product in the development of atherosclerosis, the human ApoA1 gene was obtained by screening 300,000 recombinent phages using a 40-residue oligonucleotide complementary to a fragment of the gene. The PstI-fragment of phage DNA which gave a positive blot hybridization test with the probe was subcloned into the pUC18 plasmid. Restriction mapping demonstrated the identity of the fragment obtained with the ApoA1 gene. Three molecular constructs were used to study expression: pUC18-Apo and pUC18-Apo', containing the ApoA1 gene with its own promoter in different orientations, and paL1-Apo, containing the polylinker promoter RNA- polymerase III at the BamHI site. Transfection of line LTK$^-$ mouse fibroblasts was conducted. No ApoA1 product protein was observed in cell lysate. Immunoenzyme measurement of ApoA1 in culture medium indicated that maximal secretion was seen on days 3-10 after plasmid introduction. Addition of exogenous lipids did not enhance protein secretion. More secretion was obtained from the paL1-Apo construct, indicating that the ApoA1 promoter is weak. Figures 2; references 5: 2 Russian, 3 Western.

UDC 581.143.6:633.511

Cytogenic Variability of Cotton Callus Tissue Cells

907C0283a Kiev BIOPOLIMERY I KLETKA in Russian Vol 5 No 5, Sep-Oct 89 (manuscript received 5 Jul 88) pp 96-99

[Article by O.Ya. Vesmanova, S.N. Zuyeva, and A.-K.E. Ergashev, Institute for Experimental Biology of Plants, UzSSR Academy of Sciences, Tashkent]

[Abstract] Cytological peculiarities were studied in hypocotyle callus cells from Gossypium arboreum var. salvineum L. during sixteen cell culture passages, each of 21 days duration. The cultures were a homogeneous population of undifferentiated cells with occasional differentiated portions. Isolated, elongated spiral tracheal cells and rings of 5-10 cells were seen in passages 1-2. Vascular bundles were seen in later passages, with their numbers increasing with passage number. Large starch-filled cells were also seen, which became more frequent in later passages. Compact, fine, intensely-staining cells which resembled meristem were encountered, which are probably the morphogenesis zone. Anaphase analysis demonstrated that the number of aberrant cells increased with passage number, with both chromatide and chromosomal aberrations seen. Cariological metaphase analysis revealed genome destabilization, with an increase in tetraploid cells. The high level of heterogeneity in cell composition and chromosome number observed may be due to heterogeneity of the initial tissue culture cells, particularly in phytohormone levels. Figures 1; references 10: 5 Russian, 5 Western.

Bioreactor-89 Exhibit in Moscow

18402163 Moscow MEDITSINSKAYA GAZETA in Russian 12 Jul 89 p 4

[Interview with Professor G. A. Ugodchikov, general director of the Interbranch Scientific-Technical Center Bioreaktor and one of the organizers of the Bioreaktor-89 Exhibit in Moscow, under the rubric "Exhibits": "Going Healthy Into the Twenty-First Century"]

[Abstract] In an interview on the eve of the opening of International Exhibit "Bioreaktor-89" in Moscow Exhibition Complex, Ugodchikov said that the center was established in 1988 under the aegis of the USSR Academy of Medical Sciences and the All-Union Academy of Agricultural Sciences imeni Lenin. The exhibit is one of the means used by the center to solve problems associated with the integration of science, manufacturing and commerce. The goals of the center include the development of medical and food biotechnology equipment, the marketing of computerized bioreactors and drugs, and the creation of joint ventures. Classical fermenters equipped with computerized controls should improve the productivity of the existing processes immensely. Thus far, there are only about ten such projects country-wide. In principle, they could be established rather inexpensively anywhere, preferably close to the products being processed, so as to lower the transportation costs. Plans are in place for the use of Soviet equipment, technology, and raw materials in plants such as a proposed facility for processing milk, juices, vegetables, and fruit near near Warsaw and an herb-processing plant in China. Talks are under way with firms from Algiers and Zimbabwe. There are other companies in other countries active in this area. Ugodchikov says the Soviets are creating an international association involving cooperative scientific and business efforts in the biotechnology associated with the production of food and the protection of the environment. The association will develop promising projects, will facilitate marketing of the products, promote cooperative projects and the training of specialists.

UDC 616.98:579.843.94]-022.9-036.21(575.25)

Haemaphysalis Concinna Ticks and Natural Foci of Tularemia in Pavlodarsk Oblast (Northeastern Kazakhstan)

18402135A Moscow MEDITSINSKAYA PARAZITOLOGIYA I PARAZITARNYYE BOLEZNI in Russian No 2, Mar-Apr 88 (manuscript received 7 Apr 88) pp 77-79

[Article by V. I. Pakizh, N. A. Amirova and N. I. Sergeyeva, Pavlodarsk Oblast Sanitation-Epidemiology Station]

[Abstract] Haemaphysalis concinna ticks are found in the foothills of the Zailiyskiy Alatau, in the Chu and Ili river valleys, and in regions of southern Kazakhstan, but no cases were reported of their involvement in natural foci of tularemia. In 1972 these ticks were noted in Pavlodarsk Oblast near the villages of Maykaragay and Cheka, in Lebyazhinskiy Rayon, which shares a border with the Altay Kray. The two villages are situated in a pine forest belt that stretches from the Ob River, through the Altay Kray to the Irtysh. In 1978 massive collection of these ticks was undertaken after two individuals became infected with tularemia. Over the ensuing 10-year period, 212 cultures of tularemia pathogen were isolated, 124 from 22,412 H. concinna ticks (58.5%). Similar biotopes were noted on the shores of Malybay Lake and Lake Burli and on the slopes to the north of Maraldy lake—areas that are wet, forested territories. Even though miles apart, they were infected with H. concinna ticks epizootic for tularemia. This tick does not confine itself to a particular host and is carried by domestic animals, wild mammals, birds and even reptiles. Parasitic existence of larvae and nymphs lasts from May to September. The epizootic process is long lasting, the number of ticks being maintained on a high level every year. Therefore, it is mandatory to maintain an immune barrier for the local populations near those areas. References: 13 (Russian).

Crimean Hemorrhagic Fever in Kazakh SSR

54001024A Moscow MEDITSINSKAYA GAZETA in Russian 7 Jul 89 p 2

[Article by A. Prokin, special correspondent for MEDITSINSKAYA GAZETA, under the rubric "We Report the Details": "Thnd conditions for irradiation, were developed on the basis of the results of structural investigations combined with research to determine the effect of laser processing on a metal's resistance to abrasion, plastic strain, and coalescence and on the structures' resistance to loss of strength during additional heating.

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UDC 577.113+123.5

Translocation of Vector Plasmids Into Mitochondria of Maize Shoots

18400477C Moscow BIOKHIMIYA in Russian Vol 54 No 1, Jan 89 (manuscript received 28 Feb 88) pp 154-157

[Article by Yu. M. Konstantinov, V. A. Podsonnyy, G. N. Lutsenko and M. I. Rivkin, Siberian Institute of Plant Physilogy and Biochemistry (Irkutsk) and the Institute of Cytology and Genetics (Novosibirsk), Siberian Department, USSR Academy of Sciences]

[Abstract] Autoradiographic studies were conducted on the translocations of plasmids pBR322 and pBR327, commonly used for vector purposes in bacterial systems, into mitochondria isolated from corn shoots. The mitochondria used in the study were isolated from three day old etiolated shoots derived from the Krasnodar 303 TV hybrid line. For the translocation a suspencion of mitochondria (8-10 mg protein/ml) was exposed to 4-8 mcg pBR322 or pBR327 DNA, followed by incubation for 30 min in an ice bath. Subsequent electrophoretic and hybridization studies demonstrated that the plasmids were translocated into the mitochondria. In addition, pBR322 DNA was shown to function as a template for DNA synthesis by mitochondrial DNA polymerase. The data also provided evidence that only covalently closed circular forms of the plasmids were preferentially translocated into the plant mitochondria. These findings suggest that the plant systems may possess unique mechanisms for the uptake of polynucleotides. Figures 2; references 12: 5 Russian, 7 Western.

UDC 616.98:579.842.14]-092.9-085.372

Immunotherapy with Myelopid in Experimental Salmonella Infections

907C0228C Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 8, Aug 89 (manuscript received 6 Jul 88) pp 94-97

[Article by L. Ya. Osmanova and N. I. Gurariy, Scientific Research Institute of Epidemiology, Microbiology and Infectious Diseases, Uzbek SSR Ministry of Health, Tashkent]

[Abstract] CC57W mice, 16-18 g, were employed in a study designed to assess the effects of myelopid (B-activin) on T and B cells in conjunction with Salmonella typhimurium infection. The animals were injected intraperitoneally with 2000 bacterial cells, with the experimental animals treated subcutaneously with 6 μg/mouse of myelopid 2 days after infection. Monitoring of the animals for 30 days revealed that myelopid exerted a stimuatory effect on T cell counts in the blood, thymus, spleen, and lymph nodes, with maximum elevation seen on day 14. In the control mice injection of S. typhimurium led to T cell depression over the 30-day period of observations. Analysis of B cell status showed a similar stimulatory effect which peaked on day 7, and exceeded the stimulatory effect seen in infected control mice, which also peaked on day 7. Studies with an erythrocytic diagnostic reagent showed that myelopid enhanced the appearance of antigen-binding lymphocytes in the blood, spleen, and lymph nodes, but led to depletion of their levels in the thymus. In general, the effects of myelopid were evident within 2 days of administration and point to an immunostimulatory effect in experimental salmonellosis in mice. References 15: 8 Russian, 7 Western.

UDC 615.371:579.881.11].015.2:615.339:578.245].07

Effects of Interferon and Interferon Inducers on Immunogenicity of Typhus Vaccines

907C0228B Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 8, Aug 89 (manuscript received 25 May 88) pp 57-60

[Article by V. A. Pshechnichkov, Yu. N. Malinkin., V. V. Mikhaylov and V. P. Kuznetsov]

[Abstract] Trials were conducted on the effects of human leukocyte inteferon and interferon inducers (polyI:C, tyloron) on the immunogenicity of typhus vaccine in monkeys and guinea pigs. Studies on guinea pigs showed that polyI:C and tyloron enhanced the formation of complement-binding antibodies against subcutaneously administered chemically-inactivated typhus vaccine when the inducers were given in combination with the vaccine or after the vaccine. Basically, the inducers favored an earlier antibody response and prolonged its duration, and to a lesser degree increased the titer. PolyI:C was somewhat more effective, especially when given 2 h after the vaccine in a dose of 4 mg/kg. Treatment of Maca mulatta monkeys with subcutaneous interferon over a 10-day period, beginning 2 h after vaccine with a live or killed vaccine, showed a beneficial effect in terms of hemagglutinating antibodies against the killed vaccine. There was virtually no effect with the live vaccine, except for a somewhat earlier appearance of the hemagglutinating antibodies. In addition, both types of vaccine induced a weak response of complement-fixing antibodies, which was slightly potentiated by interferon in the case of the killed vaccine. References 14: 7 Russian, 7 Western.

UDC 616.98:579.841.11]-092-085.322-036.8-07

Protective Effects of Preparations From Plant Shoots in Experimental Pyocyanic Infection

907C0228A Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 8, Aug 89 (manuscript received 26 May 88) pp 12-14

[Article by R. M. Khaitov, V. V. Sergeyev, M. I. Gubarev, S. I. Yelkina and V. B. Beylina, Institute of Immunology, USSR Ministry of Health; Central Scientific Research Institute of Vaccines and Sera imeni I. I. Mechnikov, USSR Academy of Medical Sciences, Moscow]

[Abstract] Immunostimulant factors identified as triterpene glycosides, isolated from oat (IF-1) and wheat (IF-2) seedlings, were tested for their efficacy in protecting 14-16 g outbred mice from Pseudomonas aeruginosa. IF-1 or IF-2 were injected intraperitoneally in doses of 100 or 1000 μg/mouse 2 or 7 days before an intraperitoneal challenge with 1 or 10 LD_{50} Ps. aeruginosa cells. Essentially, 100% survival figures were obtained when the animals were challenged with 1 LD_{50} dose of Ps. aeruginosa. Evaluation of the survival data demonstrated that IF-1 was a more efficient agent than IF-2. The ED_{50} of IF-1 was 157 μg/mouse when administered 7 days before infection with a 10 LD_{50} bacterial dose, and 32 μg/mouse when injected 2 days before the bacterial challenge. The corresponding ED_{50} values for IF-2 were 1015 and 1300 μg/mouse when administered 7 and 2 days before infection. In addition, IF-1 and IF-2 are easily extracted, nontoxic, inexpensive, and can be prepared in large quantities, considerations that make them attractive immunostimulants. References 10: 9 Russian, 1 Western.

UDC 615.33:578.245].017:615.277.3].076.9

Experimental Antitumor Effect of Domestic Preparation of Recombinant α_2-Interferon (Reaferon)

907C0130b Moscow VOPROSY VIRUSOLOGII in Russian Vol 34 No 3, May-Jun 89 (manuscript received 3 Nov 87) pp 312-315

[Article by L. A. Lavrukhina, T. A. Posevaya, I. F. Barinskiy and F. I. Yershov, Institute of Virology imeni D. I. Ivanovskiy, USSR Academy of Medical Sciences, Moscow]

[Abstract] The goal of this study was to evaluate the antitumor effects of reaferon (α_2-interferon) administered alone or preceded by a vaccination on a model of a herpes-induced tumor in hamsters. The authors also studied the effect of the administration on the interferon status of the animal body, i.e., the set of indices for circulating serum interferon and the indices for α- and γ-interferon in response to viral or nonviral induction. Syrian hamsters (strain EH/A-44) bearing tumors induced by cells transformed by HSV-1 DNA were used. The interferon was administered intraperitoneally in a total dose of 5 x 10^3IU/ml. One group of animals served as untreated controls; the second group received one dose of reaferon prior to transplantation of tumor cells and then four more daily doses; the third group was immunized with a lysate of killed tumor cells before transplantation of the tumor cells; and the fourth group was also immunized with the lysate, was inoculated with the tumor, and was then treated with reaferon on the same schedule as the second group. The best results were obtained in group four, as shown by longer latent period of tumor development (as of day 113, some 75% of the animals had not developed tumors), smaller overall tumor size, and increased survival time. In groups 2 and 4, α- and γ-interferon levels in the blood and the spleen were 2-4 times higher than normal after the reaferon administration schedule ended. At the same point, α- and γ-inteferon production had ceased in the control group and was lower than that in groups 2 and 4 in group 3. On the basis of these findings it was recommended that reaferon be used in combined therapy, especially in malignancies in which herpes virus is involved as the etiologic factor. Figures 2; references 9: 6 Russian, 3 Western.

UDC 612.112.94.017.1.015.46:615.919:579.852.11

Susceptibility of Mouse Immunocompetent Cells to Bacillus Anthracis Toxin

18400605E Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOLOGII in Russian No 4, Apr 89 (manuscript received 9 Mar 99) pp 104-105

[Article by T. D. Cherkasova and V. A. Abalakin, Central Scientific Research Institute of Epidemiology, USSR Ministry of Health, Moscow]

[Abstract] Immunocompetent cells derived from CBA mice (18-20 g) were tested for their susceptibility to Bacillus anthracis exotoxin through determination of cAMP concentration. Incubation of the selected cells with the toxin showed that the increase in cAMP in peritoneal and splenic macrophages was some tenfold greater than in lymphocytes derived from the spleen and lymph nodes and in T-cells. Heat-inactivated toxin was ineffective. These observations demonstrated that macrophages are especially susceptible to the B. anthracis exotoxin and confirm other studies showing similar susceptibility.

UDC 76.851.42:616.371

Influence of Brucellosis Vaccine on Production of α- and γ-Interferon in Mice

18402090B Ashkhabad IZVESTIYA AKADEMII NAUK TURKMENSKOY SSR: SERIYA BIOLOGICHESKIKH NAUK in Russian No 1, Jan-Feb 89 (manuscript received 29 May 87) pp 69-71

[Article by N. V. Pak, R. D. Aspetov, M. G. Bostandzhyan, N. K. Kaliyeva, B. Kh. Zhumatova, M. L. Beylbayeva, Kazakh Scientific Research Institute of Epidemiology, Microbiology and Infectious Diseases; Turkmen State Medical Institute]

[Abstract] A study is made of the immune-modifying properties of brucellosis vaccine in mice, based on the ability of lymphocytes to produce α- and γ-interferon. Production of interferon was studied in a culture of splenocytes from albino, outbred mice (18-20 g) after treatment with brucellosis vaccine, and also in intact mice. Staphylococcal enterotoxin A was used for the induction of the γ-interferon, Newcastle virus for the α-interferon. Injection of the vaccine increased the production of interferon by the lymphocytes both in vitro and in vivo, but it did not stimulate production of virally induced interferon. References 9: 6 Russian, 3 Western.

UDC 616.98:579.841.93]-085.339:578.245]-036.8

Reaferon in Combined Treatment of Brucellosis

18402085B Moscow TERAPEVTICHESKIY ARKHIV in Russian Vol 61 No 2, 89 (manuscript received 17 May 88) pp 119-120

[Article by K. B. Kurmanova, V. P. Saltykov, R. Zh. Aspetov, Scientific Research Institute of Epidemiology, Microbiology and Infectious Diseases, Kazakh Ministry of Health, Alma-Ata; Central Scientific Research Institute of Epidemiology, USSR Ministry of Health, Moscow]

[Abstract] A study is made of the tolerance and therapeutic effectiveness of reaferon (Soviet-made α-interferon) in combined treatment of brucellosis. The treatment was performed on 10 patients (9 males and 1 female) who were 16 to 45 years of age and who had mild, recurrent, chronic brucellosis resistant to ordinary therapy. After each injection of reaferon (1 million units i/m, 5 injections at intervals of 3 days), the patient's temperature rose for a variable period of up to 6 hours following the first injection, 2 hours following subsequent injections. The patient's condition subjectively and objectively improved after 2 to 3 injections. Significant improvement was observed in 6 patients and moderate improvement in 4 after the total course of treatment, with disappearance of symptoms, normalization of body temperature, regression of inflammatory processes, reduced or eliminated lymphoadenopathy, restoration of physical and mental working capacities and improvement of compensatory capabilities. The results thus indicate that the treatment is well tolerated and promising. References 4: 3 Russian, 1 Western.

UDC 613.62:621.375.826]-084.3

Estimating the Economic Benefits from Eliminating Exposure of Workers to Laser Radiation

907C0104 Moscow ZDRAVOOKHRANENIYE ROSSIYSKOY FEDERATSII in Russian No 7, Jul 89 (manuscript received 12 Mar 88) pp 36-39

[Article by V. A. Kashuba and V. G. Butova, Moscow Medical Stomatological Institute imeni N. A. Semashko]

[Text] The improvement and protection of public health is an economic category that plays an important role in the creation of national income and the personal consumption fund.

The evaluation of the final result, the state of health, is proposed as a key criterion in evaluating the effectiveness of health care work.

Workers' health is determined by a multitude of interrelated factors and depends directly upon the state of the environment and the production sphere. That state depends upon the degree to which sanitation and hygienic measures are implemented. At present the most urgent task is the optimization of production activities, above all, the implementation of the fundamental principle of hygiene—the elimination of the exposure of workers to harmful production and occupational factors. [5] However, methodological approaches to the search for criteria for the efficiency of introducing that principle in the national economy are not reflected in the literature.

The goal set was to determine the criteria and, on their basis, to calculate the expected economic effect from implementing measures to completely eliminate the exposure of personnel servicing lasers to laser radiation. The effects of laser radiation on worker health can be eliminated by using various technical and hygiene protective devices for on the laser units.[1,2]

With its indisputable technical and economic advantages, new progressive laser technology is having an ever increasing influence upon various fields of science, technology and the national economy. According to our calculations, more than 200,000 persons in the USSR are now working with laser devices and instruments, while about 1 million people have periodic contact with laser radiation. It is urgent that we solve the problems associated with the protection of the labor and health of personnel by radical means that eliminate the effect of a number adverse production and occupational factors.

The methodological approach proposed here for calculating the economic benefits expected from the introduction of radical hygienic measures to eliminate the harmful effects of laser radiation upon workers' health is based upon a calculation of the direct and indirect eonomic costs. The costs for periodic medical examinations and laboratory diagnostic tests required by USSR Ministry of Health Order No. 700 of 1984 for individuals who have contact with laser radiation constitute a direct economic loss. A direct loss also stems from the payment of social insurance to workers disabled by illness and injury. An indirect economic effect stems from reduced labor time losses, increased production, reduced or eliminated compensation or awards given to workers injured by harmful and dangerous production factors, in particular, laser radiation. We will examine these economic effects in more detail.

We did not find in the literature any data on the cost of annual medical examinations regulated by USSR Ministry of Health Order No. 700 of 1984 and directed toward preventing occupational illnesses. According to this order, individuals having occupational contact with laser radiation should be annually examined by a therapist, neuropathologist, opthamologist and gynecologist who use the following laboratory and functional tests: EKG, clinical analysis of the blood (erythrocytes, thrombocytes, leukocytes, and differential blood count). In our calculations we include the effects of only one harmful factor—laser radiation—although a number of adverse production-occupational factors have been recorded.[1,2] As a result of them, examinations must be performed by 5-6 physicians twice a year.

The cost of one visit to a physician in any speciality in an outpatient facility is 1 ruble 26 kopecks.[7] Consequently, it costs 378 rubles to have 100 workers who use lasers visit 3 doctors each. More than half the workers are females. It costs 63 rubles to have them visit their obstetrician-gynecologist. Laboratory and diagnostic tests of 100 workers who use laser devices cost the state 130 rubles (65 kopecks per test).[7] The total annual economic cost for periodically examining 100 laser workers is at least 571 rubles.

Medical service costs for this group include preventive medications. In accordance with RSFSR Ministry of Health methodological regulations "Labor Hygiene for Work with Lasers" (1981), the health and treatment-and-prevention measures for those working with lasers include taking vitamins during the winter and spring; glutaminic acid and aminalon for 2-6 months; and cascarilla [eleuterokokk]. The cost of the above recommended preventive medicines is given in the table.

Cost of Preventive Medications for Laser Workers

Preparation	Cost per package	Number of packages per course of treatment	Cost of course of treatment of 100 workers
Aerovit	1 ruble 30 kopecks	6	780 rubles
Aminalon	0 rubles 82 kopecks	4	328 rubles
Cascarilla [eleuterokokk]	0 rubles 40 kopecks	3	120 rubles
Glutamic acid	0 rubles 14 kopecks	15	225
Total	—	—	1,453 rubles

Thus, preventive medicines cost 1,453 rubles per 100 workers. If the influence of laser radiation on health is eliminated, laser workers do not need to have periodic medical examinations or take preventive medicines. This group is provided with ongoing dispensary observation and preventive services in accordance with USSR Ministry of Health Order No. 770 of 1986. The health effect of radical technical and hygienic measures can be expressed by indicators showing the level and nature of illnesses and injuries. Industrial injuries in the form of burns by laser radiation at industrial enterprises average three cases annually per 100 workers. On the average, eight work days are lost per injury. This leads to economic losses totalling 875 rubles 28 kopecks of lost output for the three injuries, as each industrial worker creates 36 rubles 47 kopecks of national income per work day.[3] The economic losses in the form of social insurance during disability are 188 rubles 16 kopecks per three injuries, based upon an average payment of 7 rubles 84 kopeck. The total annual economic loss prevented due to the elimination of laser-caused industrial injury is 1,063 rubles 44 kopecks per 100 workers.

We have established that in the group of workers having occupational contact with laser radiation, the annual morbidity with temporary disability involves 241 days of lost work per 100 workers, 26 days more than for the control group (who did not have contact with laser radiation). If harmful contact with laser radiation is eliminated, the annual lost time due to illness among these workers can be reduced to that of the control group. The economic losses prevented by reducing payments for disability documented by doctors' certificates would equal 203 rubles 84 kopecks, and the production losses prevented would equal 948 rubles.

The total annual expected benefits obtained from completely eliminating the health effects of laser radiation involving illness, injury, and medical and preventive services are 4,238 rubles per 100 workers. The operators' compartment that has been suggested to eliminate the effects of laser radiation costs 300 rubles and has a 20-year service life, making a total annual cost of 1,500 rubles per 100 workers.

Personnel servicing lasers in the 3rd and 4th danger class have perquisites in the form of 6-12 days of additional leave (depending upon the specific class of laser) and can additional pay amounting to 10-24 percent of their wages. The annual costs of such benefits average 24,000 rubles per 100 workers, while the national income lost because of goods not produced during the additional leave totals 36,470 rubles per 100 workers per year.

Thus, the total expected annual economic benefits from eliminating the adverse effects of laser radiation on service personnel are 64,708 rubles per 100 workers. Typically, the greatest material costs result from the benefits given to people who come into contact with harmful factors.

With the transition to cost accounting, self-financing and strict limits upon enterprise wage funds, implementing hygienists' requirements to improve working conditions is not only necessary, but also advantageous. Thus, the economic benefits from eliminating the adverse health effects of radiation are 431 rubles annually for each ruble invested.

This methodological approach reflects the importance of objectifying the economic role of a progressive process for optimizing laser operators' working conditions. A precise evaluation of the economic benefits of radical preventive sanitation-hygiene measures at each specific industrial facility requires the introduction and calculation of additional indicators for income and expenses, in particular, the growth in labor productivity due to health improvements. Our approaches to evaluating possible benefits from eliminating the adverse effects of radiation upon personnel are ready for use by medical doctors, health care organizers, economists and specialists in protecting labor as guidelines for evaluating their own activities.

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UDC 616.24-002.1-085.849.19-032:611.14]-036.8-07

Intravenous Laser Therapy in Combined Treatment of Acute Pneumonia

907C0186 Moscow SOVETSKAYA MEDITSINA in Russian No 7, Jul 89 (manuscript received 3 Oct 88) pp 22-26

[Article by I. M. Korochkin, T. K. Platonova, G. M. Kapustina, A. M. Belov and O. G. Alekseyeva, Laboratory of Tissue Preservation and Transfusion Studies, Scientific Research Institute of Emergency Medical Care imeni N. V. Sklifosovskiy, Municipal Clinical Hospital No. 13, Moscow]

[Abstract] The effectiveness and mechanism of action of the intravenous laser treatment of acute pneumonia was studied on 70 patients aged 17 to 72 (41 men, 29 women). The individuals received laser therapy along with the standard treatment (antibacterial and antihistamine preparations, expectorants, mucolytic agents and vitamins) and were compared with a group of 25 controls who were given standard treatment only. Inclusion of the intravenous laser therapy improved therapeutic results by accelerating resolution of pneumonia, diminishing the frequency of complications and shortening the course of the condition. Hemostasis became normal much faster, along with a much faster restoration of blood circulation in the zone of pneumonic damage. During the initial stage of acute pneumonia, activation of the coagulation system was noted as well as a drop in antithrombocytic potential; antiproteinase potential increased. Optimal exposure for this intravenous laser irradiation was 30-40 min at 10-15 mW. The therapy was initiated immediately upon admission and was repeated 5 times per week up to a total of 8-10 sessions over a two-week period. References 26: 19 Russian, 7 Western.

UDC 616.12-009.72-085.382:615.849.19.03]-036.8-07

Intravenous Application of Low-Energy Helium-Neon Laser in Unstable Angina Pectoris

907C026B Moscow SOVETSKAYA MEDITSINA in Russian No 8, Aug 89 (manuscript received 21 Oct 88) pp 17-19

[Article by A. P. Ionin and E. G. Volkova, Chair of Therapy and Functional Diagnostics, Ural Institute of Postgraduate Medicine; Medical Emergencies Municipal Hospital, Chelyabinsk]

[Abstract] Further studies were conducted on the efficacy of intravascular low-intensity helium-neon laser (HNL) treatment of unstable angina pectoris, encompassing a cohort of 115 males, 25-75 years of age, including 69 with a history of myocardial infarction. The patients were divided into groups managed by conventional chemotherpy and the intravenous HNL + chemotherapy combination (LG-38 laser, 1.5 mW power output at 2 W/cm^2 for 1 h; 7 procedures). Comparison of the two groups showed complete abatement of anginal attacks in 20% of the control patients and in 65.6% of the HNL + chemotherapy patients. Furthermore, 68.9% of the latter patients ceased taking nitroglycerin, versus 20% of the control patients. Cardiac function tests provided additional evidence of the beneficial effects of HNL in unstable angina pectoris, including more efficient ventricular activation. References 15: 13 Russian, 2 Western.

UDC 616.12-009.72-085.849.19-06-084

Prevention of 'Secondary Exacerbation' in Angina Pectoris by Helium-Neon Laser Therapy

907C0268A Moscow SOVETSKAYA MEDITSINA in Russian No 8, Aug 89 (manuscript received 9 Nov 88) pp 14-16

[Article by I. M. Korochkin, A. V. Kartelishev, G. V. Babushkina and G. M. Kapustina, No 4 Chair of Internal Diseases, 2nd Moscow Medical Institute imeni N. I. Pirogov]

[Abstract] A factor limiting more extensive use of helium-neon laser (HNL) treatment of angina pectoris has been the onset of 'secondary exacerbation' after 5-7 HNL procedures. In order to overcome this problem clinical trials were conducted with α-tocopherol and ayevit [as published] (tocopherol + vitamin A) in conjunction with HNL to determine whether this particular side effect of HNL therapy can be obviated by such combination. Studies on 86 patients with angina pectoris, 30-80 years old, showed that daily administration of 600 mg ayevit, coinciding with routine HNL therapy (0.4-0.5 mW for 1-2 min per cardiac projection zone, 12-18 procedures) gave the best clinical results in terms of abatement of secondary exacerbation. Based on the classification of the Canadian Association of Cardiologists, 100% improvement was observed in patients with class II angina pectoris, in 98% of class III patients, and in 8% of class IV patients. References 6 (Russian).

UDC 617.735-007.17-085.849.19

Mechanism of Action of Laser Stimulation of Eye

907C0273A Odessa OFTALMOLOGICHESKIY ZHURNAL in Russian No 4, 89 (Manuscript received 10 Mar 88) pp 213-216

[Article by V. F. Shmryeva, O. P. Pankov, and A. M. Kotlyarskiy, All-Union Scientific Research Institute of Eye Diseases, USSR Ministry of Public Health]

[Abstract] A study is made of the functional status of the lymph system and visual function of the eye in pathology under the influence of helium-neon laser stimulation. Laser stimulation was performed on 26 eyes of 15 patients with dystrophic disease of the eye. Laser stimulation was performed by a series-produced type LGN-203 helium-neon laser with a power density at the output of 0.05- 0.5 mw/cm^2, not exceeding the minimum power

authorized for clinical use in ophthalmology by the Ministry of Public Health. All patients reported subjective improvement in vision on the second day after laser stimulation. Increases were observed in all lymph circulation characteristics in all cases. Figures 3; References 5: Russian.

UDC 616.132.2+616.136.7]-089.844:615.849.19.03

Percutaneous Laser Angioplasty of Small-Caliber Coronary and Renal Arteries

907C0188 Moscow KARDIOLOGIYA in Russian Vol 29 No 5 May 89 (manuscript received 5 Jul 88) pp 100-103

[Article by R. S. Akchurin, A. A. Belyayev, A. P. Savchenko and Ye. V. Pomerantsev, All Union Scientific Cardiology Center, USSR Academy of Medical Sciences, Moscow]

[Abstract] Successful application of laser angioplasty became possible only after development of specialized catheter technology for propagation of light that made it possible to deliver adequately strong illumination to the damaged segment of the vascular channel and allowed development of a wide hemodynamically effective channel comparable in size to the initial diameter of the vessel, while permitting safe manipulation and continuous monitoring of the angioplasty process. Proper catheters were constructed assuring effective reconstruction of lumen during intraoperative and percutaneous rechanelling of the peripheral arteries as well as in intraoperative angioplasty of coronary arteries during surgical revascularization of the myocardium. There were no vascular perforations in these operations. Based on this, coronary artery rechannelling was performed using a percutaneous approach. Two successful case histories were reported: one involving angioplasty of coronary arteries, one of the renal arteries. In the latter case additional balloon dilation was required for removal of the stenosis remaining after laser irradiation. Figures 1; references 3 (Western).

UDC 621.373.826:612.054.44

Effect of Infrared Radiation on Cornea

907L0032B Moscow KVANTOVAYA ELEKTRONIKA in Russian Vol 16 No 10, Oct 89 pp 2136-2140

[Article by A.S. Podoltsev and G.I. Zheltov, Institute of Physics, BSSR Academy of Sciences, Minsk]

[Abstract] The action of infrared radiation pulses on the human cornea is evaluated by numerical solution of the equation of transient heat conduc-tion for a stack of four disks forming an axisymmetric cylinder 0.590 mm high and 12 mm in diameter, with homogeneous initial conditions and boundary conditions of the third kind at the frontal surface of the cornea. The latter consists of four layers: a 0.055 mm thick endothelium with a Bowman membrane under a 0.006 mm thick teardrop film, a 0.489 mm thick stroma, and a 0.60 mm thick Descemet membrane with endothelium on a 3.110 mm thick layer of moisture. The radius of the entire affected region sufficiently large so as to make the temperature at the lateral surface of this cylindrical stack at the end of the cooling period after a pulse equal to the physiological temperature of the cornea. The problem is solved by the difference factorization method on a nonuniform space-time grid with an economical locally-uniform approximating scheme of finite differences. The results of this solution for radiation pulses of 0.75 μs to 1.0 s duration from a CO_2-laser operating at the 10.6 μm wavelength are accurate within +/-28.3%. The temperature dependence of the rate constant of protein denaturation needed for calculations has been determined on the basis of "in vivo" measurements of the threshold energy density. That threshold energy density of laser radiation necessary for causing the smallest visible change in the cornea structure is found to depend exponentially on the pulse duration, with the temperature rise at the center of the spot under threshold conditions peaking later during longer pulses. A laser beam with a Gaussian radial intensity distribution was used in the experiments and assumed for the theoretical analysis. Calculations for pulses of 1.54 μm and 2.795 μm laser radiation agree closely with experimental data. Figures 3; tables 1; references 17.

UDC 617-001.4-002.3-022.7-085.849.19-036.8-07:617-001.4-078

Laser Action on Clinical Isolates of Stpaphyloccus Aureus

18400605F Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOLOGII in Russian No 4, Apr 89 (manuscript received 28 Mar 88) pp 108-109

[Article by B. G. Sarkisyan, L. K. Bagdasaryan, A. K. Enfendzhyan, S. S. Agamalyan and A. S. Agabalyan, Scientific Research Institute of Proctology, Armenian SSR Ministry of Health, Yerevan]

[Abstract] Trials were conducted with Staphylococcus aureus isolated from a patient with a pyogenic infection to assess the susceptibility of the isolate to He-Ne and CO_2 lasers. The colonies were irradiated on solid media with a focused beam adjusted to cover individual colonies. Exposure to the action of He-Ne laser LG-75 (20 mW) for 20 min was without effect; a 1 h exposure killed 15% of the cells and diminished hemolytic activity of 10% of the surviving cells. Irradiation for 2 h led to a 70% kill rate and loss of hemolytic and lecithinase activities in 50 and 20% of the surviving cells, respectively. Irradiation of the colonies with 400 mW/cm^2 CO_2 laser for 1, 3, and 10 min yielded respective kill rates of 83, 94.4, and 98.3%. With the 10 min exposure 30% of the surviving cells showed diminished hemolytic activity, while coagulase and lecithinase activities remained unaffected. With 50 W/cm^2 CO_2 laser action 95% of the cells were killed with a 0.5 sec exposure, and 100% with a 1 sec exposure.

UDC 577.391.621.375.8

Effect of Infrared Laser Action on Cerebral Aspartate Aminotransferase (AAT) and Glutamate Dehydrogenase (GDH) in Rats

18400604G Moscow RADIOBIOLOGIYA in Russian Vol 29 No 2, Mar-Apr 89 (manuscript received 21 Mar 88) pp 274-276

[Article by A. T. Pikulev, T. N. Zyryanova, V. M. Lavrova and I. P. Khripchenko, Belorussian State University imeni V. I. Lenin, Minsk]

[Abstract] In view of the demonstrated therapeutic efficacy of low-intensity infrared lasers, a study was conducted on metabolic sequelae in rats following exposure of the parietal aspects of the head to such radiation. Experiments with 150-200 g outbred rats showed that the activities of ATA and GDH in the brain were unaffected by irradiation for 5-15 min by an LG-126 He-Ne laser with a power flux density of 16 or 80 mW/cm^2. However, irradiation for 20 min elevated the activities of AAT and GDH considerably, with a greater effect obtained with the higher-intensity coherent radiation. In conjunction with information in the published literature, these changes may well reflect secondary phenomena in glutamic acid metabolism attendant to the effects of He-Ne laser action on the neuroendocrine system. References 12 (Russian).

UDC 577.391.621.375.8

Effect of He-Ne Laser on Chemiluminescence of Mouse Splenic Cells

18400604D Moscow RADIOBIOLOGIYA in Russian Vol 29 No 2, Mar-Apr 89 (manuscript received 23 Jun 88) pp 230-234

[Article by T. Y. Karu, T. P. Ryabykh, G. Ye. Fedoseyeva and N. I. Puchkova, Scientific Resarch Institute of Technical Lasers, USSR Academy of Sciences, Troitsk; All-Union Oncological Scientific Center, USSR Academy of Medical Sciences, Moscow]

[Abstract] Splenocytes obtained from 3- to 4-month-old male (CBA x C57Bl)F_1 mice were used in an analysis of the effects of low intensity He-Ne laser action on cellular chemiluminescence, a parameter known to reflect generation of active oxygen. The data showed that He-Ne laser action enhanced both background chemiluminescences and chemiluminescence induced by the presence of heat-killed Candida albicans cells. In both cases a linear dose-response relationship prevailed over a 100-300 J/cm^2 laser dose, with maximum stimulation obtained with a dose of approx. 200 J/cm^2. Although the chemiluminescence on addition of C. albicans was much greater than the baseline chemiluminescence, and the effects of laser action were far more pronounced when active phagocytosis of the yeast was under way, enhancement of baseline and yeast-induced chemiluminescence was on the order of 180-200%. The demonstration that low-intensity He-Ne laser action enhances chemiluminescence suggests that it may well possess immunomodulatory action. Figures 3; references 14: 6 Russian, 8 Western.

UDC 616-001.17-005.1-089

Efficacy of Infusion-Transfusion Therapy in Burns Complicated by Blood Loss

18402106B Kiev KLINICHESKAYA KHIRURGIYA in Russian No 3, 89 (manuscript received 22 Jan 88) pp 46-48

[Article by N. I. Atyasov, A. N. Belyayev, I. V. Begoulov, V. I. Makhrov, N. V. Nemechkin and S. A. Kozlov, Chair of General Surgery, Mordovian State University imeni N. P. Ogareva, Saransk]

[Text] Outbred dogs, 6-24 kg in weight, were employed in an assessment of the therapeutic efficacy of infusion-transfusion in 3rd to 4th degree thermal burns followed by 30-35 ml blood loss. The untreated, anesthetized dogs died within an average of 42 min with severe deterioration of hemodynamic parameters. Retransfusion of blood promoted a limited recovery of hemodynamic indicators amd prolonged the survival time to an average of 10 h, with the route of infusion (intraarterial, intravenous, intraosteal) having no telling effect. Finally, retransfusion in combination with intravenous polyglucin (30 ml/kg)—to twice the volume of the blood loss—prolonged the survival time 2.5-fold to a mean of 1,415 min. Clinical trials on 50 patients at the Mordovian Burn Center demonstrated that inclusion of 400-800 ml of intravenous polyglucin improved the arterial BP by 2.7 kPa, systolic volume by 20-40%, and the central venous pressure by 4.9-5.9 kPa. Rheopolyglucin and gemodex [gemodes] were less effective in the burn cases. References 9 (Russian).

UDC 617.576-001.4-022-09

Use of a Controlled Abacterial Medium in Management of Infected Hand Wounds

18402033A Moscow ORTOPEDIA, TRAVMATOLOGIYA I PROTEZIROVANIYE in Russian No 1, Jan 89 (manuscript received 26 Feb 88) pp 4-7

[Article by V. V. Kuzmenko, A. A. Lazarev and S. S. Kopenkin, Chair of Traumatology, Orthopedics and Military Field Surgery, 2nd Moscow Medical Institute imeni N. I. Pirogov]

[Abstract] Therapeutic trials were conducted with sterile isolation hoods (Sterishield) to assess their performance in facilitating healing of open, infected hand wounds. The experimental studies were conducted on 30 patients; control data were derived from 208 patients with similar infected wounds, but managed conventionally without reliance on the hoods. In the majority of cases, preops for autologous skin transplants involved setting the hood temperature at 28-30°C and pressure to 0.66-1.33 kPa (5-10 mm Hg). The pressure was increased to 3.3 kPa (25 mm Hg) for 30 sec at 15 min intervals to improve the circulation in the hand. In addition, the commercially available hoods were modified to allow a humidity of 65-75% within the hood. In most cases the wounded hand was subjected to hood treatment for an average of 6.6 or 7.8 days. Dressing was avoided when the hand was in the hood. Regular schedules of hand and finger exercises were maintained, as well as other treatment modalities such as ultrasonic aerosol therapy. The results demonstrated that implementation of sterile hoods reduced the preparatory time for plastic surgery three-fold by an average of 14.8 days, and increased the area of viable takes of skin autotransplants by 10%. References 11: 10 Russian, 1 Western.

UDC 616-099-089

Experience in Extracorporeal Detoxification in Acute Exo- and Endotoxicoses

18402108 Kiev KLINICHESKAYA KHIRURGIYA in Russian No 3 1989 (manuscript received 23 Feb 88) pp 67-68

[Article by N. I. Akhunbayeva, I. A. Ashimov and K. A. Tokarskiy, Department of Surgery, Faculty of Advanced Training for Physicians, Kirgiz Medical Institute, Frunze]

[Abstract] Experience gained on 100 extracorporeal detoxifications (60 hemodialyses, 30 hemosorptions, 6 combinations of both procedures and one lymphosorption) performed on 70 patients (43 acute exotoxicoses and 57 acute endotoxicoses) showed excellent clinical results in 42.8%, adequate findings in 45.8% and unsatisfactory results in 11.4% of those studied. The hemodialysis was performed on the domestic artificial kidney machine SGD-1 with a membrane dialyser DIP-02-02. Hemosorption was performed with SKN type sorbents using an arteriovenous shunt. The only problem that would have to be faced would be the nonavailability of the equipment and the complexity of the procedures themselves.

UDC 616.379-008.64:085.835.3-036.8-07

The Role of Hyperbaric Oxygenation in the Complex Treatment of Type I Diabetes Mellitus Patients

18400643C Moscow VESTNIK AKADEMII MEDITSINSKIKH NAUK SSSR in Russian No 5, May 89 (manuscript received 31 Sep 88) pp 70-76

[Article by S. N. Yefuni, I. M. Kakhnovskiy, All-Union Scientific Center for Surgery, Moscow; 1st Moscow Medical Institute imeni I. M. Sechenov]

[Abstract] During decompensation of diabetes mellitus, the prerequisites for the dissolution of O_2 in the lipoprotein ultrafilm that covers the surface of capillaries and erythrocytes, the formation of plasma thrombi, and the development of intravascular stasis of the blood are created. Research has shown that hyperbaric oxygenation effectively and quickly eliminates or reduces many forms of hypoxia in decompensating diabetes mellitus.

In addition to traditional therapy, the test group underwent hyperbaric oxygenation. Treatment effectiveness was evaluated using hormone levels and gas content in the blood, cellular metabolism, oxygen transport function of the erythrocytes, and microcirculation. The majority of patients experienced significant improvement. Use of hyperbaric oxygenation in treating patients with decompensated diabetes mellitus permits the gases and acid-base equilibrium of the blood to be normalized, the oxygen transport function of erythrocytes to be increased, lipid and protein metabolism and cellular metabolism to be improved, the residual function of beta cells in the pancreatic glands and reception of insulin to be stimulated, and consumption of exogenous insulin to be reduced. References 15: 7 Russian, 8 Western.

Immobilized Enzymes in Medicine

18400611 Riga NAUKA I TEKHNIKA in Russian No 7, Jul 89 pp 12-14

[Article by Ilmara Arvidovna Vina and Aerna Stepanovna Karsakevich, Laboratory of Biotechnology of Enzymes, Institute of Microbiology imeni A. Kirkhenshteyn, LaSSR Academy of Sciences]

[Abstract] Enzyme immobilization—i.e., sorptive or chemical bonding of enzyme molecules with natural or synthetic polymer carriers, or the incorporation of those molecules into a polymer structure—was first done some twenty years ago. Immobilization improves the stability of enzymes, prolonging the healing effect of preparations in the body. The authors here detail the various beneficial uses of enzymes in medical treatment and diagnosis, and they discuss some of the apparatus used in enzyme immobilization. One of the most widely used types of enzyme reactors is the fermenter—enzyme electrodes with amperometric or potentiometric detection of the compounds being analyzed. Two types of glucose analyzers which use immobilized enzymes have been developed in the Institute of Biochemistry of the LiSSR Academy of Sciences and are now in use. The Eksan-G unit is used for rapid analysis in diabetic sections of clinical hospitals and for massive screening of the population to monitor blood glucose levels and detect diabetes mellitus in its early stages. The Eksan G-1—a lightweight, easy-to-use model—is used by the individual to monitor blood glucose levels at home; it is also used by emergency medical care units and in village clinics. Express analyzers will soon be manufactured for other metabolites, such as alcohol (Eksan-A), lactate (Eksan-L), urea (Eksan-U), and cholesterol (Eksan-Kh).

UDC 617-001.17-08-036.8-07:612.017.1

Effects of Open Treatment Approach on Immune System in Patients With Deep Burns

18400600B Moscow KHIRURGIYA in Russian No 4, Apr 89 (manuscript received 22 Jun 88) pp 109-112

[Article by L. O. Shkrob, L. V. Yelagina, T. N. Lukoyanova and M. G. Lagvilava, Laboratory of Microbiology, Immunology, and Clinical Pharmacology, Department of Thermal Burns, Institute of Surgery imeni A. V. Vishnevskiy, Moscow]

[Abstract] An analysis was conducted on the immune status of 56 patients with deep burns. They ranged in age from 18 to 67 years and had 3rd to 4th degree burns over 20-65

of body surface. Thirty of the patients were managed by conventional means and 26 by Klinitron air support. In the latter case the patients were supported by a sterile air cushion at 36-38°C and a flow rate of 0.6 m/min with maximum pressure at point of bed contact of 10-15 mm Hg, with the exception of the head and heels, where the contact pressure was 35 mm Hg. Monitoring of cellular and humoral immunity showed that the latter form of management maintained immunity at a more optimal level and facilitated earlier recovery of normal baseline values. Klinitron management enhanced the levels of 'active' T lymphocytes 11-20 days after the trauma, including elevation of theophylline-resistant T cells (helper cells), and acted to reduce the counts of theophylline-senstive T cells (suppressors). In addition, the concentration of circulating immune complexes was reduced by Klinitron treatment in comparison with conventional management in that timeframe, and the levels of IgE and IgG were reduced closer to control values. These findings demonstrated that deep thermal burns have an adverse effect on the immune system that is partially reversed by employing air support in the management regimen. References 17: 9 Russian, 8 Western.

Biological Heart Valve Protheses

Moscow GRUDNAYA KHIRURGIYA in Russian No 5, Sep-Oct 89 pp 97-97

[Unattributed article on inside and outside back cover of GRUDNAYA KHIRURGIYA]

[Text] Research associates at the Kemero Cardiosurgery Center of the Institute of Cardiovascular Surgery imeni Bakulev at the Moscow Higher Technical School imeni Bauman have developed a bioprosthesis from a porcine aortal complex on a functional support frame—the biological heart valve prosthesis, or BHVP.

The BHVP has small axial dimensions and high-efficiency hemodynamic characteristics, is biologically inert, is mechanically reliable, and is designed to correct aortal, mitral, and tricuspid valve failure.

Clinical testing of the bioprosthesis has been performed in the country's leading cardiosurgery centers since 1978, on more than 270 patients.

The USSR Ministry of Health Commission for New Equipment has permitted series production of the bioprostheses since 1989; the production is carried out jointly by the laboratory of heart valve and vascular

bioprostheses of the Kemero Cardiosurgery Center and the Arkhont scientific-production cooperative.

In terms of basic characteristics, the BHVP is on a par with the bioprostheses produced by the leading foreign forms; some of its characteristics are even superior.

The Kemero Cardiosurgery Center guarantees the quality of the bioprostheses. Each prosthesis has a serial number and a manufacturer's certificate listing the basic characteristics verified in bench tests. The price of one unit is 395 rubles.

New Techniques for Pancreatic Surgery

907C0180 Moscow VECHERNYAYA MOSKVA in Russian 30 Oct 89 p 2

[Interview with Professor Valentin Mikhaylovich Buyanov, head of the department of general surgery of the Second Medical Institute and USSR State Prize winner, under the rubric "Perestroyka: Quality of Medicine": "Taming the 'Touch-Me-Not': Surgeons in Recent Years Have Created Effective Methods for Treating the Pancreas"]

[Abstract] This interview with Professor V. M. Buyanov, Honored Scientist of the RSFSR and USSR State Prize Laureate, discusses new techniques for surgical treatment of pancreatic conditions. The gland's inaccessibility, which has earned it the name "touch-me-not," led to the use of drugs as the treatment of choice for various conditions. Surgical intervention, however, is now more easily performed with the endoscope. A special probe is inserted into the organ by a doctor observing its movement on the screen of an x-ray machine. This technic can be used to remove scars and stones or introduce medication without opening the abdominal cavity. Another method, for diagnosis as well as treatment, makes use of the laparascope—a thin tube with an optical device on the end of it, inserted through a small hole made in the abdominal wall, which is locally anesthetized. For pancreatitis, the authors developed a method of catheterization of the pancreatic blood vessels for sure delivery of high concentrations of the medication to specific parts of the pancreas. Another technique the authors discussed involves drainage of the cervical lymph duct, to prevent entry of the lymph and the poisons that develop in acute pancreatitis into the blood stream. When surgery is still necessary, a number of new operations can be used to save the gland. The inflammatory process can be stopped by delivering quick-setting polymers containing medications to the pancreas using a special "counter block" polymer, which has been patented in more than 10 countries. When there is danger of inflammation spreading into surrounding tissues, the entire gland may be wrapped in a polymer film to interrupt the process. The gland may also be cooled or even frozen with liquid carried in a small bulb attached to a laparascope. Surgical treatment methods using laser beams are now under development. The laser improves the blood circulation of the pancreas and increases the effectiveness of medication, while strengthing the immune system. Until quite recently, fatal outcomes of pancreatitis were common. Today, even in severe cases the survival rate is excellent. The new methods have saved tens of thousands of patients. Several dozen physicians go through postgraduate training every year in Buyanov's department.

UDC 617.731-085.844-036.8

Indications for use of Direct Electrostimulation of Optic Nerves in Patients With Pathology in Chiasmal-Sellar Region

18402076c Moscow VESTNIK OFTALMOLOGII in Russian Vol 105 No 2, Jan-Feb 89 (manuscript received 8 Apr 89 pp 33-37

[Article by A. N. Shandurina, V. A. Khilko, M. I. Kondratyeva, I. M. Nikolskaya and A. G. Shchitov, Scientific Research Institute of Experimental Medicine, USSR Academy of Medical Sciences and Military Medical Academy imeni S.M. Kirov, Leningrad]

[Abstract] A new method was developed to improve visual function in patients with pathology of the chiasmal-sellar region of the brain. The method is based on direct electrostimulation of the optic nerves through implanted electrodes. Detailed methodology was reported in earlier papers by Shandurina, Khilko and Matveyev (1984-1985). Experience gained on 143 patients was described. This method should be used on patients with chiasmal-sellar tumors (such as hypophysis adenomas, craniopharyngiomas, and meningiomas of tubercle), optochiasmal arachnoiditis, or damage to the optic nerve in the bony canal in severe cranio-cerebral traumas. Depending on the duration and extent of injury, this method led to improvement in vision in about 66% of the patients studied. References: 14 (Russian).

UDC 615.356;[615.322:582.866].03:617-001.036.8

Experimental Wound Healing Trials with Ayekol (Synthetic Sea Buckthorn Oil)

18402033B Moscow ORTOPEDIYA, TRAVMATOLGOIYA I PROTEZIROVANIYE in Russian No 1, Jan 89 pp 32-36

[Article by E. V. Kostrikova, Kharkov Institute of Orthopedics and Traumatology imeni M. I. Sitenko]

[Abstract] Ayekol, a synthetic sea buckthorn oil developed jointly at the Kharkov Institute of Orthopedics and the Kharkov Polytechnical Institute, has undergone experimental therapeutic trials at eight leading clinical centers in the USSR. The animal studies demonstrated that ayekol is an effective wound healing agent that is nontoxic, non-allergenic, and non-irritating. It has also been shown to behave as an immunostimulant

enhancing, among other factors, complement levels, neutrophil phagocytic activity, and phytohemagglutinin-mediated blast transformation by lymphocytes. Production of ayekol on a commercial scale has been started at the Ufa Vitamin Plant, with a price tag for 100 ml that is threefold lower than the cost of oil extracted from the sea buckthorn. References 14: 12 Russian, 2 Western.

Skin Automicroflora Test for Evaluating Health

907C0312 Moscow VECHERNYAYA MOSKVA in Russian 1 Dec 89 p 2

[Interview with Aleksandr Aleksandrovich Ivanov, doctor of medical sciences, by B. Samoylov, under the rubric "Perestroyka: The Quality of Medicine": "Diagnosing With...Microbes"; first paragraph is source introduction; next four paragraphs are journalist's lead-in to interview]

[Text] ***We live among the invisible, but actually existing world of microbes. Our health often depends on our mutual relationship with them.***

The doctor momentarily pressed a small laboratory glass slide covered with a gelatinous film against my hand. Then he placed the slide into a thermostat and said:

"Tomorrow we'll know your state of health and your level of immunity, that is, the degree of your body's resistance to infections."

You can understand the interest and anxiety I had the next day when I walked into that same office of the Institute of Biophysics of the USSR Ministry of Health. The glass slide from yesterday lay on the table. On its emerald-green surface, embedded white particles were visible. Doctor Ivanov explained that they were sprouted colonies of microbes taken from the skin of my hand. It was on them that the diagnosis and prognosis were based. Fate was nice to me—I'm healthy now and will be for the near future. At any rate, that's what the diagnosis was from the slide.

I'm talking at the moment with Doctor of Medical Sciences A. Ivanov, the head of the group that worked on the new method.

SAMOYLOV: Aleksandr Aleksandrovich, you have advanced a new method for assessing the health of an individual. What is the sphere of its possible application?

IVANOV: We have named the method the "skin automicroflora test." It makes it possible to objectively evaluate the state of the counter-infection resistance of the human body. Such a test is always needed, both in everyday life and in unusual circumstances.

This method provides answers to the following questions: what is the state of health of the individual at present, and what is the probability of the individual's becoming sick with an infectious illness? The test makes it possible to screen so-called risk groups, in order to carry out preventive measures with those very people. There is also a variation of the test that does the opposite—it can single out the most healthy people when individuals are being chosen for, say, spaceflight or descent into the underwater world.

SAMOYLOV: What's the essence of the method you have advanced?

IVANOV: In his day-to-day existence, the individual encounters billions of microbes everyday. There are two variations of interaction. Either the individual uses his own protective forces to maintain the growth of microbes or kill them, or, when there is weak protection, the microbes multiply uncontrollably, causing infectious diseases. In the course of a great deal of experimental work, it has been proven that there is an extremely intimate connection between the state of health of the individual and the number of microbes living on his skin. A square centimeter of skin usually has a given number of microbes living on it. When the individual is sick, that number changes.

Our method is bloodless and safe and does not cause any unpleasant or painful sensations for the patient, which is especially important in pediatric practice. A small plate with a nutrient medium on it is pressed against the skin for just an instant and is placed in a thermostat for a day. After 24 hours, easily differentiated colonies of microorganisms spring up on the surface of the nutrient medium. Then the scales of those "settlements" are determined.

The method is inexpensive. Our calculations show that the cost of one analysis, based on all the expenses, is about 50 copecks.

The prognosis is accurate within roughly a month before the disease becomes apparent. No other test for laboratory diagnosis or prognosis can do that. Thus, we can foresee and predict many illnesses.

SAMOYLOV: Can AIDS be detected with your method?

IVANOV: One of the main signs of AIDS is reduced counter-infection resistance and the development of various diseases in connection with that. Our method is capable of identifying people with immune deficiency, but, unfortunately, it cannot reflect the nature of that deficiency. But the test can be a good signal of a defect in the immune system. The final word, however, is with immunologist and virologists, of course.

SAMOYLOV: Have you already used the new method in broad-ranging clinical practice?

IVANOV: We have used the new method to examine more than 10,000 people and to assess their health. About 10

of them were placed in a high risk group. Upon our recommendation, physicians placed them under special observation. When necessary, preventive drug therapy was used. As a result, no one from the risk group became ill. Now we are introducing this method in various of the

country's medical institutions. The Soviet-Swiss joint venture Khoros has also shown interest in the method. At present, negotiations are under way concerning joint work.

Magnetic Ceramic Spheres Enhance Effect of Medications

907C0151B Moscow MEDITSINSKAYA GAZETA in Russian 30 Jul 89 p 4

[Article by A. Chirva, a TASS correspondent, for MEDITSINSKAYA GAZETA, under the rubric "Here and There: Briefs on Various Topics": "The Healing Magnet"]

[Text] Scientists at the Institute of Materials Science Problems of the Academy of Sciences of the Ukrainian SSR have succeeded in combining seemingly uncombinable things: ceramics and magnets.

"By adding iron oxides and certain rare earth metals, ceramic can be endowed with excellent magnetic properties," explains A. Karasova, a scientific associate at the institute. "Magnetoceramic materials have a very wide variety of uses, but their greatest impact is in medicine."

Blood is known to carry medication throughout the entire body and not just to affected areas. Sometimes after the medication is localized in the inflamed zone, viruses can get accustomed to the drug. Additional stimulators may be necessary. This function can be performed by magnetoceramic spheres applied to a wound or a tumor. The external magnetic field helps provide a comprehensive attack on the disease.

Physicians who have used this new treatment are eagerly ordering magnetoceramic spheres at the institute. However, various problems arise in this connection. The technology for manufacturing magnetic spheres is simple and does not require much equipment. The product cost is relatively low. This fact seems to scare away potential producers.

However, these difficulties did not stop the young developers. They arranged for direct contacts with the Center for Scientific and Technical Creativity Among Young People at Sumy. They plan to set up the production firm Kemag there before the end of the year to satisfy consumer demand.

UDC 616-001.4-002.3-08:541.183

Treatment of Purulent Wounds with Polyphepan

907C0262 Leningrad VESTNIK KHIRURGII IMENI I. I. GREKOVA in Russian Vol 144 No 8, Aug 89 (manuscript received 19 Aug 88) pp 42-45

[Article by Docent M. A. Katsadze, T. I. Isakova, Candidate of Medical Sciences A. G. Miroshnichenko, Candidate of Medical Sciences L. A. Smirnova, Candidate of Medical Sciences, G. A. Zryachikh, T. A. Boyko and Z. N. Gvozdova, Departments of Emergency Medicine and of Microbiology, Leningrad Institute of Postgraduate Medicine imeni S. M. Kirov; No 17 Municipal Hospital "V Pamyat 25 Oktyabrya"; "Gidrolizprom" Scientific Production Association]

[Abstract] Therapeutic trials were conducted with polyphepan powder, a product of lignin hydrolysis, as an adsorbent in the management of postoperative and nonpostoperative purulent wounds. The studies were conducted on 60 subjects, the majority of whom were 17-59 years old. Initially, polphepan was poured directly into the wound but, because of difficulties encountered in its removal, it was subsequently poured on gauze packing. Subjective and objective clinical improvements were noted within 2-3 days, and after 3-4 days new granulation tissue was evident and surgical closure was commenced. Polyphepan was also shown to exert an antimicrobial effect, reducing bacterial recovery by 57%. These findings indicate that polyphepan deserves consideration for routine use in the treatment of purulent wounds. References 13 (Russian).

UDC 616.831-073.97+616.831-07:681.31

Use of Structure of EEG Component Interaction for Computerized Diagnosis of Pathological States of the Brain in Psychiatry

907C0164 Moscow ZHURNAL NEVROPATOLOGII I PSIKHIATRII IMENI S. S. KORSAKOVA in Russian Vol 89 No 6, Jun 89 (manuscript received 12 Jan 88) pp 92-98

[Article by G. V. Sidorenko and S. I. Soroko, Laboratory of Neurocybernetics, Department of Ecological Physiology, Scientific Research Institute of Experimental Medicine, USSR Academy of Medical Sciences, Leningrad]

[Abstract] Computer-assisted discriminant analysis of EEG patterns in healthy individuals, manic-depressives, schizophrenics, and in cases of psychoorganic syndrome was show to be a viable diagnostic approach. Examination of a total of 123 patients and comparison with healthy control subjects demonstrated that, in the single-channel mode with 16 variables, a 60% accuracy applied to schizophrenia, 71% to manic-depressive psychosis, 61% to the psychoorganic syndrome, and 90% in confirming absence of pathology. In the 8-channel mode with 128 variables the respective diagnostic accuracy rates were 75%, 67%, 78%, and 80%. These findings yet again confirmed the utility of computer-assisted EEG interpretation in defining certain forms of neuropathology and in demonstrating that δ- and β-waveforms were the key discriminant factors in these conditions. Figures 1; references 33: 18 Russian, 15 Western.

UDC 575.224.46+577.344.2

Long-Wave Solar Ultraviolet Weakens Mutagenic Effect of Short-Wave Ultraviolet on Bacillus Subtilis Cells

907C0155A Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 308 No 4, Oct 89 (Manuscript received 6 Feb 89) pp 989-993

[Article by O. V. Lotareva, V. D. Filippov, Institute of Evolutionary Morphology and Ecology of Animals imeni A. N. Severtsov, USSR Academy of Sciences, Moscow]

[Abstract] The question of the nature and effectiveness of antimutagenic protective processes in irradiated cells has become increasingly important as a result of the damage to the ozone layer and the global increase in medium-wave ultraviolet radiation. Evolving in the presence of solar radiation with a UV component, all cellular forms of life have developed special mechanisms that counteract the mutagenic effects of UV light. Organisms have a system of excision reparation that frees DNA from cyclobutane dimers in stages. In addition, irradiated cells of many microorganisms, plants, and animals have been found to exhibit enzymatic photoreactivation, an important evolutionary acquisition that places the antimutagenic process outside a dependence on endogenous energy sources (enzymatic splitting of dimers uses the energy of photons of the longer-wave component of the solar spectrum. Studies have shown that a group of transformed bacteria (Bacillus subtilis, pneumococci, and hemophilic bacteria) does not have enzymatic photoreactivation. It is unclear whether this leads to a reduction in the antimutagenic potential of these organisms. The authors suggest that there is another mechanism for utilization of longer-wave radiation to neutralize the mutagenic effect of UV. In order to verify this hypothesis, they studied the influence of filtered sunlight on mutagenesis induced by UV radiation in B. subtilis. The sunlight was found to reduce the mutagenic effect of UV radiation, probably due to inhibition of DNA replication under the influence of UV-A. In their natural environment, the bacteria may be exposed to the mutagenic effect of medium-wave UV-B, the damaging influence of which on the DNA is considerably less than that of shorter-wave UV, particularly UV_{254}. Figures 2; References 11: 2 Russian, 9 Western.

UDC 658.588:582.288

Micromycetes on Industrial Polyamide Materials

907c0077A Vilnius TRUDY AKADEMII NAUK LITOVSKOY SSR: SERIYA V—BIOLOGICHESKIYE NAUKI in Russian No 2, Apr-Jun 89 (manuscript received 27 May 87) pp 10-22

[Article by D. K. Lukshayte, A. Yu. Lugauskas and K. K. Sadauskas, Institute of Botany, Lithuanian SSR Academy of Sciences]

[Abstract] Various polyamide materials were exposed to the elements under climatic conditions prevalent in the Neringa region, Lithuania, to assess colonization by micromycetes. Observations in 1981-1985 demonstrated that the condition of storage was the key factor determining the predominant fungal contaminant. In open-field trials the predominant genera were represented by Alternaria alternata, Aureobasidium pullulans, Trichoderma viride; but Aspergillus niger, Cladosporium herbarum, Stemphylium ilicis, and Ulocladium atrum were isolated frequently. Polyamide materials stored in sheds bore A. alternata, Asp. niger, A. pullulans, C. herbarum, and Penicillium cyclopium. In unheated warehouses the primary contaminants consisted of P. cyclopium, P. nalgiovensis, Asp. niger, and P. steckii. In addition, Asp. niger, P. cyclopium, and A. pullulans were frequently isolated from polyamide materials subjected to a combination of storage conditions representing all of the above. Melanin-producing micromycetes predominated on materials subjected to storage both in open fields and sheds. Determinations of micromycete growth kinetics on Czapek's medium supplemented with polyamide as a carbon source demonstrated that kinetic parameters may be used to assess susceptibility of polyamide materials to biodegradation by various micromycetes. Figures 11; references 19: 1 Polish, 12 Russian, 6 Western.

UDC 579.222.2:547.53

Utilization of Dimethylterephthalate by Rhodococcus Erythropolis

18400610 Minsk DOKLADY AKADEMII NAUK BSSR in Russian Vol 33 No 5, May 89 (manuscript received 18 Aug 88) pp 467-470

[Article by A. S. Samsonov and Z. M. Slizen', Institute of Microbiology, BSSR Academy of Sciences]

[Abstract] The great promise held by microbiological methods for protecting the environment serves as the reason for the intensive research being conducted on the microbe destruction of xenobiotics such as phthalic acid esters, which are widely used in the industrial production of plastics and synthetic fibers and are large-scale environmental pollutants. Phthalic esters are mutagenic, teratogenic, and carcinogenic, which makes their presence in the environment and in the food chain a serious problem. Attempts to destroy the dimethyl ester of terephthalic acid with bacterial cultures that are active against esters of *o*-phthalic acid have been unsuccessful, a fact that served as the basis for the research here involving the production of microorganisms that destroy dimethylterephthalate (DMT) and the study of the utilization of that ester. A bacterial strain capable of using DMT as its only source of carbon was isolated from soil contaminated the ester. A culture that was produced from it used DMT, terephthalate, benzoate, *n*-oxybenzoate, pyrocatechin, and protocatechuate as its sole source of carbon. The strain produced was similar to Rhodococcus erythropolis and was called DSS-14. The DMT metabolic rate and the buildup of intermediates in

the process of its use by Rhodococcus erythropolis were studied using gas chromatography and spectrophotometry. As DMT is metabolized, terephthalate and protocatechuate are liberated and the pH changes from 7.5 to 7.2 after 44 hours. TCX analysis of the products of DMT metabolism revealed three more compounds, whose molecular mobilities matched those of monomethylterephthalate, terephthalate and protocatechuate. Benzoic and n-oxybenzoic acid may be among other intermediate products which are quickly metabolized by the culture. Figures 2, references 8: 3 Russian, 5 Western.

UDC 579.843.95:579.253].04

Mutagenic Effect of Polymorphonuclear Leukocytes on Yersinia Pestis

18400605A Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOLOGII in Russian No 4, Apr 89 (manuscript received 10 Feb 88) pp 10-14

[Article by B. B. Atchabarov, Zh. M. Isin and B. M. Suleymenov, Central Asian Scientific Research Antiplague Institute, USSR Ministry of Health, Alma-Ata]

[Abstract] In vitro studies were conducted on the effects exerted by guinea pig neutrophils obtained as peritoneal exudate cells on the variability of Y. pestis. The animals had previously been immunized with Y. pestis EV. The neutrophils and either Y. pestis 224 (leu^-) or Y. pestis A-1435 were incubated at 37°C for 45 min in a ratio of 1:1. Subsequent plating studies demonstrated that incubation of the bacterial cells with the immune neutrophils led to the isolation of auxotrophic Y. pestis mutants. The 224 strain isolated from nature yielded 10 Arg^- mutants, and A-1435 (originally isolated from a gerbil) yielded seven Gua^-, seven Val^-Ileu^-, 34 Gua^-Ade^-, and one each of Trp^-Tyr^-, His^-, Leu^-, and Arg^- mutants. These observations indicate that neutrophils appear to be involved in variability of Y. pestis. References 17: 7 Russian, 10 Western.

UDC 615.285.7.012.6].076.9

Influence of Bacillus Sphaericus on Homoiotherms

18400607 Moscow GIGIYENA I SANITARIYA in Russian No 4, Apr 89 (manuscript received 7 Dec 87) pp 21-22

[Article by V. I. Ignatyev, E. G. Karpov, V. Sh. Meliksetyan, All-Union Scientific Research Institute of Veterinary Entomology and Arachnology, Tyumen]

[Abstract] Entomopathogenic spore-forming B. sphaericus (B. sph.) can be used as the basis for manufacture of ecologically safe insecticides capable of killing mosquito larvae. Such preparations have a longer-term residual action, maintain activity in polluted bodies of water and have increased organic matter content. The results of clinical observation and pathomorphological and bacteriological studies of the organs and tissue of laboratory animals indicate that, regardless of method of administration or number of times administered, vegetative cells, spores and the spore-toxin complex of a culture of B. sph. designated INMIA02626 show no locally irritating, toxic or infectious properties and have no negative influence on the course of pregnancy or postnatal development of progeny. The preparation is thus judged harmless to warm-blooded animals. References 4: 3 Russian, 1 Western.

UDC 579.887.9 Legionella pneum /:/579.222: 615.919.015.44:616-008.912

Nature of Cytolytic Activity of Legionella Pneumophila

18400548A Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 2, Feb 89 (manuscript received 12 Jan 88) pp 14-16

[Article by Yu. F. Belyy, I. S. Tartakovskiy, C. V. Gulnik, G. I. Lavreneva, V. M. Stepanov and S. V. Prozorovskiy, Scientific Research Institute of Epidemiology and Microbiology imeni N. F. Gamaleya; Chemical Faculty, Moscow State University imeni M. V. Lomonosov]

[Abstract] Conventional techniques of protein chemistry were used in determining the nature of the protein lytic factor isolated from Legionella pneumophila and shown to act on CHO cell line and erythrocytes. The lysin was demonstrated to be a metalloproteinase with a molecular mass of approx. 38 kD, inactivated by EDTA and diethyl polycarbonate and acting on such substrates as azacasein, DNP-gly-gly-L-ileu-L-argn. The amino acid composition of the enzyme was determined, and it was shown to cause tissue necrosis in experimental animals with intracutaneous administration. Intratracheal administration of 60-100 μg of the metalloproteinase to guinea pigs was followed quickly by death, with extensive destruction of the pulmonary tissue. References 11: 2 Russian, 9 Western.

UDC 579.6:[628.616+628.322]:547.53

Bacterial Biodegradation of Dimethyl Terephthalate (DMT) in Soil and Waste Waters

18400473A Minsk DOKLADY AKADEMII NAUK BSSR in Russian Vol 33 No 3, Mar 89 pp 261-264

[Article by A. S. Samsonova and Z. M. Slizen, Institute of Microbiology, Belorussian SSR Academy of Sciences]

[Abstract] Screening studies were conducted on dernovo-podzolic soil obtained at a lavsan plant to select a bacterium for efficient degradation of DTM. Conventional bacteriologic techniques led to the identification of a strain of Rhodococcus erythropolis, designated DSS-31, as a microorganism utilizing DMT as a sole source of carbon. Inoculation of dernovo-podzolic soil samples with R. erythropolis DSS-31 significantly enhanced biodegradation of DMT. In control soil samples the DTM level fell to 69 percent of the initial level after 2 days of incubation at 28°C, whereas in the

experimental sample inoculated with R. erythropolis DSS-32 the reduction was to 48.5 percent of the starting DTM concentration. After 4 days the levels of DMT were 2.1-fold lower in the experimental sample than in the control sample, and after 7 days 3.7-fold lower. Gas chromatographic analyses failed to detect DMT after 10 days in the experimental samples, whereas a residual level equivalent to 3.4 percent of the initial concentration was detectable after 14 days in the control sample. Studies with waste waters containing organic pollutants showed that inoculation with R. erythropolis DSS-31 leads to complete disappearance of DMT after 212 h at 29°C. Figures 2; references 9: 2 Russian, 7 Western.

UDC 577.214.622

Synthesis and Expression of Synthetic Gene for IgG-Binding Fragment of Staphylococcus Aureus Protein A

18400602C Moscow BIOORGANICHESKAYA KHIMIYA in Russian Vol 15 No 4, Apr 89 (manuscript received 31 August 88) pp 499-507

[Article by V. A. Yefimov, A. A. Buryakova, N. N. Polushin, I. N. Pashkova, Ye. V. Dmitrakova and O. G. Chakhmakhcheva, Institute of Bioorganic Chemistry imeni M. M. Shemyakin, USSR Academy of Sciences, Moscow]

[Abstract] Conventional methodolgy of genetic engineering was employed in the synthesis of a synthetic gene (sspa) for an IgG-binding fragment of protein A. A system of enzyme and chemical steps was developed for assembly of previously cloned subfragment modules bearing a series of unique restriction sites. The sequence of sspa was based on the known amino acid sequence of protein A, with provisions taken to utilize codons most frequently used in E. coli genes. The sspa was designed to encode the signal peptide and modified E and B domains of protein A. The latter was so selected as to consist of the first 12 amino acids of domain E (required for proper processing of the signal peptide), with the remaining segment represented by domain B. Polylinker plasmid pHS3 was used for cloning of the individual modules of sspa and their assembly. Transformation of E. coli HB101 with recombinant plasmids (pUCL3, pUCL4, pUCL5) bearing sspa under lac promoter control led to the expression of sspa and synthesis and excretion of protein A-like peptides in concentrations ranging from 1 to 10 μg/ml culture fluid. Increasing the number of copies of sspa in the plasmids by 2-, 3-, or 4-fold resulted in a corresponding increase in gene expression. Figures 4; references 16: 3 Russian, 13 Western.

Isolation and Functional Activity of Human Placental Ribosomes and Ribosomal Subparticles

907C0258 Novosibirsk IZVESTIYA SIBIRSKOGO OTDELENIYA AKADEMII NAUK SSSR: SERIYA BIOLOGICHESKIKH NAUK in Russian No 2, Aug 89 (manuscript received 7 May 88) pp 92-98

[Article by G. T. Babkina, S. N. Vladimirov, D. M. Grayfer, G. G. Karpova, N. B. Matasova and I. A. Smolenskaya, Novosibirsk Institute of Bioorganic chemistry, Siberian Department, USSR Academy of Sciences]

[Abstract] Ribosomes were isolated from human placenta, fractionated into 40S and 60S components, and tested for nonenzymatic poly(U)-dependent binding of Phe-tRNA^{Phe} from E. coli, as well as for peptide bond formation between Phe molecules of Phe-tRNA^{Phe} bound simultaneously to the aminoacyl and peptidyl regions of the ribosome (located on the 40S subparticle). The binding data for the 40S subparticle and 80S ribosomes reconstituted from the 40S and 60S components showed a binding efficiency that was 30-35% of that shown by 40S rat liver particles. In addition, while binding by placental 40S particles was codon-dependent, the 80S ribosomes showed a high degree of binding in the absence of poly(U). Synthesis of diphenyalanine by the 80S ribosomes demonstrated that for optimum synthesis a twofold molar excess of the 60S component over the 40S component was required for reconstitution, indicating that the 60S subparticle had activity twofold lower than the 40S subparticle. Figures 5; references 15: 1 Russian, 14 Western.

UDC 615.849.11.015.4:616-006].076.9

Effect of Electromagnetic Radiation at 420, 540 and 600 MHz on Course of Tumor Process and Death of Animals with Transplanted Tumor RShM-5

18402072A Moscow VOPROSY KURORTOLOGII, FIZIOTERAPII I LECHEBNOY FIZICHESKOY KULTURY in Russian No 1, Jan-Feb 89 (Manuscript received 01 Nov 88) pp 11-16

[Article by A. Yu. Smirnov, S. V. Zinovyev, G. N. Kalashnikova, V. M. Bogolyubov, All-Union Science Center of Medical Rehabilitation and Physical Therapy, USSR Ministry of Health, Moscow]

[Abstract] The use of low-intensity electromagnetic radiation to control fundamental biological processes and correct pathological states is promising. In treating malignant neoplasms, radiation of this type may be used as a modifying factor in chemical and radiation therapy, as an agent evoking a nonspecific training or adaptation response of the body to the tumor, and as a method of contactless stimulation of the nuclei of the hypothalamus to increase nonspecific tumor resistance. The possibility of using low-intensity electromagnetic radiation for antitumor treatment at certain frequencies in the decimeter wave band is experimentally demonstrated. Figures 5; References 10: 8 Russian, 2 Western.

UDC 612.014.424.5

Nomogram for Evaluating Maximum Intensity of Electromagnetic Radiation in a Near Antenna Field

18400621 Moscow VOYENNO-MEDITSINSKIY ZHURNAL in Russian No 4, Apr 89 pp 50-51

[Article by Lieutenant Colonel A. A. Galkin, candidate of biological sciences, and Major of Medical Service V. G. Zuyev]

[Text] Scientific and technical progress in radioelectronics and a wide utilization of powerful sources of electromagnetic radiation are closely connected with the problem of protecting service personnel against the unfavorable effect of electromagnetic radiation. Hygienic requirements for working conditions and rules of protection for individuals exposed to electromagnetic fields are formulated in GOST [All-Union State Standard] 12.1.006-84 and in the corresponding order of the USSR minister of defense. To fulfill these requirements, military physicians must be able to evaluate radiation intensity levels. However, there are certain difficulties connected mainly with the lack of dosimetric equipment fully capable of measurement tasks. With all their advantages, the latest measurement devices still have serious shortcomings. First, their antennas are very sensitive to overloads. Second, they cannot determine electromagnetic radiation, whose intensity is higher than 20-100 mW/cm^2. Third, the reliability of these instruments is not high.

A computation method of evaluating electromagnetic radiation levels exists, but only a highly skilled operator can use it. We offer another method, by means of which it is possible to determine radiation intensity simply and rapidly—construction of a nomogram. It does not require special training for operators. The accuracy of such an evaluation depends on the selected scale of nomogram axes and on the degree of approximation of the computation formula. Therefore, a relative gain in accuracy can be obtained at the expense of a loss in the range of overlap of parameters—the radiation frequency of the source, antenna area, and energy flux density.

An analysis of scientific reports on the practical accuracy of evaluation of electromagnetic radiation levels for hygienic purposes indicates that 2 dB in power is an entirely acceptable magnitude of error. It is well known that in the United States and other developed capitalist countries the error of energy flux density measurement devices, when arbitrarily polarized radiation is determined, is permitted up to 4 dB over the entire range of measured frequencies. The measurement error in special domestic equipment is about the same. With due regard for the requirements for evaluating energy flux density with an accuracy of 4 dB we selected an optimum scale for the construction of a nomogram for calculating maximum energy flux density in a near, round antenna field and for simultaneously determining with the same nomogram, the distance along the axis from the antenna at which this maximum is expected.

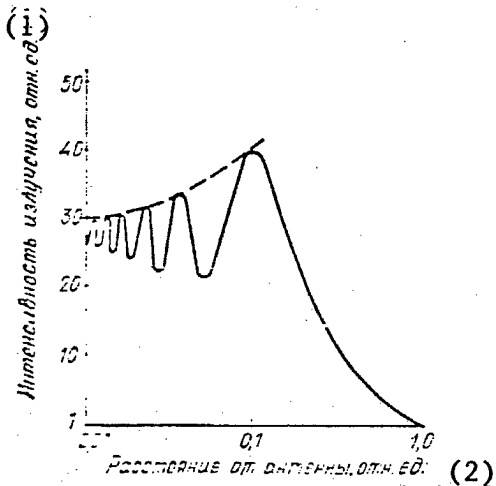

Figure 1. Distribution of Radiation Intensity in a Near Antenna Field

Key: 1. Radiation intensity, relative units 2. Distance from antenna, relative units

Figure 1 presents a typical distribution of radiation intensity in the near zone of the round reflector of an

antenna that has characteristics close to existing semi-spherical antennas (Bickmore, R. W. and Hansen, R. H., 1959; Bogucki, J., 1986). Intensity values, as a function of distance from the antenna surface, are laid out along the axes in relative units. As can be seen from the figure, maximum intensity in the near zone is at the distance $x=0.2D^2/\lambda$, where D is the antenna diameter (in meters) and λ is the wave length of electromagnetic radiation (in meters). This intensity is approximately 40 times higher than the intensity on the boundary of the near and distant zone. It is convenient to represent the distance of the maximum point of energy flux density from the antenna as:

$$R_{max} = 0.67 \cdot f \cdot D^2,$$

where f is radiation frequency (GHz) and R_{max} is the remove (distance) of the point of maximum energy flux density from the antenna (in meters). The value of the energy flux density level is calculated according to the well-known formula (Minin, B. A., 1974):

$$EFD = 16 \cdot P_{av}/\pi \cdot D^2,$$

where EFD is energy flux density (W/m^2) and P_{cp} is the average source power (W).

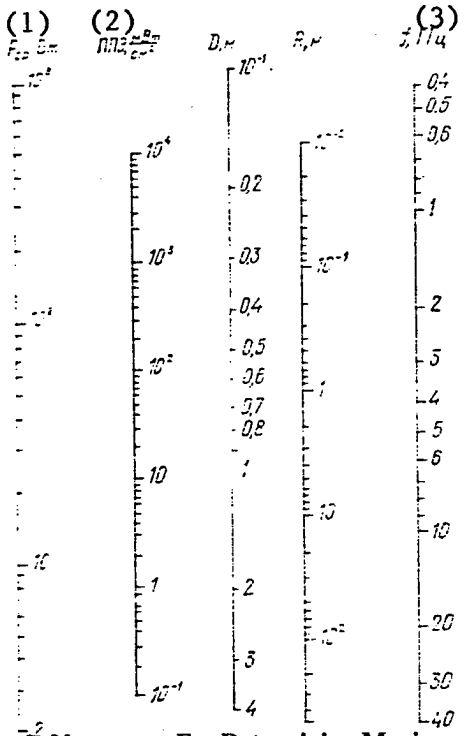

Figure 2. Nomogram For Determining Maximum Radiation Intensity in a Near Antenna Field

Key: 1. Average source power, W 2. Energy flux density, mW/cm^2 3. GHz

An example of computation: An on-board aircraft source has an antenna with a diameter of 0.2 m and an average power of 2 W. Radiation frequency is 10 GHz. From point 0.2 m along the axis of nomogram diameters we conduct two rays for corresponding values of the average source power and radiation frequency. The intersection with energy flux density and R axes determines the sought-for values: 25 mW/cm^2 and 0.3 m.

In medical supervision of working conditions at radar stations the nomogram method has long been used to determine the energy flux density of UHF radiation in the remote zone of electromagnetic field distribution (Koshelev, N. F., 1974). In our opinion, the use of the proposed nomogram for determining the intensity of near fields will expand the possibilities of evaluating the energy flux density of UHF radiation sources.

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UDC 615.384.015.38.067.9

Experimental Studies of Effects of Long-Term Administration of Modified Hemoglobin on Peripheral Blood, Liver and Spleen

18400606C Moscow BYULLETEN EKSPERIMENTALNOY BIOLOGII I MEDITSINY in Russian Vol 107 No 4, Apr 89 (manuscript received 28 Mar 88) pp 488-490

[Article by Ye. A. Selivanov, V. N. Shabalin, I. M. Bystrova, I. Ye. Molokovskaya, V. I. Rugal, G. V. Samsonov, N. P. Kuznetsova, L. R. Gudkin, R. N. Mishchayeva and L. M. Stragovich, Leningrad Scientific Research Institute of Hematology and Blood Transfusion; Institute of High Molecular Weight Compounds, USSR Academy of Sciences, Leningrad]

[Abstract] Polyhemoglobin (I), a 250,000 D Hb preparation prepared by crosslinking Hb with glutaraldehyde, and pyridoxylated Hb (II) were tested for safety in long-term administration to experimental animals. Intravenous administration of II (10 g/L) in a dose of 30 ml/kg/day to 250-300 g outbred rats, 2.5-3.0 kg chinchilla rabbits, and 12-17 kg dogs six times at one-day intervals was without hematologic, hepatic, or splenic sequelae. However, intravenous administration of I (100 g/L) in a dose of 25 ml/kg/day to dogs for 4 days or for 6 days to rabbits and rats had immediate hematologic sequelae in the form of elevated erythrocyte sedimentation rates, relative lymphopenia, reticulocytosis, leukocytosis, and hypoproteinemia in conjunction with elevation of the A/G ration. Dystrophic changes were also evident in the liver, spleen, heart, kidneys, and lymph nodes. Although the hematologic and organ changes were reversible within 30 days, they indicate the need for further studies on the toxicity of I. References 15: 6 Russian, 9 Western.

UDC 615.214.3.017:615.217.34].076.9

Peripheral Cholinolytic Effects of Sydnophen

18400606B Moscow BYULLETEN EKSPERIMENTALNOY BIOLOGII I MEDITSINY in Russian Vol 107 No 4, Apr 89 (manuscript received 17 Jun 88) pp 449-451

[Article by G. Ye. Samonina and Ye. V. Mandriko, Chair of Human and Animal Physiology, Moscow State University imeni M. V. Lomonosov]

[Abstract] Based on clinical indications that sydnophen, a Soviet psychostimulant with moderate antideppressive properties, may affect the peripheral nervous system, studies were conducted on cats to assess its putative cholinolytic properties. The study demonstrated that intravenous administration of 0.002-20 mg/kg sydnophen to anesthetized cats overcame bradycardia induced by electrical stimulation of the vagus nerve. The effects of sydnophen were dose-related, with the initial effects evident with 0.002 mg/kg sydnophen and a 50% reduction in the effects of vagal stimulation otained with 2 mg/kg. These findings demonstrated that in addition to the central effects of sydnophen, the agent also affects the peripheral nervous system. Figures 3; references 11 (Russian).

UDC 615.31:547.96].015.2:[615.31:547.583.5] .015.4:612.82.015.076.9

Mechanism of Action of Delta Sleep Peptide With Administration of L-Dopa

18400606A Moscow BYULLETEN EKSPERIMENTALNOY BIOLOGII I MEDITSINY in Russian Vol 107 No 4, Apr 89 (manuscript received 19 Feb 88) pp 440-442

[Article by Ye. L. Dovedova, Laboratory of Cytochemistry, Brain Institute, All-Union Scientific Center of Mental Health, USSR Academy of Medical Sciences, Moscow]

[Abstract] To further define the potential role of delta sleep peptide in psychopathologic states, experimental studies were conducted on chinchilla rabbits to assess the effects of exogenous delta sleep peptide on levodopa-induced changes on MAO activities at the subcellular level. The rabbits were primed with 50 mg/kg levodopa intraperitoneally, followed in 60 min by 50 μg/kg delta sleep peptide suboccipitally. Within 30 min, measurements were made MAO and AChE activities in the light and heavy synaptosomes and free mitochondria in the sensorimotor cortex and the caudate nucleus. The results showed that the procedure that was employed results in a 150-300% increase in type A MAO activity in both brain tissues, while the activities of type B MAO diminished by 60-80%. AChE activities were not affected to any appreciable extent. These findings indicate that delta sleep peptide functions to activate the serotonergic system, with the net effect of attenuating psychomotor excitation. Figures 1; references 15 (Russian).

UDC658.31/36-006

Antineoplastic Activity of Plants in Lithuanian SSR. Part 8. Chaenomeles Japonica, Inula Helenium, Capsella Bursa Pastoris, Menyanthes Trifoliata

907c0077B Vilnius TRUDY AKADEMII NAUK LITOVSKOY SSR: SERIYA V—BIOLOGICHESKIYE NAUKI in Russian No 2, Apr-Jun 89 (manuscript received 9 Jan 87) pp 118-124

[Article by Yu. M. Valavichyus, K. K. Yankyavichyus, I. V. Mazelaytis, S. F. Budrene, Ya. V. Valavichene, Yu. B. Virbitskas and V. N. Lubyanskene, Institutes of Biochemistry and of Botany, Lithuanian SSR Academy of Sciences]

[Abstract] Water extracts of plants found in Lithuania wre tested for antineoplastic potential in outbred, albino, female rats (110-130 g) bearing transplanted tumors

(sarcoma 45, sarcoma M-1, Pliss lymphosarcoma, Walker's carcinosarcoma). The extracts were administered intraperitoneally for 5 days in doses ranging from 5 to 160 mg/kg, depending on the extract. Assessment of inhibition of tumor growth demonstrated that extracts of Chaenomeles japonica, Inula helenium, Capsella bursa pastoris, and Menyanthes trifoliata possess antineoplastic activity and stimulate body weight gain under certain experimental conditions. Extracts of Menyanthes trifoliate showed, in general, the greatest degree of antineoplastic activity: 50% inhibition of sarcoma M-1 was attained with a dose of 40 mg/kg and of sarcoma 45 with a dose of 150 mg/kg. However, in some cases adverse effects were also noted, as evidenced by a 41% increase in the growth rate of Walker's carcinosarcoma in animals treated with 50 mg/kg of Inula helenium extract. On balance, the promising antineoplastic effects observed with the extract under investigation were attributed to activation of resistance mechanisms. References 2 (Russian).

Arenarinovaya Ointment

18402174B Kishinev ZDRAVOOKHRANENIYE in Russian No 1 Jan-Feb 89 p 46

[unattributed drug description]

[Text] Arenarinovaya ointment is a drug of plant origin. It exhibits pronounced antibacterial activity and stimulates regenerative processes in eye tissues.

It is used for thermal and chemical eye burns and in corneal erosions and lesions of variable origin.

How supplied: in orange-glass jars.

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Quinothilin

18402174A Kishinev ZDRAVOOKHRANENIYE in Russian No 1 Jan-Feb 89 p 17

[unattributed drug description]

[Text] Quinothilin exhibits strong anticholinesterase activity. It is more active than proserine [neostigmine]. It is an antagonist to antidepolarizing curariform drugs. It restores neuromuscular conductivity.

Used to remove residual antidepolarizing block of neuromuscular transmission.

How supplied: 2 ml ampules of a 0.05% and 0.2% solution.

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UDC 615.384:547.221].014.42.07

Cardiotropic and Physicochemical Assessment of Soviet Poloxamers (Proxanols)

18400598A Moscow KHIMIKO-FARMATSEVTICHESKIY ZHURNAL in Russian Vol 23 No 4, Apr 89 (manuscript received 10 Mar 88) pp 409-412

[Article by S. I. Vorobyev, Ye. I. Mayevskiy, V. V. Obraztsov, B. I. Islamov, Yu. V. Ladilov, O. V. Baum, L. A. Popov, A. A. Safroshkina and S. V. Yeletskaya, Institute of Biological Physics, USSR Academy of Sciences, Pushchino]

[Abstract] Toxicity studies and assessment of cardiotropic effects of two Soviet poloxamers (Pluronics 168 and 268) and one Western poloxamer (Pluronic F-68; Serva, FRG) were performed to further define their safety and activity spectra. Toxicity studies on outbred 20-24 g mice, using intraperitoneal administration, showed that the respective LD_{50} values for F-68, 168, and 268 were 9.4, 15.0, and 24.0 g/kg. Following purification on activated charcoal the corresponding values became, respectively, 12.7, 22.0, and 20.0 g/kg. Perfusion studies with isolated rabbit hearts and papillary muscles demonstrated that 3% solutions of these agents exerted inotropic effects. Structure-activity data indicated that a greater cardiac sparing benefit was to be derived from the more hydrophilic block copolymers with a smaller number of polypropylene monomeric units. References 6: 3 Russian, 3 Western.

Immunomodulator Timoptin Approved for Use

18402040b Moscow MEDITSINSKAYA GAZETA in Russian 19 Apr 89 p 3

[Abstract] Immunomodulator Timoptin and its injectable form used as immunostimulators were approved for general medical use by the USSR Ministry of Public Health Order No. 688. Lyophilized Timoptin is a white or slightly yellowish powder with no discernable odor. It induces proliferation and differentiation of T-lymphocyte precursors into mature immunocompetent cells; it normalizes interactions between the T- and B-lymphocytes, activates phagocytic function of neutrophils and stimulates megakaryotic buds. By its composition and activity it resembles Tactivin. Although Timoptin is used in complex oncologic therapies, its primary use is that of an immunostimulator in thymus aplasia, in drug related immunodefficiency, in acute bacterial or viral infections etc. to increase the efficacy of the antibacterial therapy and to correct low levels or dysfunction of T-lymphocytes.

Substances Approved for General Use

18402043 Moscow MEDITSINSKAYA GAZETA in Russian 5 Apr 89 p 3

[Article by Komarov]

[Abstract] The following substances were released for general medical applications by the USSR Ministry of Public Health Order No. 701: antimicrobial and antifungal reagent Decamethoxin in 0.1 g tablets; antitumor reagent Platinum, a lyophilized injectable in 0.015 and 0.03 g doses; wound treatment aerosol "Amprovisol"; antiinflammatory 5ointment Parmidine and an insect repellant emulsion "Oxaphtal".

Leakadin Approved for Use

18402040a Moscow MEDITSINSKAYA GAZETA in Russian 19 Apr 89 p 3

[Abstract] Leakadin, an immunostimulating and antiinflammatory reagent, was released for medical use by the USSR Ministry of Public Health under Order No. 850. Leakadin, a finely crystalline white powder, exhibits antitumor and immunocorrective activity. It passes easily through histohematic barriers, including the blood- brain barrier. Leakadin therapy leads to normalization of the T- helper/T-suppressor cells by lowering the level of the T- suppressors; it increases the cytotoxicity of natural killer cells and the monocytes and retards the growth of tumors.

Drugs, Medication Forms Approved

18402043A Moscow MEDITSINSKAYA GAZETA in Russian 5 Apr 89 p 3

[Article with no byline, under the rubric "News Briefs": "Approved for Use"]

[Abstract] The following drugs were released for general medical applications by the USSR Ministry of Public Health Order No. 701: Decamethoxin, an antimicrobial and antifungal agent in 0.1 g tablets; and Platin, an antineoplastic agent in the form of a lyophilized injectable in 0.015 g and 0.03 g. The following medicinal forms were also approved: aerosol Amprovisol, a wound-healing agent; and a 5% parmidine ointment used as an antiinflammatory agent. A mosquito repellent, Oxaphthal, was also approved.

UDC 615.277.3.05.4

System-Procedural Principles for Primary Selection and Experimental Studies of Antitumor Reagents

18402081c Moscow IZVESTIYA AKADEMII NAUK SSSR: SERIYA BIOLOGICHESKAYA in Russian No 2, Mar-Apr 89 (manuscript received 9 Apr 87) pp 212-218

[Article by S. V. Geodakyan, S. V. Nizhniy and B. V. Ionov, 1st Moscow Medical Institute imeni I. M. Sechenov]

[Abstract] After presenting some organizational principles for the identification and evaluation of antitumor reagents, a review of literature was presented on system-procedural aspects of the structural and functional organization of a system for the selection of promising antitumor reagents and their experimental evaluation. It was shown that the most reasonable approach involves a modular-unit structure with information exchange through on a common data bank. Two approaches were analyzed: one based on formalization and comprehensive use of available data, and the other on a transition from single-parameter experiment strategy to a multiparameter strategy. One such method was presented based on a two-step procedure: the first involved a standardized scheme of experimentation; the second, a customized approach based on the results of the first phase. Figures 1, references 26: 13 Russian, 13 Western.

UDC 616-033.2:577.17

Recombinant Tumor Necrosis Factor (TNF) Modifies Metastatic Potential of Tumor Cells

907C0255B Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 309 No 6, Dec 89 (manuscript received 28 Feb 89) pp 1486-1491

[Article by Yu. I. Kudryavtsev, Institute of Oncological Problems imeni R. Ye. Kavetskiy, Ukrainian SSR Academy of Sciences, Kiev]

[Abstract] Recombinant TNF was assessed for its ability to modify the metastatic potential of LL cell line (derived from Lewis carcinoma) and its high- and low-metastisizing clones E6 and D2, respectively. Testing involved evaluation of pulmonary metastases following injection of C57BL/6 mice with *in vitro* TNF-treated and untreated cells, as well as combinations in which the mice were injected with TNF and treated and untreated cells. In the final analysis, the data demonstrated that short-term exposure of the various cells to TNF enhanced metastases, especially of the D2 cells, in both the *in vivo* and *in vitro* studies. TNF was effective following intravenous and intramuscular administration. Since in the *in vitro* studies enhancement was obtained only with a 10 min incubation and not with longer incubations, it appears that critical, time-dependent, synthetic mechanisms are involved. Nevertheless, the mechanism underlying this action remains enigmatic and the use of TNF in oncologic practice will have to proceed with care. Figures 3; references 15 (Western).

UDC 616.74-009.17+[616.98:579.852.13]-092:612.816]-07

Comparative Analysis of Neuromuscular Transmission Disorders in Botulism and Eaton-Lambert Syndrome

18402111B Moscow ZHURNAL NEVROPATOLOGII I PSIKHIATRII IMENI S. S. KORSAKOVA in Russian Vol 89 No 3, 89 (manuscript received 22 Sep 88) pp 102-107

[Article by A. G. Sanadze, Ye. V. Polikarpova, Department of Human Neuromuscular Pathology with All-Union Myasthenic Center, Scientific Research Institute of General Pathology and Pathologic Physiology, USSR Academy of Medical Sciences; City Clinical Hospital imeni S. P. Botkin, Moscow]

[Abstract] The pathogenic mechanisms of action of the botulism toxin on the nervous system are not fully understood. This article presents a comparative study of neuromuscular transmission in patients with botulism and Eaton-Lambert syndrome. A total of 56 individuals—25 with botulism in its 5-13th day, and 31 with Eaton-Lambert syndrome—were examined with electromyographs. The data indicated higher resistance to ischemia of the neuromuscular apparatus of patients with disorders in mediator release than in healthy controls. Neuromuscular transmission was evaluated on the basis of the negative phase of M response of the abductor muscle of the fifth finger when it is subjected to indirect supramaximal stimulation. Stimulation at 6 pulses/sec in botulism patients resulted in an increase in the amplitude of the M response with practically the same magnitude as tetanization. In patients with Eaton-Lambert syndrome, this same stimulation caused a decrease in M-response amplitude, while tetanization caused an increase to the normal level. The responses indicate disruption in both release and synthesis of the mediator. The differences observed are apparently results of damage to different mechanisms of conduction in the neuromuscular synapses. Figures 3; References 16: 3 Russian, 13 Western.

UDC 612.822.3

Electrophysiological Characteristics of Functional Interhemispheric Asymmetry

18402006A Moscow ZHURNAL VYSSHEY NERVNOY DEYATELNOSTI IMENI I. P. PAVLOV in Russian Vol 39 No 1, Jan-Feb 89 (manuscript received 9 Nov 87) pp 44-51

[Article by V. V. Arshavskiy and V. S. Rotenberg, Medical Institute, Riga; 1st Moscow Medical Institute imeni I. M. Sechenov]

[Abstract] Electrophysiological studies wre conducted on the synchronization of EEG potentials in 2,049 male and female subjects, 6-55 years old, in order to assess the effects of stimuli known to target either the right or left cerebral hemisphere. Evaluations were conducted in terms of alpha-rhythm parameters, relying on the amplitude of the potentials and the alpha index. Presentations of different tasks, known to be performed by either the right or left hemisphere—i.e., involving different types of information processing—led to the identification of three types of interhemispheric relationships. Tasks with defined right or left laterality evoked the anticipated type of hemispheric activation. However, activation of EEG activities in both hemispheres, in terms of the alpha index, prevailed in situations when the subject was faced with a task that did not correspond to either right or left dominance. This form of activation was interpreted as an attempt at functional compensation of the right hemisphere in individuals with left cerebral dominance, and vice versa. These observations demonstrated that cross-correlation analysis of EEG activation patterns may provide a quantitative indication of the functional preparedness of the brain for problem solving, based on preference for either right or left processing style. Figures 1; references 25: 16 Russian, 9 Western.

UDC 577.1.57.086.3:595.44.7

Effects of Latrodectus Pallidus Venom and Antivenin on Synaptic Ultrastructure of Rat Spinal Cord

18400473C Minsk DOKLADY AKADEMII NAUK BSSR in Russian Vol 33 No 3, Mar 89 pp 280-282

[Article by V. S. Safarova, A. A. Akhunov and L. I. Archakova, Institute of Physiology, Belorussian SSR Academy of Sciences; Institute of Bioorganic Chemistry, Uzbek SSR Academy of Sciences]

[Abstract] Ultrastructural studies were conducted on the gray matter of the anterior horns of the lumbar spinal cord of rats to assess the effects of parenteral venom derived from the spider Latrodectus pallidus on the synaptic apparatus. The fixed cords were obtained from male Wistar rats treated with 2-3 LD50 doses of the venom. The effects of the venom were determined to consist of marked depletion of synaptic vesicles, filling of the synaptic clefts with electron-dense matter, and extensive distortion of synaptic structural features. The mitochondria were swollen, vacuolated, and disorganized. A selected group of rats was treated with 5 LD50 of the venom, followed by the administration of 0.2 ml antivenin in one to 30 min. Treatment with antivenin was effective in preventing synaptic damage, demonstrating that early antiserum therapy offers adequate neural protection. Figures 1; references 15: 1 Russian, 14 Western.

UDC 547.967.4:612.81

Effect of Vasopressin Analog on the Induced Activity of Various Brain Structures

18400613B Riga IZVESTIYA AKADEMII NAUK LATVIYSKOY SSR in Russian No 6, Jun 89 (manuscript received 12 Feb 87) pp 94-96

[Article by I. V. Kudryashova, O. S. Papsuyevich, G. I. Chipens, Institute of Higher Nervous Activity and Neurophysiology, USSR Academy of Sciences; Order of the Red Banner of Labor Institute of Organic Synthesis, LaSSR Academy of Sciences]

[Abstract] Vital to an understanding of the role of neuropeptides is the question of the functional purpose of the signal value they hold for nerve cells. The question must be viewed, however, in terms of the entire body, i.e., in terms of the extent of their participation in the transmission of a given type of information on, say, the objective characteristics of a stimulus, or the subjective relationship of the body to a given stimulus. The best way to examine such a question is to study the effect of neuropeptides on induced responses of certain brain structures whose functional role in behavior is described. The researchers here studied the effect of des-9-glycine-[8-arginine] vasopressin (DG-AVP)—a vasopressin analog stripped of hormonal properties, but with mnemic properties—on the induced activity of the brain structures. (Vasopressin regulates long-term memory, and vasopressin fibers have been found throughout the central nervous system.) Using electrophysiological analysis, the researchers recorded the total induced activity of the hippocampus in response to single pulses of stimulation of the medial septal nucleus or the septofibrial nucleus in free-roaming rabbits. They also studied the induced potential in the sensorimotor cortex upon electrical stimulation of the skin of the front extremities and the response of the pyramidal tract to direct stimuation of the cortex. The effects on each of three systems—the limbic, sensory, and motor—are given. Administration of DG-AVP produced consistent reduction in the response in the hippocampus to stimulation of the medial septal nucleus. Response amplitude was not restored the following day. Response threshold was elevated. The DG-AVP had varying effects on induced potential components, but produced no appreciable changes in either the direct component of the pyramidal tract response or in the secondary, "monosynaptic" component. The central effects of DG-AVP are tied to its influence on subcortical structures which affect motivation and emotion processes.

UDC 615.213.015.2:615.31:577.112.6].07

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

18400654D 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; references 7: 4 Russian, 3 Western.

Review of Book on Neurochemistry of Hibernation

907C0310 Kiev UKRAINSKIY BIOKHIMICHESKIY ZHURNAL in Russian Vol 61 No 5, Sep-Oct 89 pp 114-115

[Review by Professor Ya. V. Belik, doctor of biological sciences, of book by N. N. Demin, T. Kh. Shortanova,

and E. Z. Emirbekov, "Neurochemistry of Mammalian Hibernation," Nauka, 1988, 137 pages]

[Text] Deciphering the biochemical bases of mammalian hibernation is important in theoretical as well as practical terms. The neurochemical aspects of the problem, which have been studied now for almost half a century, have never been properly summarized either in our country or abroad. Earlier published analytical surveys have touched upon, as a rule, only isolated aspects of tissue biochemistry in hibernation and articifial hypothermia. This monograph systematizes and interprets theoretically the literature's vast amount of experimental data that characterizes the role of neuromediators and neuromodulators in the neurochemical mechanisms of mammalian hibernation (chapter I); the features of the composition and metabolism of tissue proteins and ribonucleic acids (chapter II), lipids (chapter IV), and low-molecular nitrogen compounds (chapter III); and the specific nature of the bioenergetic processes that occur in brain tissue as hibernation progresses (chapter V). The monograph uses the data of the literature and the findings of the authors' own research to present for the first time ever a clear picture of the biochemical differences between mammalian hibernation and the cold-weather torpor of poikilotherms.

The book's authors, who have made a large contribution to the study of a number of problems involving the neurochemistry of hibernating animals, reach a sound conclusion about the fragmentary nature that existed until now with regard to recorded findings and about the inadequacy of those findings for making general conclusions about the molecular mechanisms that constitute the biochemical basis of the various stages of hibernation (the preparatory period, the lengthy intermittent state of hypobios, and the awakening that follows it). It's important to note that the authors do not simply state that our knowledge of the neurochemical mechanisms of hibernation is incomplete. Based on an in-depth analysis of the existing experimental material, the concluding section of the book identifies the most probable promising directions in research and formulates specific aspects of the problem whose solution can fill-in the existing blank spaces in our notions regarding the biochemical mechanisms of hibernation and the role of the nervous system in that unique state of the mammalian body.

The book validly notes the practical value of a comprehensive study of the processes associated with intracellular metabolism in hypothermia—particularly of its neurochemical aspects for experimental biology and medicine, where controlled artificial hypothermia is already being widely used. The level of learning today within the field of the biochemistry of hibernating mammals enables the authors to suggest the possibility of the future development of recommendations involving the creation of a reversible, rather lengthy human hypobios.

Another outstanding feature of the book is its analysis of many biochemical indices over the course of a mammal's hibernation, as well as its discussion of the combined role of the nervous system and the endocrine system in the regulation of biochemical processes at various stages of the development of this extraordinary physiological state in the mammal's body.

The book is intended for a broad array of specialists who are interested in the problems of the biochemistry of hibernation, artificial hypothermia, and extreme states.

UDC 616-006-082

Urgent Issues in the Creation of Oncologic Data Bank

907C0235A Moscow ZDRAVOOKHRANENIYE ROSSIYSKOY FEDERATSII in Russian No 8, Aug 89 (manuscript received 12 May 88) pp 29-33

[Article by I. V. Drozdova, B. N. Kovalev, A. Ye. Okeanov, V. V. Starinskiy, A. Ye. Okeanov, A. I. Kadushin and Yu. A. Semenov, Moscow Scientific Research Oncological Institute imeni P. A. Gertsen; Russian Republic Data Processing and Computer Center, RSFSR Ministry of Health, Moscow; Scientific Research Institute of Oncology and Medical Radiology, Belorussian SSR Ministry of Health, Minsk]

[Abstract] In order to improve the quality and efficiency of oncologic care in the RSFSR, an oncologic data processing system, "Onkologiya," has been designed to serve as a data bank at the population and individual patient levels. The system underwent successful trials in the Chuvash ASSR in 1982-1985 and has been approved for large-scale testing in other regions of the RSFSR. The cost has been estimated at 15 kopecks a year per patient, making it economically attractive. With additional improvements and refinements that are expected to come as a result of additional testing, the system should meet the full requirements for a current oncologic data bank for the RSFSR. References 3 (Russian).

UDC 614.881

Improvements in Emergency Medical Service During Restructuring of Health Care Sector

907C0138a Moscow SOVETSKOYE ZDRAVOOKHRANENIYE in Russian No 5 May 89 (manuscript received 6 Apr 88) pp 9-11

[Article by B. G. Apanasenko, A. N. Nagnibeda and A. D. Shiryayev, Leningrad Scientific Research Institute of Emergency Medical Service imeni Professor I. I. Dzhanelidze]

[Abstract] In an attempt to improve emergency medical care rendered at the prehospital stage, intensive care teams (ICTs) have been organized for several years now in Leningrad. The teams provide highly skilled emergency care covering a broad spectrum of problems for the seriously ill and seriously injured. Such teams were needed because, with the overspecialization of the emergency medical service, personnel were making calls outside their specialties, and the quality of the care that individuals received suffered. Analysis of emergency calls showed that during 1984, 1985 and 1986, the figures for the average number of calls for general emergency assistance (by line teams or ICTs) were 14.6, 14.7 and 15.6; whereas for 10 different specialty teams, the figures were 5.6, 5.4 and 5.4, respectively. In 1986, the most frequent calls were for the CPR-surgical teams (6.7) and the lowest for drug abuse teams (2.8). At this time there are 65 active ICTs in Leningrad. In 1986, they revived more than half of the individuals they found in a terminal state or suffering from traumatic or cardiogenic shock. Introduction of ICTs in Leningrad has made it possible to remove 22 specialized teams from service, leading to savings of about one million rubles per year. The number of grave errors committed in the emergency care has dropped. The replacement of specialized teams by ICTss can be done,however, only with proper training of the physicians involved in such work. References: 9 (Russian).

UDC 614.254/.256:[658.387.4+331.103.5

Team Approach to Organization and Financing of Medical Staffs at City Hospitals

907C0235B Moscow ZDRAVOOKHRANENIYE ROSSIYSKOY FEDERATSII in Russian No 8, Aug 89 (manuscript received 4 May 88) pp 34-36

[Article by L. Ya. Litvinenko, G. I. Balandin, V. I. Trunov and V. A. Belousov, Altay Kray Health Department; Central City Hospital, Novoaltaysk]

[Abstract] A team approach has been implemented at the Novoaltaysk Central Hospital to the organization of the medical staff and in determining salaries. The intention was to improve the quality of patient care, provide cost-effective health care, instill a greater sense of responsibility in the medical staff, and eliminate salary inequities. The latter stemmed from the fact that all staffers were paid the same for their particular job regardless of performance. Team leaders in each professional category were chosen on the basis of professionalism and performance, and an evaluation system was developed to monitor individual and team performance. As a result, staff morale improved and salaries have gone up. For example, in the case of physicians, the average monthly salary has increased to 280 rubles from 183, an improvement of 53%.

Infant Mortality in Turkmen SSR

907C0247D Moscow MEDITSINSKAYA GAZETA in Russian No 99, 18 Aug 89 p 2

[Interview with Professor V. Ye. Radzinskiy, doctor of medical sciences and director of the Scientific Research Institute for the Protection of the Health of Mother and Child, under the rubric "Timely Interview": "The Empty Cradle: Why Does Infant Mortality Remain High in Turkmenistan?"]

[Abstract] Infant mortality in the Turkmen SSR continues to remain extremely high, currently standing at 54 neonatal deaths per 1000 live births. In addition, 60% of the children in the first year of life suffer from protein deficiency, while the longevity of women in the Turkmen SSR is the lowest in the USSR. This situation reflects years of health neglect, unrestrained introduction of chemicals into agriculture, poorly trained and motivated health workers, and lack of adequate health education.

In some oblasts 75 to 80% of the water is unfit for drinking. In addition, family planning is virtually unheard of or is ineffective, placing a considerable strain on the physical and mental health of women, as well as on society at large. In areas where concerted steps have been taken to alleviate such conditions, child morbidity and mortality decreased 2.5- to 3-fold. In addition, the Turkmen SSR is the first republic in the USSR to provide free nutrition for children under a year of age at a cost of three million rubles annually. Further progress in managing pediatric health is the creation of a prenatal center with funding and support to be secured from Soviet child health organizations and, perhaps, foreign firms. A comprehensive approach of this kind offers hope for the future in ensuring better health care for its young citizens.

Public Health Conditions in Gorkiy

907C0247C Moscow MEDITSINSKAYA GAZETA in Russian No 99, 18 Aug 89 p 1

[Article by Yuriy Aleksandrovich Marchenkov, first secretary, Gorkiy Gorkom, CPSU; deputy, RSFSR Supreme Soviet]

[Abstract] Public health and health care in general in Gorkiy remains unsatisfactory. This has, quite franky, stemmed from long-term neglect, inattention to environmental issues, and preoccupation with industrial production at any cost. As a result, Gorkiy has one of the highest rates of absenteeism in the USSR for health reasons, exceeding by tenfold the economic losses sustained for other reasons. Recently, a concerted effort has been made to alleviate the shortage of hospital beds (6,000, including 1,000 pediatric beds), medical personnel, and health facilities. Special emphasis has been placed on establishing, improving, and expanding industrial health services and facilities, enforcing pollution controls, and in establishing the first medical emergency hospital in the city.

Public Health in Nakhichevan ASSR

907C0247A Moscow MEDITSINSKAYA GAZETA in Russian No 101, 23 Aug 89 p 1

[Article by F. Dzhafarkuliyev, minister, Nakhichevan ASSR Ministry of Health], from Nakhichevan, Azerbaijan SSR, under the rubric "Managing Zealously": "We Walk in Gold, But Complain About Poverty"]

[Abstract] The health budget of Nakhichevan ASSR amounts to 13 kopecks per resident. This figure is self-explanatory taking into consideration that a routine x-ray costs 4 kopecks, and it explains the sorry state of health care in the republic. To alleviate this situation the Ministry of Health has encouraged the development of cooperative organizations that would improve medical facilities, education, and financing. To date, three cooperatives have been established to upgrade and build health facilities, exploit the botanical resources for drug production, and provide uniforms, linens, and other articles of clothing for the health profession. Nakhichevan has been accused of going too "commercial" in its health care and neglecting quality. To some extent such criticism is justified. But the question to be asked is whether quality of care can be attained without the rudimentary material and financial resources?

UDC 101+61

Data Processing for Medical and Health Care Services

18402182 Kishinev ZDRAVOOKHRANENIYE in Russian No 3, May-Jun pp 3-7

[Article by P. V. Berlinskiy and F. N. Tsyrdya, Department of Philosophy, Kishinev Medical Institute]

[Excerpts] [Passage omitted] What is the situation in Moldavia with respect to the computerization and automation of data processing in medicine and health care, and what are their prospects?

One cannot say that nothing is being done in this area in the republic. However, in our view, whenever something new is introduced, it is, as a rule, done by isolated, enthusiastic chief physicians, and the equipment that is installed is not utilized effectively.

Computers are being used in the emergency hospital (chief physician, G. L. Kravchik). Automated control systems have been installed for the hospital, the polyclinic, the dispatch station, and the pharmacy. Practically all information about patients and about the work of medical personnel, administrative and managerial personnel, and the pharmacy is fed into the computer. The data preparation center has over 150 indices of general information on the emergency-care station, the substations, each polyclinic, the treatment district, and the physician. More than 1,500 electrocardiograms are transmitted annually by telephone through the remote consultation diagnostic center. These and other operations have made it possible to release physicians from carrying out secondary, non-productive tasks and have allowed them to devote more time to their primary activity—caring for patients. A physician should not have to fill out written case histories, outpatient charts, and other forms (although they have not yet been abolished in the emergency hospital). Paperless medical information science can give us information at any time, and more efficiently than can be done by the corresponding specialists.

Computers are being successfully utilized in the training pharmacy of the pharmaceutical department of the Kishinev Medical Institute (dean, V. I. Prokopishin). The computer is fed information on the mechanism of action, indications, and contraindications of drugs and their availability in the warehouses and pharmacies. This allows the physician to treat the patient more efficiently so that he doesn't prescribe drugs that are not

available at the pharmacies. This system also makes it possible to automate the pharmacy's information service.

Productive work is being carried out on the installation of computers in the Republic Clinical Hospital No. 1 (chief physician, T. V. Moshnyaga), and work is beginning on the introduction of computer equipment and technology into the Scientific-Research Institute for Preventive and Clinical Medicine (director, M. I. Popovich). [passage omitted]

One should take note also of the considerable difficulties and problems associated with the computerization and automation of health care. In our view, there are several such difficulties. First of all, there is the equipment supply problem. The health care institutions and medical teaching institutions of the republic are experiencing a shortage of funds for acquiring and installing computers. The territorial and subsponsor organizations could render considerable assistance here. There is also an insufficient number of computers and peripherals, such as monitors, printers, cables, etc. For example, a minimum of 250 monitors is required in order for the computer system at the Republic Clinical Hospital No. 1 to be fully operational. The aforementioned training pharmacy could serve ten times more physicians at the polyclinics and hospitals if the system were hooked into all the stations. Consequently, we must solve the problem associated with the production (manufacture) of computers and a sufficient quantity of peripherals in a way that takes the needs, purposes, and essence of medicine into consideration.

Another problem is a psychological one. Physicians and middle-level medical personnel are essentially unprepared to use computers. They have not been trained in this area. Physicians-to-be spend 12 hours becoming acquainted with a few factors of the operation of the computer. Such a program differs little from what is offered in a high school computer science course. Moreover, this training is offered in the first year, and not in the medical institutions. [passage omitted]

It seems that the time has come to introduce a new course into the teaching process—something like "Paperless Medical Information Science," covering 100-120 hours in the senior courses, with obligatory practical work. We also think that it would be advisable for the MSSR Ministry of Health, together with the Ministry of Public Education, to undertake in the immediate future the training of specialists in medical information technology. The shortage of such personnel will prolong the backwardness of our health care sector substantially. [passage omitted]

Experiment in Economic Management of Hospitals Evaluated

18402164b Moscow MEDITSINSKAYA GAZETA in Russian 12 Jul 89 p 2

[Article by V. Koryukin, chief physician, No 19 Territorial Medical Association, Leningrad: "There's No Rational Alternative"]

[Abstract] Much has been written about the new economics of Soviet medicine, with considerable discussion of the pros and cons of cost effectiveness and economic accountability. The experience of the No. 19 Territorial Medical Association in Leningrad demonstrates in no uncertain terms the benefits of the new approach in enhancing the quality and efficiency of medical care, from the viewpoint of the patient, physician, and health administrator. While the program of greater independence and local goal-setting has been a success at this association, this is by no means a universal experience. Nevertheless, the medical staff, patients, and health care administrators pooled their talents and resources to ensure cooperation and cut costs, avoid elective hospitalization in preference to ambulatory care, and carefully analyze all of the components of health care as to cost benefit and efficiency. As a result, statistics have now becamoe available which point to a reduction in overall mortality, morbidity, sick days at work, and days of hospitalization. In addition, the salaries of physicians have increased by 15-20%, and 81.7% of the physician slots are filled (versus an average figure of 72.2%). Excess funds are now being expended on a variety of social programs, with 25% of the income—approximately half a million rubles—allocated to the association's building programs.

Saratov Association Combines Research and Clinical Medicine

18402099 Moscow MEDITSINSKAYA GAZETA in Russian 23 Jun 89 p 1

[Article by V. Shustov, professor and director, Scientific and Practical Association of Occupational Pathology and Hematology, Saratov Medical Institute, Saratov: "The Times Dictate the Choice"]

[Abstract] The Scientific and Practical Association of Occupational Pathology and Hematology at the Saratov Medical Institute is the first association of a type that is expected to become a network across the USSR, i.e., associations combining basic research, medical technology, and clinical medicine. The selection of hematology in the Saratov experiment was based on the fact that this is an area heavy in chemical industry, with a high incidence of occupational hematologic disorders. The association cuts across departmental lines and encompasses research and its practical applications in the clinical setting under one administration. This approach has made it possible to attract topnotch scientists and clinicians and strengthen educational programs, particularly in the field of hematology. The association has developed a mass screening program for those at risk of hematologic disorders, it provides medical services to a number of nuclear power plants and treatment to workers that had been engaged in damage control at Chernobyl, and it is actively compiling a hematologic database. Greater efficiency in the allocation of resources and the improved purchasing power has increased the supply of chemotherapeutic agents in the area. The success of this program, bringing as it does into

close association academic and industrial sectors in a defined-purpose program, should provide a stimulus for the expansion of this concept to other aspects of health care in the spirit of perestroyka.

UDC 616-084.3:008

Assessment of Effectiveness of KASMON System Based on Data Compiled at Municipal Polyclinic

18402055A Moscow SOVETSKAYA MEDITSINA in Russian No 2, 89 (manuscript received 11 Mar 88) pp 37-39

[Article by G. S. Popov, S. L. Solomonov, L. F. Yablonskaya and G. Z. Nurmatova, Chair of Social Hygiene and Health Administration, Riga Medical Institute]

[Abstract] A comparative analysis was conducted on the effectiveness of the KASMON system and a team of three physicians in a health screening trial conducted at the No 7 Polyclinic in Riga. In each case a group of 200 men, aged 30-49 years, was screened. In the cohort screened by the physician team a total of 171 chronic diseases were uncovered, indicating a chronic morbidity of 850/1000. In the KASMON group of subjects 347 chronic conditions were diagnosed, for a morbidity of 1725/1000. These findings demonstrated that KASMON-based health screening is twice as likely as an experienced team of physicians to detect chronic pathology. Accordingly, the KASMON system was shown to be a cost-effective means of enhancing the efficiency of mass screening without requiring a significant increase in the number of patient visits to the polyclinic. References 2 (Russian).

UDC 616-084.3.003.1(574-22)

Evaluation of Cost-Effectiveness of Measures for Rural Mass Health Screening

18402008B Moscow SOVETSKOYE ZDRAVOOKHRANENIYE in Russian No 1, 89 (manuscript received 31 Dec 87) pp 39-42

[Article by T. K. Kalzhekov, candidate of medical sciences, P. P. Petrov and D. Z Borokhov, doctors of medical sciences, and S. Ye. Ibrayev, Scientific Research Institute of Regional Pathology, Kazakh SSR Ministry of Health, Alma-Ata]

[Abstract] The socioeconomic benefits of rural mass health screening were assessed for the Zerendinskiy Rayon, Kokchetav Oblast, Kazakh SSR, beginning with 1984. The medical statistics showed that in the timeframe in question the overall mortality in the rayon decreased by 11.2%, with the most pronounced fall seen in the 30-59 age bracket in the three-year period. The changes in the mortality statistics were attributed to the mass screening program. In conjunction with other health status indicators the net effect consisted of a 3.2% increase in occupationally-active years and an overall increase in productivity of 10%. Evaluation of the results of mass screening in terms of direct economic benefits showed that the annual saving produced by mass screening in the rayon was on the order of 674,149 rubles. This figure is expected to improve on a yearly basis as productivity indicators continue to show further gain and the case load of the chronically ill in the rayon continues to decline because of improved health care.

UDC616-084.3(476.7)

The Transition to Mass Health Screening in Brest Oblast

18402008C Moscow SOVETSKOYE ZDRAVOOKHRANENIYE in Russian No 1, 89 (manuscript received 24 Feb 88) pp 54-58

[Article by P. R. Shidlovskiy, Department of Health, Brest oblast]

[Abstract] Preparation for the introduction of mass screening into the health care in Brest Oblast included decentralization and redistricting to reduce the patient-:physician ratio. As a result of such efforts, the load for a district therapist has been reduced to 1,630 adult per physician, and in the pediatric services to 804 children per pediatrician. Other improvements included the opening of 18 new walk-in clinics in the Brest Oblast within the last four years, as well as expansion of mobile medical services. The medical statistics for the 1975 to 1986 period have shown a marked increase in the percentage of the population encompassed by mass screening, reaching 95.1% in 1986. The program also included extensive health education and opportunities for advanced training for the medical personnel. On an overall basis the program has been a success and has reduced the number of lost workdays to 119.2 days per 100 workers. However, it is generally recognized that there is a shortage of physicians in the oblast and that a serious effort has to be made to introduce new medical technologies into the oblast and expand the existing health facilities in order to fully take advantage of the opportunities offered by mass screening. References 9 (Russian).

Ship-Based Polyclinic in Tyumen Oblast

18402165b Moscow MEDITSINSKAYA GAZETA in Russian 21 Jul 89 p 1

[Article by A. Vladimirtseva, MEDITSINSKAYA GAZETA correspondent, Tyumen Oblast, under the rubric "The Big Problems of Small Ethnic Groups": "A Floating Polyclinic"]

[Abstract] The steamship Zdorovye continues to remain the sole ship-based polyclinic operating in the waterways of the Tyumen Oblast, rendering what services it can to the native Khanty, Nentsy, Mansy, and Selkupy populations that have been largely bypassed by industrialization in the oblast. Although Zdorovye has operated for some 21 years, the ship remains understaffed and lacks many of the features and equipment that make for

optimum medical care, according to its chief physician T. S. Nadeina. To some extent, dedicated volunteer physicians from other areas of the USSR bridge the personnel gap. Nevertheless, no efforts have been made to provide the medical personnel with the type of salary and living conditions that are a matter of course at other medical installations. One ship, even with the best of intentions and the most committed of personnel, can only do so much. There is obvious need for an entire system of ship-based polyclinics to cover the area of the Tyumen Oblast. However, a realistic assessment of the situation indicates that the outlook for any improvement in the status of the native people continues to remain poor.

Function of Minzdrav's Third Main Directorate

907C0315 Moscow GUDOK in Russian 29 Dec 89 p 4

[Article by Ye. Shulzhenko, chief of the USSR Ministry of Health's Third Main Directorate, under the rubric "You Ask, We Answer": "The Third Main Directorate Reveals Secrets"; first paragraph is question asked by O. Kutsenko, from Odessa; second paragraph is source introducton]

[Text] *The USSR Council of Ministers, we know, recently adopted a decree to abolish the Fourth Main Directorate. But, besides it, the Third Main Directorate also functions within the USSR Ministry of Health. I would like to know what functions it is invested with, and how justified is its existence?*

We asked the chief of the Third Main Directorate in the USSR Ministry of Health, Ye. Shulzhenko, to answer those questions.

SHULZHENKO: Our directorate was created in 1947 to provide medical support for the workers of USSR atomic power enterprises and institutions.

Today, in addition to servicing the Ministry of Atomic Power, the Third Main Directorate services enterprises and institutions of the ministries of general machine building, chemical industry, petroleum refining and petrochemical industry, medical and microbiological industry, and shipbuilding industry, as well as certain other ministries and departments in which there exist conditions or little-studied factors that affect human health. Moreover, the directorate is entrusted with the tasks of conducting and coordinating work involving the biomedical support of space missions, the development of the depths of the World Ocean, and man's stay in the Arctic and Antarctic, the desert, the mountains, and other adverse or extreme environmental conditions.

At present, the Third Main Directorate has 153 medical units and 12 scientific-research institutes and experimental design bureaus, the largest of which are the Institute of Biophysics and the Institute for Biomedical Problems.

The medical units work in close contact with regional health care agencies, on the basis of mutual provision of consultation and hospital medical care and the use of bases and centers. A medical unit is a complex of institutions that include hospitals, polyclinics, a sanatorium/treatment-and-prevention facility, health care stations, and a sanitation-epidemiological station. Roughly 90

of the equipment in all of them is domestically produced equipment.

Nearly 100,000 people work in the health care institutions of the Third Main Directorate; some 20,500 of them are physicians, and about 44,000 are mid-level medical personnel.

Beginning in 1989, all scientific organizations work on a cost-accounting basis, and their activity is directed at making as great a contribution as possible to health care practice.

By a decree of the USSR Council of Ministers, the Third Main Directorate is commissioned with the medical support of those working at nuclear electric power plants, health inspections, and the monitoring of the radiation conditions at production sites, working conditions, and the exposure of personnel to radiation, plus the monitoring of radiation levels in the vicinity of nuclear electric power plants.

It should be noted that over the span of the entire period since nuclear electric power plants began operating, not one single instance of occupational disease resulting from exposure to ionizing radiation—with the exception of Chernobyl—has ever been recorded.

Occupational Fitness and Capabilities of Trainees

907C0162 Moscow PSIKHOLOGICHESKIY ZHURNAL in Russian Vol 10 No 3 May-Jun 89 pp 93-98

[Article by G. L. Koroteyev and A. P. Cheryshev, Moscow]

[Abstract] The time required to properly train operators of various control systems differs from individual to individual because their abilities to master certain tasks differ considerably. The authors propose an approach that they feel will solve a number of critical problems associated with occupational training. They point out that the period of instruction needed for a given occupation can be shortened by use of the concept of occupational differentiation, which determines the abilities of groups of candidates for given jobs, forming homogeneous groups of students and providing "quasi-individual" training. One of the principal junctures of instruction is the the juncture at which occupationally important qualities (OIQ) begin to develop. In the course of occupational training, however, the components of OIQ and their interrelationship change continuously in a very complex pattern. Therefore, the authors suggest that the level of development of subsystems of OIQ be evaluated from the standpoint of occupational requirements which they characterize as "individual occupationally oriented dynamic structures" (IOODS), which begin to develop during the training period. The level of the development of IOODS may be easily evaluated by modeling actual activity with simulators that have a high degree of abstraction and a low level of similarity in terms of information dynamics. References 10: 8 Russian, 2 Western.

UDC 577.391.611.8

Repair Rate of Radiation Damage of Central Nervous System After Prolonged and Fractionated Irradiation

907C0160G Moscow RADIOBIOLOGIYA in Russian Vol 29 No 3, May-Jun 89 (manuscript received 28 Jun 88) pp 384-388

[Article by V. N. Malakhovskiy and M. I. Bokk, Military Medical Academy imeni S. M. Kirov, Leningrad]

[Abstract] The researchers here set out to determine the reparation rate of radiation damage to the CNS from the change in an equieffective dose as it relates to the time of irradiation in two different species of animal: guinea pigs and dogs exposed either once or twice to γ-radiation at a dosage of 114 Gy/hr. A general pattern was noted for the recovery of the CNS from acute radiation damage; the pattern could be approximated by an exponential function with a rate constant $\lambda = 0.02/hr^{-1}$ and a half-recovery period of about 30 hrs. This limits the maximum duration (about 3 days) and minimal dose (about 1.5 Gy/hr) of radiation that can cause the cerebral form of acute radiation disease. At a lower level of radiation (0.33 Gy/hr), the cerebral form did not manifest itself, because the animals died after four days from an intestinal form of this disease. References 17: 10 Russian, 7 Western.

Melanin Acts as Radioprotector

907C0318A Minsk SOVETSKAYA BELORUSSIYA in Russian 4 Jan 90 p 2

[Article by A. Patyko: "The Healer Is Called 'Melanin'"]

[Text] The pigment melanin, which is produced by the body for protection against solar radiation, may help people exposed to Chernobyl radionuclides avoid health-endangering irradiation. This was the conclusion reached by scientists of the Institute of Genetics and Cytology of the Belorussian Academy of Sciences who have completed research on the properties of this natural radioprotector.

The scientists established that this completely safe compound may be isolated from the raw material of plants or synthesized and added to food products. With this kind of support, the body's resistance to radionuclides increases. This was confirmed by experiments on laboratory animals. In the opinion of the scientists, medical research institutes should begin extensive clinical testing of the innovation and, based on the results, set up industrial production.

Kazakh Scientists Develop Laser Method for Rehabilitation After Radiation Exposure

907C0318C Alma-Ata KAZAKHSTANSKAYA PRAVDA in Russian 21 Jan 90 p 4

[Article by Professor V. Inyushin, Meritorious Inventor of the Kazakh SSR, under the rubric "Research and Hypotheses": "After the Explosion: Kazakhstan Scientists Have Developed a Procedure for Man's Bioenergetic Rehabilitation"; first two paragraphs are source introduction]

[Text] **Surface and underground nuclear tests in Semipalatinsk Oblast and the accident at the Chernobyl Nuclear Power Plant revealed the existence of enormous uncharted expanses in radiobiology and medical radiology. This has been reflected in the effectiveness of health care in the fight against the effects of radiation injury to the population.**

Attempts are being made to solve this problem by using the mass media to suggest that this is all supposedly radiophobia (an imaginary radiation danger) and that small doses of ionizing radiation do not do any harm to health. However, the facts show that the health of the population in areas near the Semipalatinsk nuclear test range and in the vast zone around the Chernobyl Nuclear Power Plant is worsening on an increasingly greater scale.

Until recently, biophysicists and radiologists were puzzled by the abrupt worsening in people's health after underground nuclear tests in Kazakhstan, when radiation background levels increased only negligibly over previous levels.

But now it seems an answer has been found! In the mid-1960s we began developing a new original concept of the biophysical mechanisms responsible for the action of electromagnetic radiation (including ionizing radiation). The result of this research is this: At very low intensities, radiation interacts with the living cell in accordance with the principle of the resonant effect. Moreover, the effect is memorized, and subsequent exposure elicits a stronger radiobiological response.

It turns out that resonant tuning arises as a result of the restructuring of the fluid media of the cell and of its plasma structure (the organized system of free electrons and other free elementary particles). The complex of factors accompanying ionizing radiation leaves its imprint on the cell's aqueous and plasma structures. The cell acquires heightened sensitivity to any minor changes in the radiation level and to secondary processes associated with them.

The aqueous environment of the living cell, which in a sense "memorizes" the effect by changing its structure, plays an especially important role in this reaction. It turns out that not only the water in the living cell, but also the water of the surrounding environment "memorizes" radiation exposure and changes its own properties.

It was in this way that Kazakh scientists discovered the resonant spectral memory of liquid media. Prof. A. Lukyanov, a prominent specialist in mathematical modeling, created a model of the resonant spectral memory of water and conducted a number of physical experiments confirming presence of long-term memory in

liquid media. It turns out that such "memory" may also be present in solids and even in gases. It follows from an interesting experiment conducted by chemist A. Gorokhov that catalytic reactions may occur on the basis of the "memory" in aqueous solutions in the absence of a catalyst. And water is extremely responsive even to thermal influences, which correspondingly affects the rate of chemical reactions.

Our experiments showed that the effects of small doses of radiation are intensified several times over primarily because of the presence of a "memory" in the aqueous and plasma environment of living cells and because of secondary indirect action by way of an aqueous medium and other fluids when they are used, for example, in nutrition. Increasingly larger numbers of abnormal aqueous and plasma structures appear in cells, which leads to pathology, and primarily to a drop in immunity. **Immune deficiency is the most terrible effect of nuclear tests and nuclear power plant accidents. The consequences for current generations and for the next two or three generations may be tragic if extreme measures are not implemented for bioenergetic rehabilitation of man and his habitat.**

Is there a way out of this "nuclear dead end"? Yes, such a way out does exist, and it was discovered in connection with research on the "memory" of the aqueous and plasma structures of the living cell. We can already propose a global system of bioenergetic rehabilitation of man and his habitat following radiation injury. The main objective of bioenergetic rehabilitation is to replace aqueous structures and to erase the "pathological memory."

Considerable experimentation has been conducted on many elements of bioenergetic rehabilitation. Laser activation—one of the elements of bioenergetic rehabilitation following severe radiation injury to the blood, muscles and other tissues—has been shown to be highly effective. Such experiments were conducted in the Scientific Research Institute of Evolutional Morphology and Ecology of Animals imeni Severtsev of the USSR Academy of Sciences. They completely confirmed the conclusions of Kazakh biophysicists.

But creation of a system of bioenergetic rehabilitation requires special laser devices and spectral thermal chambers, water with a particular chemical composition that has been treated under high pressure and has been subjected to mechanical processing, containers to store various modifications of water, and a system of quick biophysical diagnosis. Special zones must be created for bioenergetic rehabilitation in Kazakhstan where favorable conditions for this exist (the tail water of the Bukhtarminskaya GES, Serebryansk; the Kapchagayskaya GES, Kapchagay, etc.).

We sent a letter concerning this to the USSR Ministry of Health immediately following the Chernobyl accident, proposing that we conduct mass rehabilitation of persons who had worked at the nuclear power plant following the accident. The ministry politely rejected our proposals, citing the existence of many other resources by means of which it could neutralize the effects of radiation injury. Time has shown that damage to the health of the population around Chernobyl is increasing with every year. The same can also be said for the areas of Semipalatinsk, Karaganda and Pavlodar oblasts contiguous to the Semipalatinsk test range.

We need to take emergency measures right now for bioenergetic rehabilitation of the population, after which similar measures need to be implemented in relation to animals, plants and water basins. If we are unable to create bioenergetic rehabilitation services and zones in the next few years, the losses in terms of public health will grow catastrophically.

Trials with Vaccine Against Anthrax Strain 55

907C0263 Moscow VETERINARIYA in Russian No 8, Aug 89 pp 7-10

[Article by N. G. Ipatenko, N. T. Tatarintsev, A. A. Manichev, V. A. Sedov, V. N. Gushchin, A. L. Revazov, A. V. Gutiyev, A. N. Gutiyev, S. I. Bakhtarov, V. A. Krutskikh, Yu. T. Kiselev, A. A. Muryy and V. I. Grigorov]

[Abstract] Extensive veterinary clinical trials conducted with the newly approved vaccine based on attenuated anthrax bacillus strain 55 have shown that a single immunization provides protection for about one year. The vaccine, in addition to being highly immunogenic, is also reactogenic and retains its potency for 4 years in the lyophilized state and 2 years in the liquid form at 4°C. The vaccine is administered subcutaneously to small domestic animals at the age of 3 months in a 0.5 ml dose containing 10-12.5 million viable spores. For other species and fur-bearing animals, a dose of 1 ml is recommended. In general, this vaccine has been found superior to the STI vaccine currently in use.

UDC 619:615.779.9:616.981.136

Influence of Antibiotics on Lesteria in Chick Embryo Fibroblast Culture

907C0185B Moscow VETERINARIYA in Russian No 7, Jul 89 pp 34-36

[Article by I. A. Bakulov, Yu. V. Chislov, V. M. Kotlyarov, All-Union Scientific Research Institute of Veterinary Virology and Microbiology]

[Abstract] A study is made of the effectiveness of rifampicin, erythromycin and doxycycline on listeria in a chick embryo fibroblast culture. The strain listeria monocytogenes 766 was used, which has properties typical of the listeriosis pathogen. Rifampicin and erythromycin added to the cultures at 1 μg/ml decreased the number of viable listeria within the fibroblast by a factor of 10, in the surrounding medium by a factor of 1,000. Doxycycline in the same quantity halted the growth of intracellular microorganisms and decreased the number of viable extracellular microorganisms by a factor of 10, indicating that these preparations are promising for listeriosis treatment. Figures 2; References 6: 4 Russian, 2 Western.

Effectiveness of Vaccine From Strain 82 in Brucellosis Control

907C0185A Moscow VETERINARIYA in Russian No 7, Jul 89 pp 15-16

[Article by N. Nazarov, N. K. Abdurakhmanov, Oblast Veterinary Laboratory, Semipalatinsk Oblast, Kazakh SSR]

[Abstract] Cattle innoculated with the old strain 19 brucellosis vaccine tend to lose immunity in a year or two, which has resulted in epizootic situations in the past. The use of strain 82 was initiated in 1974, and by 1976, it accounted for more than 90% of the vaccinations. This strain has a number of advantages over the earlier strain, particularly its slight agglutination tendency. Use of the new vaccine, with vaccination in the spring, repeated two years later, has reduced brucellosis morbidity sixfold. Infectivity among the animals was reduced 10-fold, and the number of infected farm areas, 22-fold. Remaining problems stem from improper use of the vaccine on individually held cattle.

UDC 578.828.6.083.2

Investigation of Human Immunodeficiency Type I Viral Strains Isolated From Three Patients by Means of Molecular Hybridization

907C0130E Moscow VOPROSY VIRUSOLOGII in Russian Vol 34 No 3, May-Jun 89 (manuscript received 5 Jul 88) pp 342-343

[Article by M. I. Bukrinskiy, I. R. Bryune and L. L. Bartelemi, Institute of Virology imeni D. I. Ivanovskiy, USSR Academy of Medical Sciences, Moscow; Laboratory of AIDS Investigation and Diagnosis, Havana, Cuba)

[Abstract] The most widely used techniques for AIDS diagnosis are based on various versions of solid-phase enzyme immunoassay (EIA) which detect antibodies to human immunodeficiency virus (HIV). Although simple and highly sensitive, they have a substantial drawback in that normal sera sometimes cross-reacts with HIV proteins (especially p24 and p55), resulting in so-called false positives, which require subsequent differential diagnosis. A convenient method for such diagnosis—one that enables direct identification of virus-specific sequences in infected cells—is molecular hybridization, which also enables a comparison of provirus structure, a process that is extremely important in AIDS epidemiology. The sensitivity of this test is rather high, permitting detection at the level of 10^{-10} g of viral nucleic acids. In this work molecular hybridization method was used to confirm the diagnosis and analysis of the structure of provirus in T-lymphocyte cells obtained from three patients in Cuba. The results showed that the molecular hybridization method can indeed be used to verify presence of HIV in the cells. The dot hybridization method indicates the level of the production of virus by the infected cells, which is correlated with the disease stage. The blot hybridization method makes it possible to compare the structure of genomes isolated from various patients. Figures 3; references 11: 1 Russian, 10 Western.

UDC 615.281:578.8:547.575.576.076.7

Antiviral Activity of Aldehydephenol and Aldehydenaphthol Derivatives and Sugar Derivatives

907C0130c Moscow VOPROSY VIROLOGII in Russian Vol 34 No 3, May-Jun 89 (manuscript received 22 Apr 88) pp 315-319

[Article by G. Sh. Achilova, S. A. Auyelbekov, Kh. A. Aslanov and I. F. Barinskiy, Tashkent University imeni V. I. Lenin; Institute of Virology imeni D. I. Ivanovskiy, USSR Academy of Medical Sciences, Moscow]

[Abstract] The goal of this work was to investigate the toxicity and antiviral activity of aldehydephenols and aldehydenaphthol derivatives that are fragments of the natural polyphenol gossypol and contain the N-β-aminoethyl derivatives of diethylamine, piperidine and morpholine, as well as the toxicity and antitumor activity of various derivatives of 2-amino-2-desoxy-D-glucose with various aldehydes. The authors also performed a comparative study of the antiviral properties of 2-hydroxybenzylamine and its synthetic derivatives N-D(+) glucoside, N-D(+) maltoside and N-D(+) lactoside. The benzaldehyde derivatives proved to be the most toxic of the compounds, with poor antiviral activity. The appearance of a hydroxyl group in an aromatic nucleus was accompanied by an intensification of the biological properties of the synthetic substances. Thus, the 2-hydroxybenzaldehyde derivatives demonstrated pronounced antiviral activity. One N-β-aminoethyl derivative reduced infectious activity by 2.0-2.5 lg TCD_{50}/ml. Position of the hydroxy group had a substantial effect on the manifestation of antiviral activity. The 2-hydroxybenzaldehyde derivatives were the most active of the glucose derivatives, suppressing infectious activity by 2.3-3.0 lg TCD_{50}/ml. The 2-hydroxybenzylamine derivatives, at doses of 150-500 μg/ml, reduced viral concentration by 2.0-3.3 TCD_{50}/ml. The derivatives with disaccharides were more active than those with monosaccharides. The data obtained with regard to the 2-amino-2-desoxy-D-glucose point to the interrelationship of chemical structure and antiviral activity: the presence of a phenol group increased the antiviral activity of the aromatic compounds, with the orthoisomers more active than the paraisomers. Addition of mono- and disaccharides to 2-hydroxybenzylamine lowered its toxicity and intensified its antiviral action. Thus it would appear that one should look for additional antiviral compounds among phenol derivatives. Figures 3; references 9: 6 Russian, 3 Western.

UDC 616.98:578.828.6]-078.73

Identification and Quantitative Determination of HIV Antigen During the Production of Serodiagnostic Tests for AIDS

907C0130a Moscow VOPROSY VIRUSOLOGII in Russian Vol 34 No 3, May-Jun 89 (manuscript received 21 Apr 88) pp 305-308

[Article by S. S. Marennikova, G. R. Matsevich, E. M. Shelukhina, V. V. Pokrovskiy, I. A. Okunev, O. A. Zhukova, L. G. Stepanova, M. N. Nosik and O. G. Andzhaparidze, Scientific Research Institute of Viral Preparations, USSR Academy of Medical Sciences, Moscow]

[Abstract] One of the important elements of the production of diagnostic test systems for the identification of antibodies to human immunodeficiency virus (HIV) is the control of the antigen content at different stages of the production, beginning with the determination of antigen quantity in the culture fluid and ending with the examination of the final series of concentrated, highly purified virus used for producing the immunosorbent.

The authors describe the use of modified enzyme immunoassay (EIA) for that purpose. In the assay, IgG-antibodies isolated from sera of HIV infected individuals are used in preparation of the immunosorbent and peroxidase conjugate. It was shown that sera from individuals (AIDS patients or HIV infected individuals) with titers of 20,000-40,000 consistently produced immune reagents sufficiently active for the EIA. The method enabled identification of the HIV antigen in native culture fluid in titers ranging from roughly 27 to 729; a 200-fold concentration of the virus increased the antigen titers to the level of 2,000-6,000, and a 2,000-fold concentration gave titers of 20,000-60,000. Selective studies also revealed that high antigen titers in the culture fluid corresponded to a high percentage (as much as 65%) of antigen-containing cells and to signs of intense HIV production. The lowest concentration of identifiable HIV antigen was found to be in the range of 25-50 ng/ml, depending on the purity of the material. It was also shown that a single determination at a dilution of 1:9 was adequate for determining titer of the virus-containing materials under study. Figure 1; references 7: 2 Russian, 5 Western.

UDC 575:576.8

Bac. Subtilis A2 Mutant With Increased Ability to Induce Adaptive Response

18402081b Moscow IZVESTIYA AKADEMII NAUK SSSR; SERIYA BIOLOGICHESKAYA in Russian No 2, Mar-Apr 89 (manuscript received 29 Dec 85) pp 198-203

[Article by O. V. Lotareva, Institute of General Genetics imeni N. I. Vavilov, USSR Academy of Sciences, Moscow]

[Abstract] Preincubation of some bacteria with small doses of alkylating agents makes them resistant to lethal and mutagenic effects of the same agents taken at higher doses; this is called "adaptive response" (AR) and is the result of the synthesis of certain enzymes: O^6-methylguanine-DNA-methyltransferase, N-3-methyladenine-DNA-glycosylase, DNA-polymerase, etc. A mutant A2 was isolated from Bac. subtilis showing increased AR. This mutant was more resistant to mutagenic action of N-methyl-N'- nitro-N-nitrosoguanidine (MNNG), ethylmethanesulfonate (EMS) and UV light, but more sensitive to the lethal effect of MNNG and UV than the parent strain 103. Clonal analysis of mutant colonies formed by the mutant cells A2 and parent 103 showed that the A2 strain had increased ability to form complete mutants induced by MNNG, methylmethanesulfonate and the UV. The properties of the A2 mutant suggest that during the AR induction process, an expression takes place of not only the specific repair enzymes but also of the nonspecific ones whose synthesis is under control of the Ada gene. Figures 3; references 16: 1 Russian, 15 Western.

Experimental Infection of Bloodsucking Arthropoda by Isfahan Virus

18402090A Ashkhabad IZVESTIYA AKADEMII NAUK TURKMENSKOY SSR: SERIYA BIOLOGICHESKIKH NAUK in Russian No 1, Jan-Feb 89 pp 66-67

[Article by V. G. Sadykov, N. V. Khutoretskaya, and V. A. Aristova]

[Abstract] The Isfahan virus (Rhabdoviridae family, Vesiculovirus genus) was first isolated in Iran, and then in the Turkmen SSR, from the sandfly Phlebotomus papatassi. In recent years, however, it has also been isolated from the tick Hyalomma asiaticum and the mosquito Aedes caspius. To provide an experimental confirmation of infection of arthropods of these dissimilar species, the authors infected laboratory lines of H. asiaticum ticks and Ae. aegypti mosquitoes with Isfahan virus strain T-227 in suspension. The results showed that the virus can exist, reproduce and maintain high titers over a period of a month to a month and a half in the species tested. References 5: 4 Russian, 1 Western.

All-Union Parapsychology Conference Held In Moscow

907C0179 Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 2 Dec 89 p 4

[Interview with Vladimir Ivanovich Dokuchayev, candidate of physical-and-mathematical sciences and participant in the first all-union parapsychology conference, under the rubric "Interview for This Issue": "On the Crest of a New Wave"]

[Abstract] The first All-Union Conference on Energy-Information Exchange In Nature discussed a broad range of problems of parapsychology, bioenergetics and psychotronics. In this article, an interview is presented with candidate of physical and mathematical sciences V. I. Dokuchayev, who claims to have developed a theory of longitudinal waves that are similar to ordinary or transverse electromagnetic waves, but are capable of penetrating any shield, any metal, and even earth. Dokuchayev says he successfully defended the theory in his dissertation at the Combined Institute of Nuclear Research. He has developed simple equipment for producing such waves, whose applications in communications for miners and for submarines are obvious. Also, instruments which record electric fields with longitudinal components can be used for comprehensive diagnosis of the status of an entire organism, as opposed to instruments for receiving transverse or traditional electric fields which can only diagnose the status of individual organs. This can be used for early diagnosis of diabetes and other diseases which cannot be detected in their early stages by traditional medicine. Dokuchayev claims that longitudinal waves can be used to affect individual genes that code for specific functions and structure in the body. Longitudinal waves can also destroy cancer cells. Dokuchayev briefly mentions his ability to cause the needle of a compass to spin without touching it and to move light objects around by telekinesis, then notes that he has developed a general theory of electrodynamics which explains gravity and which he has used to create antigravity. He predicts that aircraft of the future will fly by his antigravity effect, thus requiring no fuel and producing no pollution. Dokuchayev claims that, if sponsored, he could build a working model of antigravity flight within a year and that interplanetary flight could probably be based on a similar principle, such as flight based on interaction with particles and antiparticles in space.

USSR, Italy Cooperation on Neuroscience Problems

907C0146 Moscow MEDITSINSKAYA GAZETA in Russian 9 Jul 89 p 4

[Article by I. Neklyudov, under the rubric "Facets of Cooperation": "USSR-Italy: The 'Fidia' Partner"]

[Abstract] In 1988, an agreement was signed by the All-Union Scientific Center of Mental Health and the Italian Corporation Fidia for scientific cooperation in the field of neuroscience. Recently, a decision was made to set up laboratories at the USSR Academy of Medical Sciences All-Union Scientific Center of Mental Health for neurochemistry, molecular genetics, and molecular pharmacology and two projects studying the synaptic plasticity of human brain. Young scientists at the center will direct the work, whose basic research will help to identify the mechanisms underlying conditions such as psychoses and Alzheimer's diseases. The Italian side will finance the studies with convertible currency. Representatives from both sides attended the ceremonial opening of this venture, among them I. N. Denisov (USSR deputy minister of health), V. I. Pokrovskiy (president of the USSR Academy of Medical Sciences), F. Della Valle (director general of Fidia), Nobel laureate T. Levi Montalchini, E. Costa (member of US National Academy of Sciences), M. Ye. Vartanyan (the Center's director), and others. An Italian-USSR symposium was held in Moscow during the same time on psychiatric help, psychopharmacology and gerontology. Dr. E. Arengi, president of Fidia, stated that this is the company's second international undertaking, the first having been set up in Washington, DC, four years ago; another center is being planned for Peking. Montalchini and Vartanyan expressed great expectations from this new undertaking.

Azerbaijan Snake Venom Production Increased for Export

907C0151C Moscow MEDITSINSKAYA GAZETA in Russian 2 Aug 89 p 4

[Article by M. Melkonyan, special correspondent for MEDITSINSKAYA GAZETA: "From Snake Venom to Clay"]

[Text] "Gyurza is a poisonous snake from the adder genus," explains the Russian dictionary, but the deadly venom is in fact saturated with active proteolytic enzymes and, in microdoses, can have a directed pharmacologic effect. Gyurza venom is highly valued in world markets. In the USSR, Azerbaijan has a near monopoly for its procurement, but the local herpetological (snake-breeding) combine operates below capacity, hardly meeting the demand of the Tallin Chemical Pharmaceuticals Factory.

Recently, the enterprise set out on a new course. It was transferred to the administration of the Ministry of Health of Azerbaijan SSR. Specifically, it became a component of the new scientific-production association Farmakologiya i narodnaya meditsina [pharmacology and folk medicine]. In the next 1 or 2 years procurements of Gyurza venom is to nearly double to a level of 5 kg per year. One would think that 5 kilos is not a whole lot! Yet, it is sufficient to meet the orders of the country's pharmacological industry and leave a share for itself for research purposes. The enterprise plans to study the pharmacologic capabilities of the individual fractions of the venom and even to export this unique material. This in turn promises to bring in hard currency that will enable the new scientific-production association to solidly stand on its own two feet.

Medzhid Aliyev, a professor at Azerbaijan Medical Institute and director of the scientific-production association Farmakologiya i narodnaya meditsina, describes its plans:

"Besides production sections, the enterprise will have research departments: the folk medicine unit and the unit of clinical pharmacology with a network of research labs. Azerbaijan has an abundance of natural medicinal materials. Our chief objective is to concentrate our efforts on processing them. We will create new effective phytopreparations. The cooperative Fito has become our partner. It has already introduced two new sorts of medicinal tea based on recipes from scientific associates of the pharmacology department: one for common cold and the other a tonic tea named 'Pesney gor' [Mountain Song]. It helps metabolic processes and relieves stress. Tea is produced in disposable packets.

"Besides new medicinal formulations of plant origin, we plan to develop preparations from bentonite—the suds-forming clay rich in trace elements. People on Apsheron Peninsula, where it is found, have been aware of its medicinal properties since time immemorial.

"In describing our new scientific-production association, I will mention another division: the breeding unit. We will breed genetically pure laboratory animals badly needed by experimenters."

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