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USSR: Life Sciences

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USSR: LIFE SCIENCES

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BALLISTOCARDIOGRAPHY IN WEIGHTLESSNESS RESEARCH

Moscow VESTNIK AKADEMII MEDITSINSKIKH NAUK SSSR in Russian No 6, Jun 87
(manuscript received 26 Dec 86) pp 77-84

[Article by R. M. Bayevskiy, I. I. Funtova and M. D. Zakatov,
Institute of Biomedical Problems, USSR Ministry of Health, Moscow]

[Abstract] A review is presented of advances in ballistocardiographic studies during weightlessness aboard Salyut-6 and -7 spaceships, as well as in controlled ground experimentation. The latter involved ten 19 to 20-year-old males subjected to antiorthostatic kinesia for prolonged periods of time to simulate weightlessness. In general, the results of both series were in agreement. Over a 90-day period three basic phases of changes in cardiac contractility were identified. The initial stage was a diminished mechanical activity of the right heart. The second stage consisted of enhanced contractility of the right ventricle with simultaneous reduction in the contractility of the left heart. The final stage was a reversal of the phenomenon in the second stage, i.e., enhanced contractility of the left ventricle with concomitant reduction in contractility of the right heart. Further developments in ballistocardiographic techniques and equipment will lead to an expanded use of this technology in clinical medicine, following its initial development for space physiology. Figures 5; references 10: 7 Russian, 3 Western.

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CENTRAL HEMODYNAMICS IN ANTIORTHOSTATIC HYPOKINESIA AND IMMERSION MODELS OF WEIGHTLESSNESS

Moscow VESTNIK AKADEMII MEDITSINSKIKH NAUK SSSR in Russian No 6, Jun 87
(manuscript received 26 Dec 86) pp 71-77

[Article by V. Ye. Katkov, L. I. Kakurin (deceased), V. V. Chestukhin and E. M. Nikolayenko, Institute of Biomedical Problems and Scientific Research Institute of Transplantology and Artificial Organs, USSR Ministry of Health, Moscow]

[Abstract] A comparative study was conducted on the physiological effects of antiorthostatic hypokinesia (15° body angle) and 'dry immersion' on central hemodynamics in weightlessness simulation research. The experiments were conducted over a period of 7 days with 17 healthy males (33 years old) divided into two groups. The central hemodynamic parameters were more affected by immersion in the initial hours of the experiment, presumably due to the primary effects of immersion. Stabilization of the various hemodynamic parameters was seen in 2 to 3 days in both experiments, and within 7 days there were no significant differences between the groups. These observations were interpreted to indicate that both experimental approaches lead to essentially identical data on the effects of weightlessness and are equally suitable for onboard experimentation in space stations. This is particularly applicable to monitoring of central venous pressure, whereas the other hemodynamic parameters still require additional studies. Within 1 day of the experiment the central venous pressure fell from a control value of 4.1 mmHg to 2.1 mmHg, decreasing to 1.7 mmHg by day 7. Similar results had been obtained aboard Space Lab-1. Figures 4; references 15: 3 Russian, 12 Western.

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AUTOMATED HYDROPONIC INSTALLATION FOR GROWING PLANTS UNDER CONDITIONS OF
ECOLOGICAL STRESS

Dushanbe DOKLADY AKADEMII NAUK TADZHIKSKOY SSR in Russian Vol 29, No 11
Nov 86 (manuscript received 13 Jun 86) pp 690-692

[Article by P. M. Yevlakov, V. K. Kichitov and I. S. Kasparova, Institute of
Physiology and Biophysics of Plants, Tajik SSR Academy of Sciences]

[Abstract] A new automatic hydroponic installation was developed to provide further improvement of methods of conducting experiments on the influence of ecological stress on the photosynthetic characteristics of plants. The installation includes a 250 liter reservoir, vegetation and vessels 35 cm high and 30 cm in diameter, an air compressor and a programmer, which determines the length and frequency of periods of operation of the air compressor which feeds the nutrient solution into the vegetation vessels. The installation brings experiments on the influence of ecological stress on plants to a high methodologic level, reducing nonproductive expenditures of experimenter's time and decreasing manual labor. Figures 2; references: 9 Russian.

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EFFECT OF TOXIN FROM RADIANTHUS MACRODACTYLUS ON PERMEABILITY OF BIOLOGICAL AND MODEL MEMBRANES

Moscow BIOLOGICHESKIYE MEMBRANY in Russian Vol 4, No 3, Mar 87
(manuscript received 10 Sep 86) pp 243-248

[Article by A. S. Ivanov, A. A. Monar, E. P. Kozlovskaya and M. M. Monastyrnaya, Scientific Research Institute of Physical-Chemical Medicine, RSFSR Ministry of Health, Moscow, Pacific Ocean Institute of Bioorganic Chemistry, Far Eastern Science Center, USSR Academy of Sciences, Vladivostok]

[Abstract] A study was made of the effect of hemolysin from Radianthus macrodactylus (RTX) on the permeability of erythrocytes, sea urchin egg cells and liposomes. The hemolytic activity of the preparation was approximately 20,000 hemolytic units per ng of protein, 45.5 ng of protein per hemolytic unit. The specificity of interaction of the toxin with the sphingomyelin of the membranes was found to be quite high. The concentration of toxin inducing ion permeability of the sphingomyelin-containing liposomes corresponded to the effective concentration causing loss of K^+ ions and hemolysis of erythrocytes. Figures 4; references 18: 8 Russian, 10 Western.

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UDC 577.352.465:577.182.423

STABILIZING EFFECT OF DI-SEC-BUTYL DIBENZO-18-CROWN-6 AND VALINOMYCIN ON SARCOPLASMIC RETICULUM MEMBRANES

Moscow BIOLOGICHESKIYE MEMBRANY in Russian Vol 4, No 3, Mar 87
(manuscript received 10 Apr 85; after revision 21 Apr 86) pp 249-253

[Article by M. V. Zamarayeva, S. N. Klyuyev, A. I. Gagelgans, I. I. Ismailov and A. K. Tashmukhamedova, Institute of Physiology, Uzbek SSR Academy of Sciences, Tashkent]

[Abstract] Di-sec-butyl dibenzo-18-crown-6 is a macrocyclic polyster, an effective inducer of permeability in mitochondrial membranes and bilayer lipid membranes for the K^+ , Mg^{2+} and H^+ ions. In the sarcoplasmic reticulum membranes,

this crown ether normalizes the rate of transport of Ca^{2+} and its energy effectiveness following long-term storage of membrane preparations. This article studies the influence of the cyclopolyether of the sarcoplasmic reticulum membranes under various conditions leading to "separation" of the transport of Ca^{2+} and hydrolysis of ATP. The results indicate that regardless of the method of induction of passive permeability in sarcoplasmic reticulum membranes, di-sec-butyl dibenzo-18-crown-6 decreases the permeability, increasing the $\text{Ca}^{2+}/\text{ATP}$ ratio. Valinomycin has a similar effect. Figures 3; references 10: 9 Russian, 1 Western.

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UDC 577.150

ISOLATION OF LYSOPHOSPHOLIPASE BY BIOSPECIFIC CHROMATOGRAPHY

Tashkent KHIMIYA PRIRODNYKH SOYEDINENIY in Russian No 2, Mar-Apr 87
(manuscript received 20 Oct 86) pp 312-314

[Article by I. T. Yakubov, M. U. Tychubaev, R. A. Akhmedzhanov and M. M. Rakhimov, Tashkent Order of Labor Red Banner State University V. I. Lenin

[Abstract] Lysophospholipases are natural components of the poisons of snakes and insects, defining their biological activity. The authors have isolated an enzyme, with lysophospholipase activity, from the poison of a hornet by gel filtration and ion-exchange chromatography. However, the yield was very low. Therefore, they have now synthesized a special adsorbent for biospecific chromatography of lysophospholipases. The adsorbent was synthesized by a method described earlier for synthesis of a group biospecific adsorbent based on polyamide, using lysophosphatidyl ethanolamine as a ligand. The lysophospholipase was purified by adsorption on the special adsorbent and desorption in a solution of ammonia, neutralization and lyophilization. The lysophospholipase obtained was highly pure. At the N-end of the enzyme is phenylalanine; at the C-end is lysine, as was earlier reported. Figure 1; references 9: 5 Russian, 4 Western.

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BIOLUMINESCENT METHOD FOR DETERMINATION OF NADPH DEHYDROGENASES

Moscow PRIKLADNAYA BIOKIMIYA I MIKROBIOLOGIYA in Russian Vol 23, No 2, Mar-Apr 87 (manuscript received 8 Apr 85) pp 270-274

[Article by V. N. Petushkov, L. P. Shefer, N. S. Rodionova and A. M. Fish, Institute of Biophysics, Siberian Department, USSR Academy of Sciences, Krasnoyarsk]

[Abstract] A bioluminescent analytical method was designed for the determination of NADPH dehydrogenase activity, based on the use of highly-purified luciferase and NADH:FMN oxidoreductase isolated from *Beneckea harveyi*. The analysis was conducted at 30°C in 0.1 M Na-phosphate buffer, pH 7.0, with the reaction initiated by the addition of 6×10^{-7} M NADH, i.e., a concentration far below that of the K_M value for a given dehydrogenase. Dehydrogenase activity was determined from the exponential decrease in fluorescence at 440-500 nm. The respective upper and lower limits of detection of porcine myocardial lactate dehydrogenase were 2×10^{-6} and 1×10^{-7} M, respectively, those for yeast alcohol dehydrogenase 6×10^{-6} and 6×10^{-8} M, and those for NADPH:FMN oxidoreductase 2×10^{-6} and 6×10^{-8} M. Figures 7; references 11: 6 Russian, 5 Western.

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STRUCTURE OF [MeAla^{2,6}] OCTAVALINOMYCIN cyclo[-(D-Val-L-MeAla-L-Val-D-HYi)₂-] IN CRYSTALS

Moscow BIOORGANICHESKAYA KHIMIYA in Russian Vol 13, No 5, May 87 (manuscript received 1 Sep 86; after revision 3 Dec 86) pp 581-591

[Article by A. D. Vasilyev, G. N. Tishchenko and V. I. Simonov, Institute of Crystallography imeni A. V. Shubnikov, USSR Academy of Sciences, Moscow]

[Abstract] [MeAla^{2,6}] octavalinomycin is the octa analog of the natural antibiotic valinomycin, cyclo[-(D-Val-Lac-Val-D-HYi)₃-], differing in the absence of a third of the polypeptide chain and two N-methylaminine amino acid groups, replaced by lactic acid groups. This article describes the crystalline and molecular structure of the substance. The atomic model is refined considering hydrogen up to divergence factor $R=0.055$. The crystals have spatial symmetry group $P2_12_12_1$ with unit cell parameters $a=16.006$, $b=23.094$, $c=12.024$ Å, $Z=4$. The octadepsipeptide molecules in the crystal have a second order pseudoaxis

of symmetry and have a twisted bracelet conformation, stabilized by two intramolecular 5→1 hydrogen bonds and one 4→1 bond. The structure of the compound in comparison to the structure of other octavalinomycin analogs is discussed. Figures 3; references 22: 10 Russian, 12 Western.

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2-(4-CHLOROPHENYL)SULFONYLETHOXYCARBONYL (Cps)--AMINOPROTECTIVE GROUP FOR SYNTHESIS OF PEPTIDES IN SOLUTION. SYNTHESIS OF [Leu]ENKEPHALIN AND ITS [D-Ala²]ANALOG

Moscow BIOORGANICHESKAYA KHIMIYA in Russian Vol 13, No 6, Jun 87
(manuscript received 24 Jun 86; after revision 25 Nov 86) pp 754-759

[Article by A. N. Sabirov, V. I. Ofitserov, A. F. Shvale and V. V. Samukov, All-Union Scientific Research Institute of Molecular Biology, Koltsovo, Novosibirsk Oblast]

[Abstract] In order to study the possibility of using Cps protection for the liquid-phase synthesis of peptides, the authors undertook synthesis of the [Leu]enkephalin pentapeptide Tyr-Gly-Gly-Phe-Leu (I) and its [D-Ala²] analog Tyr-D-Ala-Gly-Phe-Leu (Ia), which is more resistant to proteinases, by multistage growth of the peptide chain with Cps amino acid derivatives in the direction from the C to the N end. After complete unblocking with CF₃COOH and purification, the pentapeptides were studied by high energy liquid chromatography, mass spectroscopy and amino acid composition analysis. The synthesis demonstrated that the Cps group can be effectively used for synthesis of peptides in solution in combination with C-end and side protective groups resistant to organic bases in nonaqueous solvents. References 9: 1 Russian, 8 Western.

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CSO: 1840/956

AUTOMATED SYNTHESIS OF OLIGODEOXYRIBONUCLEOSIDES. PART 4. USE OF NOVEL EFFECTIVE CONDENSING REAGENT

Moscow BIOORGANICHESKAYA KHIMIYA in Russian Vol 13, No 3, Mar 87
(manuscript received 30 Sep 85, after final revision 23 Jun 86) pp 359-364

[Article by A. I. Lomakin, S. I. Yastrebov, Yu. A. Gorbunov, V. V. Samukov and S. G. Popov, All Union Scientific Research Institute of Molecular Biology, Koltsovo, Novosibirsk]

[Abstract] Solid phase oligonucleotide synthesis is described using a "Victoria-2" synthesizer and protected mono-, di- and trinucleotide blocks in presence of TPS and AMAPO (4,N,N,-dimethylaminopyridine-1-oxide) mixture as the condensing agent. A new carrier was used as the polymer base obtained from silica gel C-80 "Silochrom" containing aminopropyl anchor groups, after double treatment with 6-N-dimethoxytritylaminoacetic acid in presence of MS (MS = mesitylenesulfochloride) and N-methylimidazole, followed by addition of the protected nucleoside. The duration of the condensation process was reduced to 2 to 6 minutes. One cycle of oligonucleotide chain growth lasted about 30 minutes and did not depend on the length of the protected block. Figures 2; references 21: 8 Russian, 13 Western (3 by Russian authors).

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PROSTANOIDS. PART 19. SYNTHESIS OF ^{14}C -LABELED CHLOPROSTENOL

Leningrad ZHURNAL ORGANICHESKOY KHIMII in Russian Vol 23, No 6, Jun 87
(manuscript received 23 Feb 86) pp 1185-1190

[Article by M. S. Miftakhov, N. S. Vostrikov, O. M. Kuznetsov, Yu. G. Kuvatov, Yu. I. Murinov and G. A. Tolstikov, Institute of Chemistry, Bashkir Affiliate, USSR Academy of Sciences, Ufa]

[Abstract] Prostanoids labeled with suitable isotopes are promising for use in human and veterinary medicine. The biomimetic approach, i.e., the possibility of enzymatic cyclization of eucosapolyenic acids to prostaglandins, is a convenient path to labeled prostanoids. This article describes the synthesis of ^{14}C -labeled chloprostamol, suitable for pharmacokinetic studies and use in other biochemical studies. The compound was synthesized on the basis of a mixture of 2- ^{14}C -labeled methyl bromoacetate with nonradioactive bromoacetate, producing labeled dimethoxy-2-oxo-3-(m-chlorophenoxy) phosphonate, used to synthesize the 16- ^{14}C -labeled chloprostamol. The preparation is identical in standard spectroscopic and chromatographic characteristics to a standard specimen of nonradioactive chloprostamol. References 15: 8 Russian, 7 Western.

6508/5915
CSO: 1840/961

OPTICAL SPECTROSCOPY OF CONFORMATION OF NEUROSPECIFIC CARDIOACTIVE GLYCOPROTEINS

Moscow BIOKHIMIYA in Russian Vol 52, No 1, Jan 87
(manuscript received 7 Feb 86) pp 89-95

[Article by R. M. Srapionyan, S. S. Mardanyan, S. A. Sakyan, R. O. Karapetyan, F. M. Sakyan and A. A. Galoyan, Institute of Biochemistry, Armenian SSR Academy of Sciences, Yerevan]

[Abstract] A specific protein component first discovered by Galoyan in 1964 and isolated from the hypothalamic area of the cattle brain represents a special group of glycoprotein-hormonal complexes with unique biological properties. These complexes participate quite effectively in neurohumoral regulation of coronary circulation and a number of metabolic processes in the brain and certain visceral organs. These glycoproteins are precursors of many biologically-active compounds regulating intracellular levels of cyclic nucleotides, participating in glycolysis, glycogenolysis and presynaptic regulation of the liberation of catecholamines in the hypothalamic area of the brain, coronary circulation, etc. This article discusses an investigation of the conformation of these glycoproteins by selective extinction of fluorescence and circular dichroism. The molecules of these proteins are found to manifest differences in many physical properties reflecting the differences in their structural organization. The conformation of BNS differs greatly from that of BNC and BNH. The content of α -spiral structures in BNH and BNC is approximately the same, though significant differences were found in conformation of these proteins as well. Figures 4; references 18: 11 Russian, 7 Western.

6508/5915
CSO: 1840/970

UDC 577.152.1

MUSCLE DIPEPTIDES: NATURAL LIPID PEROXIDATION INHIBITORS

Moscow BIOKHIMIYA in Russian Vol 52, No 5, May 87 (manuscript received 15 May 86)
pp 782-787

[Article by A. M. Dupin, M. Betanandzara, S. L. Stvolinskiy, A. A. Boldyrev and S. Ye. Severin, Department of Biochemistry, Biological Faculty, Moscow State University imeni M. V. Lomonosov]

[Abstract] A study is presented of the antioxidant properties of the natural dipeptides carnosine and anserine under conditions of induced lipid peroxidation in the sarcoplasmic reticulum of skeletal muscles. It is found that one significant function of the dipeptides may be their inhibiting effect on peroxidation of lipids in muscle cell membrane structures. This brings up the question of why the compounds are absent or present in very small quantities in other

tissues for which a high level of lipid peroxidation is also characteristic. The muscle tissue of the heart contains a large quantity of α -tocopherol, capable of preventing the development of lipid peroxidation by bonding free radicals. It is possible that the dipeptides perform a similar function of controlling peroxidation of lipids in the skeletal muscles. The difference in the mechanism of their action and that of α -tocopherol may be related to the specific functioning of the cardiac and skeletal musculature. Figures 5; references 16: 10 Russian, 6 Western.

6508/5915
CSO: 1840/970

UDC 577.152.1

SUPEROXIDE-SCAVENGING ACTIVITY OF CARNOSINE IN PRESENCE OF COPPER AND ZINC IONS

Moscow BIOKIMIYA in Russian Vol 52, No 7, Jul 87
(manuscript received 21 Jul 86) pp 1216-1220

[Article by N. V. Gulyayeva, Institute of Higher Nervous Activity and Neurophysiology, USSR Academy of Sciences, Moscow]

[Abstract] It has been suggested that complexes of carnosine with Cu^{2+} and Zn^{2+} may have effective O_2^- -scavenging capacity, playing a significant role in the antioxidant effect of this dipeptide in vivo. This article tests this suggestion by studying the interaction of carnosine in the presence of Cu^{2+} - Zn^{2+} with superoxide anion radicals. Histidine was also studied to determine the role of histidine in superoxide scavenging activity of carnosine complexes and the possible specificity of superoxide-scavenging activity by carnosine complexes in comparison to histidine complexes. It is concluded that in solutions the ions Cu^{2+} and Zn^{2+} form complexes with carnosine and histidine which have superoxide scavenging activity. Zn-carnosine and Zn-histidine are least effective in general, though at low concentrations the effectiveness of complexes with Zn^{2+} is higher than that of complexes with Cu^{2+} . The results of the work indicate that complexes of carnosine with copper and particularly with copper and zinc do have superoxide scavenging activity, manifested for carnosine at concentrations comparable to those in the skeletal muscles over a broad pH range. The superoxide-scavenging activity of histidine-containing carnosine and anserine dipeptides makes a significant contribution to supporting the physiological function of these dipeptides. Figures 3; references 20: 9 Russian, 11 Western.

6508/5915
CSO: 1840/970

SYNTHESIS AND BIOLOGICAL ACTIVITY OF CYCLICAL ANGIOTENSIN ANALOGS

Moscow BIOORGANICHESKAYA KHIMIYA in Russian Vol 13, No 2, Feb 87
(manuscript received 12 Mar 86; after revision 4 Jun 86) pp 149-159

[Article by D. A. Biseniyetse, Yu. Ye. Antsans, N. V. Myshlyakova, G. G. Kubluk, Ye. A. Porunkevich, M. P. Ramkevich, G. I. Chinens, Institute of Organic Synthesis, Latvian SSR Academy of Sciences, Riga]

[Abstract] One linear and four cyclical analogs of angiotensin were synthesized. Biological studies of the cyclical angiotensin analogs indicated a manifest depressor effect on the blood pressure of rats following i/v administration. The substances were found not to interact with the specific angiotensin receptors in the smooth musculature. Figures 4; references 20: 4 Russian, 16 Western.

6508/5915
CSO: 1840/955

DETERMINATION OF INTERPROTON DISTANCES IN PEPTIDES BY TWO-DIMENSIONAL NUCLEAR OVERHAUSER EFFECT SPECTROSCOPY. CONFORMATION OF CYCLICAL ANALOG OF 'SUBSTANCE P' IN SOLUTION

Moscow BIOORGANICHESKAYA KHIMIYA in Russian Vol 13, No 2, Feb 87
(manuscript received 26 May 86) pp 168-176

[Article by Yu. B. Saulitis, E. E. Liyepinsh, Institute of Organic Synthesis, Latvian SSR Academy of Sciences, Riga]

[Abstract] A method is suggested for quantitative measurement of the interproton distances in peptides and proteins, based on determination of the intensity of nuclear Overhauser effect cross peaks in NOESY spectra. Practical application is demonstrated by determining the interproton distances in a cyclical analog of substance P. The method is applicable for conformationally rigid protein-peptide molecules or their sections, if the interproton distances are constant. The method yields an unambiguous determination of the spatial structure of small peptides. Figures 5; references 26: 3 Russian, 23 Western.

6508/5915
CSO: 1840/955

STUDY OF BACTERIORHODOPSIN TOPOGRAPHY BY TRITIUM PLANIGRAPHY METHOD

Moscow BIOORGANICHESKAYA KHIMIYA in Russian Vol 13, No 7, Jul 87
(manuscript received 16 Sep 86) pp 898-907

[Article by T. N. Alenycheva, A. B. Kuryatov, L. P. Antropova,
V. V. Shemyakin, L. A. Neyman, V. I. Tsetlin and V. T. Ivanov, Institute of
Bioorganic Chemistry imeni M. M. Shemyakin, USSR Academy of Sciences, Moscow]

[Abstract] Tritiated planigraphy was used to identify polypeptide chain fragments inside protein membranes or on their surfaces using bacteriorhodopsin as the test object. Purple membranes, partially cleaved with papain or sodium borohydride were treated with thermally-activated tritium, and the tritium content was determined at each step of the Edman degradation in large peptide fragments (4-65, 73-231 and 156-248), as well as in shorter fragments obtained by cyanogen bromide cleavage of the above peptides. It was demonstrated that tritium planigraphy helped to distinguish the intramembrane aminoacid residues and the polypeptide sequences outside the membrane or close to its surface. A model was developed from these data which involved folding of certain regions of bacteriorhodopsin polypeptide chain. In order to be able to use this method independently of other approaches, further studies are necessary to explain the effect of other factors on tritium inclusion: nature of aminoacid residues, amphiphlicity of the spirals, packing density of intramembrane fragments and lipid content on these membranes. Figures 8; references 20: 7 Russian, 13 Western (11 by Russian authors).

7813/5915
CSO: 1840/959

VIEWS OF INSTITUTE DIRECTORS ON COORDINATED BIOTECHNOLOGY PROGRAM

Kiev PRAVDA UKRAINY in Russian 21 Jun 87 p 3

[Article by Ye. Alikhanyan, RATAU correspondent]

[Abstract] A scientific program entitled "Biotechnology" has been set up in the Ukraine, involving 16 institutes of the Ukrainian SSR Academy of Sciences, 75 organizations from 11 union and 6 republic ministries and departments. This article presents a discussion of news of the biotechnology group by F. S. Babichev, Vice President, UkSSR Academy of Sciences; G. Kh. Matsuka, Director, UkSSR Institute of Molecular Biology and Genetics; and V. P. Kukhar, Director, UkSSR Institute of Bioorganic Chemistry. The ability of biotechnology to produce hybrids of higher plants while bypassing ordinary crossing methods is noted. New varieties of wheat, corn and beets have been developed, although Soviet science is below the world level in terms of fundamental research and practical applications of new technology. Shortages are noted of biological reactors, modern materials, electronics, control and monitoring systems and, particularly, qualified personnel. Training of specialists will require extensive utilization of academic institutes, integrating individual areas of academic and university science.

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CSO: 1840/941

UDC 572.5:576.312

TRANSITORY EXPRESSION IN LIVER CELLS OF HSV-1 THYMIDINE KINASE GENE
TRANSFERRED BY POLYOMA-LIKE PARTICLES AND NUCLEOPROTEIN COMPLEXES

Kiev BIOPOLIMERY I KLETKA in Russian Vol 3, No 4, Jul-Aug 87
(manuscript received 19 Sep 85) pp 215-220

[Article by R. A. Zakharyan, Institute of Experimental Biology, Armenian
SSR Academy of Sciences, Yerevan]

[Abstract] A study was conducted on the efficacy of different delivery systems on the expression of HSV-1 thymidine kinase (tk) gene in rat hepatocytes. The transfer systems consisted of polyoma-like particles (PLP), Ca-precipitate of tk gene-bearing plasmid pBR322, and reconstructed nucleosome-like complex.

The tk gene-bearing complexes were administered intravenously to 20-day-old rats to yield 10^5 molecules of the tk gene per liver cell. Polyacrylamide gel electrophoretic studies on tk activity led to differentiation of murine and viral tk activity. In the PLP-treated rats, viral tk activity persisted for 72 h, with maximum expression of the viral tk gene seen within 24 h and amounting to 20% of that displayed by the rat tk gene. Injection of the Ca-precipitate and the nucleosome complex elicited transient expressions of viral tk activity of shorter duration, i.e., 6 and 24 h respectively. Southern blot technique demonstrated the integration of the viral DNA into the hepatocyte nuclear DNA. Additionally, glucocorticoids were found to facilitate the transfer of the tk gene into hepatocytes, but depressed transfer into hepatic endothelial and Kupffer cells. These findings point to the putative usefulness of the PLP approach in gene therapy. Figures 4; references 16: 2 Russian, 14 Western.

12172/5915

CSO: 1840/981

COMPLEMENT FIXATION TEST IN COMBINED EXAMINATION FOR ORNITHOSIS, Q-FEVER,
BRUCELLOSIS AND LEPTOSPIROSIS

Alma-Ata ZDRAVOOKHRANENIYE KAZAKHSTANA in Russian No 6, Jun 87 pp 62-64

[Article by R. S. Averkiyeva, Karaganda Oblast Sanitary-Epidemiologic Station]

[Abstract] The complement fixation test is termed irreplaceable in the diagnosis of syphilis, typhoid fever, ornithosis and rickettsiosis, particularly since results can be obtained in a few hours and analysis of the results is not difficult. Analysis of 30 or 40 serum samples with 4 antigens can be performed in a single working day.

6508/5915

CSO: 1840/933

UDC 575.23:579.25

NUCLEOTIDE SEQUENCES INVOLVED IN IRREGULAR RECOMBINATION BETWEEN PLASMID AND CHROMOSOMAL DNA IN BACILLUS SUBTILIS

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 295, No 4, Aug 87
(manuscript received 16 Feb 87) pp 973-976

[Article by V. I. Bashkirov, F. K. Khasanov and A. A. Prozorov, Institute of General Genetics, imeni N. I. Vavilov, USSR Academy of Sciences, Moscow]

[Abstract] Recombination between DNA molecules without broad homology areas, so-called irregular recombination, is a common phenomenon. The authors have developed a system allowing cloning of sections of recombination "junctions," arising when plasmid DNA is inserted into the *B. subtilis* chromosome. The work utilized a plasmid pGG20 constructed by the authors, consisting of the plasmid *Staphylococcus aureus* pE194 and the plasmid *Escherichia coli* pBR322, joined at site PstI. Selection was based on the plasmid marker of tetracycline sensitivity. The results indicate that DNA gyrase can participate in irregular recombination in *b. subtilis*, and that irregular recombination in this microorganism occurs due to at least two different mechanisms, one of which involves an unknown enzyme. Figure 1; references 7: 1 Russian, 6 Western.

6508/5915
CSO: 1840/964

INCORPORATION OF HUMAN GENE INTO BACILLUS CHROMOSOME

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 18 Jul 87 p 4

[Article by V. Lagovskiy]

[Abstract] The Institute of General Genetics, USSR Academy of Sciences has succeeded in inserting a human gene into the heredity system of *Bacillus subtilis*. An independent strain was thus produced which lives, reproduces and passes on the unusual characteristics coded by the gene. The chromosomes are tightly locked by nature, but a plasmid provides the key to the lock. By grafting a portion of bacterial chromosome plus the human gene to a plasmid the gene was inserted into the heredity program of the bacteria. Bacterial

producers of genetically controlled products are more stable and reliable than previously used plasmid producers. Contacts are now being made with factories to apply the new bacterial enzyme producers to convert lactose to glucose.

6508/5915
CSO: 1840/943

UDC 579.254.2

LIPOSOMAL DELIVERY OF DNA TO SACCHAROMYCES CEREVISIAE PROTOPLASTS

Kiev BIOPOLIMERY I KLETKA in Russian Vol 3, No 1, Jan-Feb 87
(manuscript received 17 Jan 86) pp 35-40

[Article by I. Ye. Kostetskiy and V. A. Kordyum, Institute of Molecular Biology and Genetics, Ukrainian SSR Academy of Sciences, Kiev]

[Abstract] Experimental data are presented on the transformation of *Saccharomyces cerevisiae* protoplasts by liposomally-encapsulated plasmid RB4 bearing bacterial marker Ap^r and yeast gene *leu2*. The plasmid was encapsulated in lecithin:cholesterol (5:1) monolamellar liposomes. Fusion of the liposomes with the protoplasts results in an 8- to 12-fold increase in the rate of transformation over that obtained with free DNA. Presence of liposomal shells in DNA solutions also led to a 5- to 8-fold increase in transformation when the DNA concentration was in the 20-40 $\mu\text{g/ml}$ range, but no effect was obtained with DNA concentrations of 150-200 $\mu\text{g/ml}$. Transformation was also depressed by excessive liposomal concentrations. However, considering that 0.5 μm liposomes may accommodate 20-30 plasmid DNA molecules suggests that liposomes are useful in introducing large numbers of molecules into protoplasts, as well as different plasmids simultaneously. Figures 1; references 12: 5 Russian, 7 Western.

12172/5915
CSO: 1840/980

UDC 578.81

MINI FORMS OF FILAMENTOUS M13 PHAGE

Kiev BIOPOLIMERY I KLETKA in Russian Vol 3, No 1, Jan-Feb 87
(manuscript received 27 Feb 86) pp 43-46

[Article by Ye. B. Paton and A. N. Zhivolup, Institute of Molecular Biology and Genetics, Ukrainian SSR Academy of Sciences, Kiev]

[Abstract] Isolation studies were conducted for mini forms of the M13 bacteriophage through selective evaluation of 20 plaques. The study led to the identification of a series of mini forms containing 14-50% of the complete phage genome. Two miniviruses, M13mp8 and mp9, were analyzed in detail with

BspRI and HpaII restriction enzymes. The resultant evaluation of the DNA structural characteristics of the complete and mini replicative forms demonstrated that the complete virus enabled the miniphages, containing 14% of the complete genome, to replicate. In that sense, the complete M13 phage functioned as a helper virus for the replication of the miniphages. Figures 3; tables 1; references 15: 1 Russian, 14 Western.

12172/5915
CSO: 1840/980

UDC 575.155:575.224.46

REPLICATION OF GENOME SV40-BEARING PLASMID IN MAMMALIAN CELLS

Kiev BIOPOLIMERY I KLETKA in Russian Vol 3, No 3, May-Jun 87
(manuscript received 28 Mar 86) pp 134-136

[Article by S. M. Landau, L. K. Sasina, N. A. Chashchin and L. I. Chashchina, Institute of Molecular Biology and Genetics, Ukrainian SSR Academy of Sciences, Kiev]

[Abstract] An analysis was conducted on the induction of replication of recombinant pBR325 plasmid (pBR322 congeners bearing complete SV40 genome) in a permissive system represented by simian CV1 cells. Recombinant plasmids bearing one or two SV40 genomes failed to replicate, due to the presence of 'poison sequences' in the pBR322 genome. However, infection of the cells with a combination of the recombinant plasmids and the SV40 virus led to concomitant replication of SV40 as well as of the recombinant plasmids. The presumed mechanism involved the binding of the SV40 T-antigen to the SV40 origin of the recombinant plasmid, thus favoring their replication. These findings demonstrate that the SV40 virus may be used to induce replication of bacterial plasmids bearing the SV40 genome in mammalian cells. Figures 1; references 6: 2 Russian, 4 Western.

12172/5915
CSO: 1840/980

REPLICATION OF RECOMBINANT DNA IN TOBACCO PROTOPLASTS

Kiev BIOPOLIMERY I KLETKA in Russian Vol 3, No 3, May-Jun 87
(manuscript received 13 Aug 85) pp 145-148

[Article by V. A. Kordyum, V. A. Trukhanov, Ye. K. Toporova, V. N. Shulzhenko and T. N. Checheneva, Institute of Molecular Biology and Genetics, Ukrainian SSR Academy of Sciences, Kiev]

[Abstract] An otherwise-undefined replicative vector was constructed for use in mesophilic tobacco protoplasts, that represented a combination of previously defined vectors and genomic elements of higher plants. The vector in question had a MW of 4.6×10^6 Da. Its DNA electrophoretograms and autoradiograms were compared with the patterns obtained for pBR322 in protoplast lysates, demonstrating that the novel vector underwent replication. Figures 3; references: 12 Western.

12172/5915
CSO: 1840/980

UDC 577.214.622

HIGH STABILITY OF RECOMBINANT FILAMENTOUS M13 PHAGE BEARING E. COLI rpoBC OPERON

Kiev BIOPOLIMERY I KLETKA in Russian Vol 3, No 4, Jul-Aug 87
(manuscript received 29 Jan 87) pp 221-223

[Article by A. N. Zhivolup and Ye. B. Paton, Institute of Molecular Biology and Genetics, Ukrainian SSR Academy of Sciences, Kiev]

[Abstract] Highly stable recombinant M13 phages bearing E. coli rpoBC operon were constructed by removal of the lac promoter from M13mp8 with AvaI restriction enzyme, and subsequent cloning of the E. coli DNA fragment into the phage DNA. The result consisted of 15 recombinant bacteriophages with electrophoretic studies revealing 5.25×10^6 and 3.68×10^6 DNA fragments, indicating unidirectional insertion of the E. coli fragment. Antibiotic resistance studies demonstrated the high stability (ca. 99%) of the recombinant phages. Figures 2; references 11: 3 Russian, 8 Western.

12172/5915
CSO: 1840/980

UDC 615.849.19.03:617.7-006

USE OF VARIOUS LASERS IN ONCOLOGIC OPHTHALMOLOGY

Moscow VESTNIK OFTALMOLOGII in Russian Vol 103, No 4, Jul-Aug 87
(manuscript received 10 Feb 87) pp 33-37

[Article by V. V. Volkov, professor, L. I. Balashevich and A. F. Gatsu, candidates of medical sciences, Yu. D. Berezin, candidate of biological sciences, Ya. L. Kulakov, P. S. Avdeyev and V. V. Lazo, Leningrad]

[Abstract] A cursory review is presented on the use of several lasers in the management of tumors of the eye and adnexa oculi, based on one to eight-year follow-up of 181 cases. The lasers employed included primarily yttrium-erbium, neodymium, argon, and combination of different laser emissions with Q switching. On the basis of the equipment available and the clinical results, it became obvious that Soviet ophthalmic lasers require further development. In particular, the flexibility of Nd-based lasers would offer many advantages in terms of a range of beam energies and a choice of wavelengths suitable for a wide range of applications. In addition, the Nd-YAG laser should be supplemented by more advanced CO₂ lasers for excision of superficial and retrobulbar tumors, as well as for intraocular applications. Figures 5; references 16: 11 Russian, 5 Western.

12172/5915
CSO: 1840/979

UDC 547.063.32

DNA MODIFICATION AND RESTRICTION SYSTEMS IN AGROBACTERIA

Kiev BIOPOLIMERY I KLETKA in Russian Vol 3, No 3, May-Jun 87
(manuscript received 21 Apr 86) pp 128-131

[Article by T. V. Stefanishina, I. G. Bogdarina and Ya. I. Buryanov,
Institute of Molecular Biology and Genetics, Ukrainian SSR Academy of
Sciences, Kiev; Institute of Biochemistry and Physiology of Microorganisms,
USSR Academy of Sciences, Pushchino]

[Abstract] An analysis was conducted on the modification and restriction characteristics of 19 strains of Agrobacterium, both virulent strains, with Ti plasmids, and cured strains. The DNA from every strain tested was insusceptible to digestion by EcoRII. However, DNA methylases possessing the specificity of R X EcoRII were detected, as well as the corresponding restriction endonuclease. The fact that both plasmid-bearing and cured strains contained this modification and restriction system underlined the chromosomal nature of this trait. Figures 3; references: 4 Western.

12172/5915
CSO: 1840/975

UDC 582.282.23.017.7:546.59

ACCUMULATION OF GOLD BY CANDIDA UTILIS

Moscow MIKROBIOLOGIYA in Russian Vol 56, No 2, Mar-Apr 87
(manuscript received 29 Oct 85) pp 209-216

[Article by V. I. Biryuzova, Ye. D. Korobushkina, I. N. Pozmogova and G. I. Karavayko, Institute of Microbiology, USSR Academy of Sciences, Moscow; Scientific Research Institute of Biology, Irkutsk]

[Abstract] A cytologic and ultrastructural study was conducted on the accumulation of metallic Au(0) and ionic Au(III) gold by Candida utilis Y-1668 from a synthetic growth medium supplemented with ethanol. In both cases (75 mg/liter Au(0); 6.3 and 25.3 mg/liter Au(III) maximum accumulation had occurred by 6 h, with the uptake rate of Au(III) exceeding that of Au(0).

Gold was deposited in virtually all of the organoids, with the exception of mitochondria. The effects of gold on growth processes were indicated by the presence of large numbers of giant cells. Coagulation was evident in dead cells, with reduced forms of gold readily recovered by mechanical disruption of the cells. The uptake process appeared to involve initial electrostatic interaction between gold and the capsule, followed by accumulation of the gold in the capsule and the cell wall. Subsequent steps involved translocation across the cell wall and transport into the periplasmic space via yet-undefined enzymatic mechanisms. Uptake into the cytoplasm and organoids evidently proceeds by pinocytosis. Figures 3; references 11: 8 Russian, 3 Western.

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UDC 582.288-11

TOXIGENIC POTENTIAL OF SELECTED GROUP B TRICHOPECENE-PRODUCING FUSARIUM SPECIES

Kiev MIKROBIOLOGICHESKIY ZHURNAL in Russian Vol 49, No 3, May-Jun 87
(manuscript received 31 Mar 86) pp 49-55

[Article by V. A. Tutelyan, V. I. Bilay, K. I. Eller, E. V. Boltyanskaya, V. S. Sobolev, I. A. Ellanskaya and A. G. Sarafanov, Institute of Nutrition, USSR Academy of Medical Sciences, Moscow; Institute of Microbiology and Virology, Ukrainian SSR Academy of Sciences, Moscow]

[Abstract] A systematic evaluation was conducted on the toxigenic potential of 62 strains of the microscopic fungus *Fusarium*, isolated from various food-stuffs in the USSR. The data demonstrated that 21% of the strains produced deoxynivalenol, in concentrations ranging from 0.2 to 106.2 $\mu\text{g}/\text{kg}$, while 27.4% produced zearalone (0.1-75.8 $\mu\text{g}/\text{kg}$). In 50% of the cases simultaneous production of both toxins was detected by TLC and HPLC. Toxin production was a feature only of *F. culmorum* and *F. graminearum*. None of the strains produced nivalenol or fusarenone. Figures 2; references 7: 2 Russian, 5 Western.

12172/5915
CSO: 1840/976

EFFECTS OF FODDER TEMPERATURE AND MOISTURE ON GROWTH OF ASPERGILLUS
FUMIGATUS AND GLIOTOXIN PRODUCTION

Kiev MIKROBIOLOGICHESKIY ZHURNAL in Russian Vol 49, No 3, May-Jun 87
(manuscript received 20 May 86) pp 62-65

[Article by Z. A. Kurbatskaya and A. A. Trostanetskiy, Institute of Microbiology and Virology, Ukrainian SSR Academy of Sciences, Kiev]

[Abstract] The growth of *Aspergillus fumigatus* and production of gliotoxin were studied in relation to temperature and moisture of a variety of fodder substrates (hay, soya millet, oats, wheat, barley, bean, etc.) Various degrees of growth were obtained on the various fodder products, with the exception of straw on which no growth occurred. Highest levels of gliotoxin were found on hay (10.0 mg/kg by day 4) and on oats (7.1 mg/kg on day 9). Temperatures of 30-36°C and a humidity of more than 30% promoted high levels of gliotoxin synthesis. At 22 and 42°C gliotoxin production was attenuated, and failed to occur at humidities below 30%. Consequently, harvesting and grain storage should be conducted under conditions limiting humidity to 15-18% with temperatures at 20°C or lower. Figures 2; tables 1; references 15: 1 Ukrainian, 10 Russian, 4 Western.

12172/5915
CSO: 1840/976

INHIBITION OF MICROMYCETE GROWTH ON OPTICAL GLASS PROTECTED BY HALOGENATED
ORGANOSILICON FILM

Kiev MIKROBIOLOGICHESKIY ZHURNAL in Russian Vol 49, No 4, Jul-Aug 87
(manuscript received 10 Oct 85) pp 51-54

[Article by V. A. Sviderskiy, E. Z. Koval, I. V. Arshinnikov and P. S. Borsuk, Kiev Polytechnic Institute; Institute of Microbiology and Virology, Ukrainian SSR Academy of Sciences, Kiev]

[Abstract] Studies were conducted on the protection, from growth by micro-mycetes, of optical glass coated with a thin-film, halogenated, organosilicon compound. Optimal growth inhibition of *Aspergillus flavus*, *A. niger*, *A. penicilloides*, *A. terreus*, and *A. versicolor* was obtained with films prepared from trifunctional halomethyl acetoxysilanes. In comparison with bifunctional congeners the wetting angle was increased to 85-93°, with 60-80% filling. Tables 1; references 16: 14 Russian, 2 Western.

12172/5915
CSO: 1840/976

UDC 578.245:578.54:577.213.3

ANTIVIRAL EFFECT OF MUTANT INTERFERONS. NEW APPROACH TO STUDYING
STRUCTURAL-FUNCTIONAL ORGANIZATION OF INTERFERONS

Moscow BIOORGANICHESKAYA KHIMIYA in Russian Vol 13, No 2, Feb 87
(manuscript received 25 Jun 86) pp 259-262

[Article by V. A. Petrenko, S. I. Tatkov, G. F. Sivolobova, A. N. Boldyrev,
A. A. Kolokoltsov, A. M. Yeroshkin and V. A. Kulichkov, All-Union Scientific
Research Institute of Molecular Biology, Koltsov, Novosibirsk]

[Abstract] Data are presented from the final stages of an investigation of the biological properties of mutant interferons. The major stages of the study included: cloning of the human $\alpha 2$ -interferon gene in a suitable vector based on phage M13 DNA; fusion of the interferon gene with an α -peptide gene to produce easily testable interferon derivatives; production of mutant interferon genes by local mutagenesis; determination of the antiviral activity of the mutant interferons; analysis of the primary structure of the mutant interferon genes; and correlation of the antiviral activity of the interferons with their structure. The antiviral activity was determined of ten human leukocytic $\alpha 2$ -interferon analogs differing from the natural protein by replacement of up to 15 amino acid groups. The approach used allows investigation of a broad range of interferon variants, correlating their biological properties with the protein structure. Figures 2, references 13: 6 Russian, 7 Western.

6508/5915
CSO: 1840/957

UDC 577.213.7

PLASMID EXPRESSIVE VECTORS BASED ON ESCHERICHIA COLI β -GALACTOSIDASE GENE
FRAGMENTS

Moscow BIOORGANICHESKAYA KHIMIYA in Russian Vol 13, No 3, Mar 87
(manuscript received 24 Jun 86) pp 350-358

[Article by O. G. Chakhmakhcheva, O. V. Mirskikh, Chong Nam Khay and
V. A. Yefimov, Institute of Bioorganic Chemistry, imeni M. M. Shemyakin,
USSR Academy of Sciences, Moscow]

[Abstract] Continuing earlier studies on the production of plasmid and phage vectors convenient for cloning and expression of genes, the authors constructed

a number of expressive plasmid vectors. This article describes the method of producing some of these plasmids, used to obtain E coli β -galactosidase gene fragments, and studies the effectiveness of their functioning in expression of the gene for the functionally important bacterioopsin fragment. The new plasmid vectors, which achieve a high level of expression in bacterial cells, were constructed using synthetic oligonucleotides. The yield of hybrids was 5-30% of the total quantity of protein in the cell. The length of the leader sequence of hybrid protein was found to influence the level of expression of the end product peptide. The shorter the leader, the greater the yield of the end product peptide per gram of biomass. Figures 6; references 23: 6 Russian, 17 Western.

6508/5915
CSO: 1840/957

UDC 577.133.5/6

NEW PRIMER FOR SEQUENCING DNA FRAGMENTS CLONED INTO M13mp VECTORS

Moscow BIOORGANICHESKAYA KHIMIYA in Russian Vol 13, No 4, Apr 87
(manuscript received 31 Jul 86) pp 556-558

[Article by A. N. Boldyrev, A. N. Sinyakov and V. A. Petrenko, All-Union Scientific Research Institute of Molecular Biology, Koltsovo, Novosibirsk]

[Abstract] M13mp series vectors, derivatives of the DNA of the phage M13, are widely used in DNA sequencing studies, investigation of the specificity of action of mutagens, localized mutagenesis and determination of the mechanism of induced mutagenesis. Primers are required for sequencing which are separated from the polylinker area of the DNA by more than the 17-link primer normally used for this purpose. The authors searched for, then synthesized a new universal primer suitable for sequencing cloned genes. In selecting an oligonucleotide as the primer, two criteria were followed: The oligonucleotide must contain a restriction endonuclease site at its 5' end; the melting point of the matrix-primer hybrid complex must be higher than the melting point of other hybrids which can be formed due to presence of the same restriction site in the vector in other positions. Figures 2; references 16: 8 Russian, 8 Western.

6508/5915
CSO: 1840/957

MOLECULAR CLONING OF GENES CODING TUMOR NECROSIS FACTORS. COMPLETE
NUCLEOTIDE SEQUENCE OF TNF- α GENOME COPY IN MICE

Moscow BIOORGANICHESKAYA KHIMIYA in Russian Vol 13, No 5, May 87
(manuscript received 18 Oct 86) pp 701-705

[Article by A. N. Shakhov and S. A. Nedospasov, Institute of Molecular Biology,
USSR Academy of Sciences, Moscow]

[Abstract] Tumor necrosis factors are protein immunomodulators with broad biological action spectrum, including antitumor effects both in vivo and in vitro. In contrast to interferons, tumor necrosis factors (TNF) have little species specificity, since human, mouse and rabbit TNF are active in heterologous systems. This article presents the results of determination of the nucleotide sequence and exon-intron structure of the mouse TNF gene. The structure agrees well with DNA sequences determined earlier by Fransen et al. Figures 2; references: 11 Western.

6508/5915

CSO: 1840/957

UDC 577.352.38:577.115

OPPOSITE EFFECT OF LOW AND HIGH DOSES OF AMISILE, m-CHOLINOLYTIC AGENT ON
COMPOSITION AND ANTIOXIDATIVE ACTIVITY OF SYNAPTOSOMAL MEMBRANE LIPIDS

Moscow BIOLOGICHESKIYE MEMBRANY in Russian Vol 4, No 2, Feb 87
(manuscript received 11 Jun 86) pp 165-170

[Article by Ye. B. Burlakova, G. V. Arkhipova and L. P. Chernyavskaya,
Institute of Chemical Physics, USSR Academy of Sciences, Moscow]

[Abstract] Phospholipids play an important role in transmission of nerve impulses. Administration of antioxidants alters sensitivity of cholinoreceptors to the action of the cholinomimetic arecoline. The effect of m-cholinolytics is dose-related, possibly due to changes in lipid membrane composition. Therefore, it was of interest to examine the effect of atropine, amisile and arecoline on the composition of synaptosomal membrane lipids. It was shown that amisile leads to altered lipid content and antioxidative activity in 15 minutes and at 1 hour after administration. Amisile, at doses of 0.1 or 10 mg/kg, leads to opposite changes in phospholipid fractions which return to normal after 4 hours. An assumption was expressed that there are two routes by which lipid content is altered after administration of amisile: a direct influence on lipid component of the membrane and an indirect one by which amisile is bound to cholinoreceptor followed by structural and compositional changes in the membrane. Figures 1; references 15: 11 Russian (2 by Western authors), 4 Western (1 by Russian authors).

7813/5915
CSO: 1840/948

EFFECT OF PINK FUSARIOSE AND NONFUSARIOSE GRAIN EXTRACTS ON ORGAN
STRUCTURES ON GROWING RATS

Moscow VOPROSY PITANIYA in Russian No 3, May-Jun 87
(manuscript received 8 Mar 86) pp 58-62

[Article by I. B. Kuvayeva, N. P. Sygonyaeva, E. V. Boltyanskaya, L. A.
Khvylya and G. V. Kameneva, Institute of Nutrition, USSR Academy of Medical
Sciences, Moscow]

[Abstract] During a wet summer season, farmers sometimes notice grains with pink color rising when grains are damaged by fungus of the genus *Fusarium*, some representatives of which produce mycotoxins. This article studies the toxic effect of pink fusariose and non-fusariose grains by analyzing morphologic changes in the internal organs of rats exposed to doses not causing irreversible pathologic changes. Extracts from the pink grains, both with and without signs of fusariosis, caused similar changes in the morphologic structure of the organs, indicating that the pink grains are toxic. Toxicity increased with increasing number of pink grains in a sample. If the content of such grains was over 7.5%, they had an unfavorable effect on the rats, causing damage to the structure of parenchymatous organs and immune system organs. At 3.5% content of pink grains, the toxic effect was slight, though changes were observed in a number of organs at the structural and cellular level, indicating regional antigen irritation. Figures 5; references 17: 13 Russian, 4 Western.

6508/5915
CSO: 1840/931

UDC 612.821.3-06:[612.822.2:577.112.4]

OLIGOPEPTIDES IN BEHAVIORAL ORGANIZATION BASED ON SELF-EXCITATION OF
BRAIN STRUCTURES

Moscow VESTNIK AKADEMII MEDITSINSKIKH NAUK SSSR in Russian No 6, Jun 87
(manuscript received 26 Dec 86) pp 6-10

[Article by K.V. Sudakov, Scientific Research Institute of Normal Physiology
imeni P.K. Anokhin, USSR Academy of Medical Sciences, Moscow:
"Oligopeptides in Behavioral Organization Based on Self-Excitation of Brain
Structures"] .

[Text] Among the various behavioral forms in animals, a special place is
occupied by behaviors formed on the basis of self-excitation of emotiogenic
brain structures. The self-excitation behaviors have all the traits of an
independent functional system [1] which produces as a result of its activity
a specific positive emotional state of an animal, arising upon excitation of
brain structures [6, 7].

It has been established that self-excitation behavior is constructed
according to the self-regulation principle. Given the appropriate
conditions, animals select on their own the intensity and rhythm of
self-excitation [5].

The nature of self-excitation behavior has remained largely unclear until
now. It has been established with certainty that when an electrode is
implanted into certain, usually limbicoreticular, brain structures the
animals persistently strive to close an electric circuit, even surmounting
complex obstacles, thus providing self-induced excitation to these brain
structures [3, 15, 8, 27].

Without going into the nature of self-excitation behavior, two points should
be made: 1) self-excitation is constructed on the basis of ascending
activating effects of emotiogenic zones of the brain on other brain
structures, including the cortex [3, 15]; and 2) oligopeptides play a
significant role in the functioning of emotiogenic zones of self-excitation,
especially in the hypothalamic region [10, 22, 25].

This may suggest that the reinforcing action of self-excitation is determined less by the electric stimulation of the emotiogenic brain structures as such than by the secretion of endogenous oligopeptides at the stimulation site and their secondary effect on the various brain structures.

In order to test this hypothesis, a special investigation was staged. In one series, self-excitation behavior was studied with additional introduction of oligopeptides into the body, specifically into lateral ventricles of the brain; by contrast, in the other series the process of expression by oligopeptide genes was blocked in animals by introducing protein synthesis blockers and studying self-excitation behavior against this background.

Self-Excitation Behavior With Additional Introduction of Oligopeptides Into the Body of the Animal

The experiments of this series were done on rabbits and rats.

Bipolar nickel-chrome alloy electrodes were implanted into the region of the lateral hypothalamic field. The electrode tip diameter was 0.12 mm. The electrodes were fixed at those points of the lateral hypothalamus in which an electric stimulus caused self-excitation behavior in the animals: the rabbits tried to touch a metal object with their nose or lips, thus closing the circuit of electric current stimulating their brain. The stimulation parameters were: current 40-60 μ A; length of pulse 0.3 ms; total length of stimulation 0.3 s.

Oligopeptides were administered to rabbits with a microinjection syringe in one of the lateral ventricles of the brain through an implanted cannula of a diameter of 0.8 mm. In the experiments on rabbits, self-excitation behavior was studied with the following oligopeptides introduced into lateral ventricles of the brain: angiotensin-II, argininevasopressin, bradykinin, peptide causing delta-sleep (PCDS), β -endorphin, cholecystokinin, Leu- and Met-enkephalins, ACTH₄₋₁₀ and ACTH₇₋₁₁.

In rats self-excitation was produced by electric stimulation through implanted nickel-chrome alloy electrodes in various hypothalamic sections. The excitation parameters were: voltage 2-3.5 V; duration of each pulse 0.5 ms; total length of stimulation 0.5 s.

Self-excitation behavior in rats was studied after intraabdominal injection of an ACTH fragment (ACTH₅₋₈) and β -MSH₅₋₈.

The experiments showed that the oligopeptides studied by us, when introduced additionally into the lateral ventricles of the brain in rabbits and rats, had a blocking effect on self-excitation behavior after 15-20 min (fig. 1). The optimal doses of the inhibition action of oligopeptides have been determined (see table 1). It was observed that, against the background of inhibition of self-excitation by angiotensin-II, drinking response was stimulated in rabbits, while bradykinin produced defensive reactions. Against the background of Met-enkephalin and ACTH₇₋₁₁, the animals exhibited

Table 1. Effect of Oligopeptides on the Self-Excitation Behavior in Animals Induced by Electric Hypothalamic Stimulation

Item	Angio- tensin-II	Arginine- vasopressin	PSDS	Bradykinin	Leu- enkephalin	Met- enkephalin	β -endor- phin	ACTH 7-11	ACTH 5-8
Object of investi- gation, number	Rabbits 24	Rabbits 16	Rabbits 22	Rabbits 24	Rabbits 6	Rabbits 21	Rabbits 3	Rabbits 6	Rabbits 24
Method of admin- istration	iv	iv	iv	iv	iv	iv	iv	iv	iv, ia
Dose, μ g	0.05- 0.15	0.05- 0.15	0.05- 0.15	0.05- 0.15	0.15	0.1- 10.1	0.15	0.1- 0.5	50-100 ng
Effect	Inhibi- tory, causes drinking reaction	Inhibi- tory	Inhibi- tory	Inhibi- tory, causes avoidance reactions	Inhibi- tory	Inhibitory, causes grooming	Inhibi- tory	Inhibi- tory, causes grooming	Acti- vating

Note. iv = intraventricular administration; ia = intraabdominal administration.

grooming reactions. The inhibitory action of oligopeptides continued for up to 1 day.

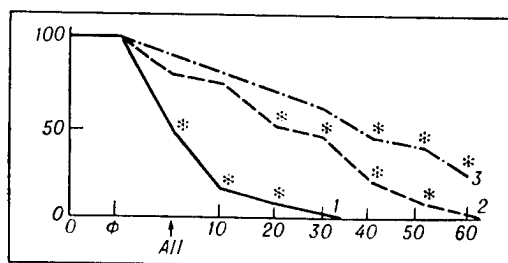


Figure 1. Dosage-dependent blocking action of angiotensin-II introduced into lateral ventricles of the brain upon self-excitation frequency in rabbits with direct electrical stimulation of lateral hypothalamus: AII = time of introduction of angiotensin-II in doses 0.15 µg (1), 0.05 µg (2), and 0.015 µg (3); number of animals = 19; asterisks indicate the results with $p < 0.05$; here and in fig. 3, self-excitation frequency (percentage of baseline, Φ) is plotted on the ordinate; time (min) is plotted on the abscissa.

As shown by L.V. Likhacheva [14], the inhibitory effect of Met-enkephalin on self-excitation behavior in rabbits was not observed after destruction of the ventromedial nucleus or medial part of the lateral hypothalamus. All this is evidence that the blocking effect of Met-enkephalin on self-excitation behavior is mediated through its effect on the receptors of these portions of the hypothalamic region.

In special experiments [11, 17, 20] it has been shown that angiotensin-II and PCDS, when injected into lateral ventricles of the brain, cause pronounced change of cortical-subcortical relationships in the animal. The ascending activating effect of reticular formation of the brain stem upon the cortex is blocked. Microionophoretic behavior of these oligopeptides with respect to the individual neurons of the cortex and subcortical formations greatly modifies their sensitivity to hypothalamic stimulation and neuromediators [12, 23]. Against the background of PCDS action, a blocking of cyclase mechanisms in hypothalamic neurons and the reticular formation of the midbrain was observed [13].

These results indicate that when oligopeptides are introduced additionally into the body, especially into the lateral ventricles of the brain, self-excitation would occur against the background of modified brain properties: changed cortical-subcortical relations and altered sensitivity of cerebral neurons to afferent messages and neuromediators. Most of the oligopeptides studied by us apparently occupy, either independently or through chains of cascade metabolic reactions they trigger, the receptors of natural ligands

which define self-excitation behavior. This explains the inhibition of self-excitation behavior after electric stimulation of hypothalamic structures.

Special experiments have shown that self-excitation is significantly modified when the properties of the brain are changed by various experimental procedures. For example, the intensity of self-excitation was changed in rabbits after their immobilization [2] and in rats after denervation of the aortic arc and carotid sinuses [16]. It should not be ruled out either that upon additional introduction of oligopeptides into the lateral ventricles of the brain, molecular dominance of a certain biological tendency is activated, such as drinking, copulative or defensive reactions, which inhibit self-excitation behavior.

It has been determined that oligopeptide action largely depends on the method of their administration, the stimulation site and the original intensity of self-excitation. For example, subcutaneous administration of ACTH₄₋₉ fragment increased the frequency of self-excitation of the medial fascicle of the forebrain [26]. A similar reaction was produced by ACTH₄₋₁₀ [24]. Intraabdominal injection of ACTH₅₋₁₀ suppressed the intensity of self-excitation reactions of the lateral hypothalamus [4].

Experiments by our staff [9] were conducted to investigate self-excitation behavior after introduction of the ACTH₅₋₈ fragment and β -MSH₅₋₈, injected intraabdominally in doses of 40 and 20 ng, respectively, per 100 g body weight. After the administration of oligopeptide, self-excitation behavior was recorded during 4-6 hr every 30 min in spans of 5 min. The tests were performed on each rat two to three times every 6 to 8 days.

The behavior of rats has been studied with electric stimulation of the anterior hypothalamic field, lateral hypothalamic field, the arch and the mammillothalamic tract.

As early as 15 min after ACTH₅₋₈ administration, exploratory activity increased in the animals, and the intensity of self-excitation was raised. In 3 of 5 rats two phases could be distinguished in the increase of self-excitation intensity, at 0.5-1 and 4.5-6 hr. In the interval between these periods, the frequency of self-excitation declined to almost the initial level (fig. 2). β -MSH₅₋₈ did not affect self-excitation behavior to any noticeable degree.

Remarkably, when ACTH₅₋₈ was injected into lateral ventricles of the brain in rabbits, self-excitation behavior was inhibited. It is possible that oligopeptides introduced into the lateral ventricles of the brain inhibit self-excitation behavior according to the feedback principle as their concentration gradually rises.

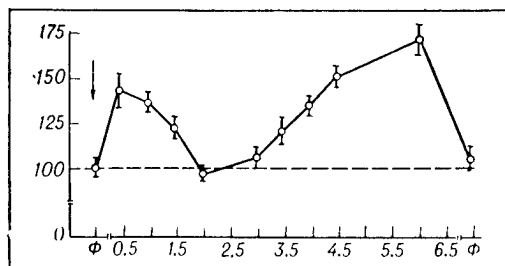


Figure 2. Self-excitation behavior in rats against the background of ACTH₅₋₈. The ordinate plots the self-excitation as a percentage of baseline (Φ), taken for 100%; the abscissa plots the time of the experiment (hours). The arrow indicates the point of ACTH₅₋₈ injection.

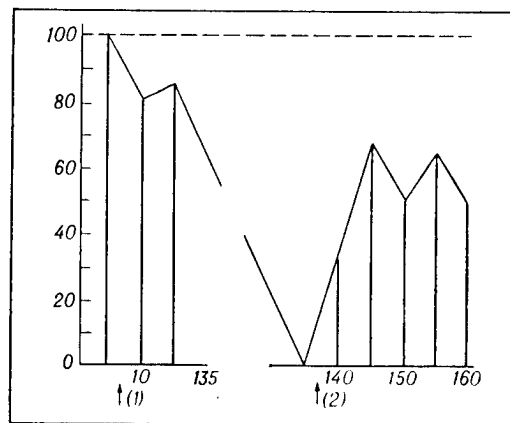


Figure 3. Blocking of self-excitation behavior after injection of cyclohexamide into lateral ventricle of rabbit brain and recovery of self-excitation after injection of ACTH₄₋₁₀. Arrows indicate the injection of cyclohexamide (1) and ACTH₄₋₁₀ (2).

Self-Excitation Behavior With Blocking of Genetic Mechanisms of Oligopeptide Expression

Members of the research staff of our institute, R.A. Burchuladze, Yu.N. Samko and R.S. Saliyeva, studied self-excitation behavior of rabbits after the introduction of a blocker disrupting the matrix DNA function (actinomycin D) and a blocker of the translation stage (cyclohexamide). These substances were injected into lateral ventricles of the brain in doses determined on the basis of the data of [19]: actinomycin D, 0.04-0.4 $\mu\text{g}/\text{kg}$; cyclohexamide 15-30 $\mu\text{g}/\text{kg}$ body weight.

The experiments showed that both substances, when injected into the lateral ventricles of the brain, within 30-120 min completely blocked self-excitation behavior of rabbits for a day or more (fig. 3). Introduction into lateral

ventricles against the background of pentagastrin protein synthesis blockers, Met- and Leu-enkephalin and cholecystokinin in an amount of 100 ng per kg body weight did not produce a recovery of self-excitation behavior.

Self-excitation behavior in rabbits was partially recovered when, against the cyclohexamide background, ACTH₄₋₁₀ was injected into the lateral ventricles in a dose of 30 µg/kg.

Our experiments suggest the following conclusion.

Excitations arising when subcortical emotiogenic brain structures are stimulated are addressed to the genetic apparatus of nerve cells. This leads to an expression by the genes of special oligopeptides which organize self-excitation behavior. The mechanism of organization of self-excitation in behavior is different from the molecular mechanism realizing the food motivation, which arises when the lateral hypothalamus is stimulated electrically. Experiments by S.K. Sudakov [19] have shown that the alimentary behavior in rabbits during electric stimulation of the "hunger center" of the lateral hypothalamus when blocked with cyclohexamide is recovered after pentagastrin is introduced into lateral ventricles of the brain; for self-excitation behavior pentagastrin was ineffective. These data point to the specific characteristics of the expression by genes of oligopeptides in biological motivations of various biological qualities.

The study has shown that an additional introduction into the lateral ventricles of the rabbit brain of angiotensin-II, arginine-vasopressin, bradykinin, PCDS, Leu- and Met-enkephalins, β-endorphin, cholecystokinin and ACTH₇₋₁₀ blocks self-excitation behavior in animals. Conversely, when antiserum to PCDS is injected, the behavior of self-excitation of the lateral hypothalamus is facilitated in rabbits [21]. Self-excitation behavior was activated by additional injection of ACTH₅₋₈.

These results show that, along with oligopeptides which inhibit self-excitation behavior, there exist oligopeptides which stimulate it. Obviously, we do not claim that mechanisms exhaust the complex process of systemic organization of a behavioral act on an emotional basis. Certainly, in this complex process there still remain a large number of obscure aspects of oligopeptide activity: their role in the transmission of excitations from hypothalamic emotiogenic centers to other brain neurons, including the cortex, the processing of genes, the inverse influence on the emotiogenic centers of the hypothalamus, etc.

Nevertheless, our data indicate the possibility of reconstructing biological motivations with blocking of protein synthesis processes achieved by injecting specific oligopeptides into the brain; we believe that this opens new prospects for directed correction of brain functions and especially behaviors built on an emotional basis.

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POOR QUALITY MEDICAL INSTRUMENTS

18400939b Moscow EKONOMICHESKAYA GAZETA in Russian No 33, Aug 87 p 8

[Article by Ye. Babak: "Severe Diagnosis--Development of New Instruments Is Worse Than the Old"; first two paragraphs are introduction]

[Text] The abundance of mail concerning the phonocardiograph--the medical instrument which the plant manufactures--surprised B. Zhuravlev during his first days of work as manager of Gospriyemka [State acceptance] at the Moscow Plant Ritm. Letters are coming in even now--from all parts of the country--from medical workers of Leningrad and Amur oblasts, of Krasnodar and Krasnoyarsk krays.

Alas, it is difficult to find words of thanks in this mail. The meaning of the letters is unanimous: the expensive equipment does not operate. Moscow physicians have appealed directly to Gospriyemka with complaints about the poor quality of the instrument.

Everyone knows what an electrocardiogram is. The phonocardiogram (a graphical recording of the work of the heart) is made during more extensive examination of it. The phonocardiograph detects the noise which the physician is unable to hear.

"But the phonocardiograph manufactured by the Ritm Plant for some reason 'hears' worse than I do myself," remarks D. Mikhlin, a physician of Moscow Polyclinic No. 164, without embarrassment. "It is useless to us."

We shall omit a detailed description of the deficiencies of the phonocardiograph, understandable only by specialists. The polyclinic physicians have repeatedly sent their complaints to the plant. Adjusters from the plant came to the polyclinic. They determined that the electronic part of the instrument was malfunctioning. But as before, the instrument does not hear what is occurring in the patient's heart. It remains part of the interior--nothing more--at the polyclinic.

Incidentally, serial manufacture of the instrument is continuing. Moreover, workers at the All-Union Institute of Medical Instrument Building (VNIIMP),

within the walls of which the instrument was born, are in no way in agreement with such a sharp evaluation of their child. They talk lightly about its individual deficiencies.

Distraught medics ask in one of the letters: was the instrument tested at all?

Of course it was tested. Experimental models of the phonocardiograph were tested in the three leading clinics of the capital. Specialists of all three clinics recommended the instrument for serial manufacture, provided that the deficiencies (rather numerous deficiencies) which they noted were corrected. Minzdrav SSSR [USSR Ministry of Health], in approving the new product, did not impose any conditions on the institute. Either they considered the comments insignificant or it is obvious that VNIIMP decided that the deficiencies would be corrected initially.

However, it turned out differently. The phonocardiograph initially began to be manufactured serially and then to be modified. According to data of the enterprise, more than 1,000 changes were introduced in the design documentation over 3 years. But even now many remarks of physicians repeat verbatim the remarks of medics that were made during clinical trials.

The Committee of the Moscow Standardization Center, which checked the enterprise at the beginning of the year, tried to determine the extent of deficiencies of the institute and plant, but retreated under an avalanche of mutual recriminations. The errors of designers were easily explained by disorders at the plant. The plant's sins were no less conveniently hidden by the errors of the designers.

Is it not amazing that the plant was able to live without special commotion before introduction of Gospriyemka? Last year, it received tens of complaints, while four complaints figured in the annual report. Analysis of specialists of the Moscow Standardization Center showed that in fact 30 percent of the instruments manufactured by the plant are not operating.

Both production and technological discipline were tightened upon arrival of State acceptance at the enterprise. Order was brought into accounting for complaints. Input control was intensified. In turn, the plant began to make complaints against unfair partners (they earlier tolerated the fact that there was no great need for this).

"And even so it is impossible to unravel such firmly knotted problems only through bringing order to the plant," says the manager of Gospriyemka B. Zhuravlev. "We must begin from the beginning with elimination of design deficiencies. And Gospriyemka is not coping with this alone."

The Committee on Clinical-Diagnostic Instruments and Apparatus of the USSR Ministry of Health decides the fate of the medical equipment. All materials of Gospriyemka at the Ritm Plant are also transmitted there.

The decision of the committee is similar to a hopeless diagnosis of a patient. The instrument is structurally deficient. The plant is incapable of guaranteeing either the quality or reliability of its manufacture. The committee recommends that output of it be stopped until VNIIMP brings the instrument up to the appropriate level or replaces it with a new model.

And again one must praise the persistence and basic principles of the State controllers of the Ritm Plant, who knew how to block the path of poor work. However, it is premature to do this: the committee has postponed its decision for 7 weeks.

Why is this, were incorrect conclusions made at the first meeting?

"No, we learned that the instrument has been modified for a number of parameters," evasively says the chief of administration of the USSR Ministry of Health Yu. Bobkov.

The chief engineer of the plant, V. Gorshkov, shuffles his papers and recalculates what has been done: the certificate of the instrument has been refined and the technical conditions and card of the technical level are being corrected.

"If only the phonocardiograph was improved due to these paper corrections," it is said sadly at Gospriyemka.

But they believed in the force of paper corrections at USSR Gosstandart and decided not to go into the sins of design. A written decree arrived from USSR Gosstandart: once manufacture of the instrument is renewed, Gospriyemka is obligated to accept it if it corresponds to specifications and if measures to improve its quality are carried out. But it almost always corresponds to specifications of some kind.

Incidentally, the committee of the Ministry of Health decided to manufacture the instrument only until the end of this year. At the end of the year, it plans to familiarize itself with the comments of medical institutions on the quality of products manufactured during the second 6 months.

The first comment has already arrived--from Vladimir: they simply returned the instrument. It does not operate, although it corresponds to specifications and fully "sensed" the measures to improve its quality.

Instruments that passed Gospriyemka were received at Barnaul.

"They still do not operate," says the chief of the technical department of the Barnaul Medical Equipment Plant M. Likhachev. "A total of 56 phonocardiographs has arrived at Altayskiy Kray. Almost all are inoperative. Has anyone thought of what to do with them now?"

But the Ministry of Health still plans to increase its order this year 2.5-fold so as to reduce the shortage of the instruments.

Because the phonocardiograph is a real "shortage." The demand for it is high. But its dependability! And now the long-suffering child of VNIIMP and of the Ritm Plant is the only Soviet model. Do not the Altay physicians, having 50 inoperative instruments at their disposal, really feel a shortage?

Modifications during serial manufacture of the instrument cost the State dearly. The product itself costs 5,500 rubles. Scarce parts, needed very much for manufacture of other electronic equipment, are expended on it. The plant adjusters are constantly traveling throughout the country--from Leningrad to Amur--on summonses of medics. Naturally, they travel on State funds. The highly paid colleagues of VNIIMP are incessantly diverted to routine "improvements." Finally, they quietly receive both wages and bonuses at the Ritm Plant for a low-quality product.

The Gospriyemka of the plant has essentially become discredited in the eyes of the medics. The Gospriyemka workers themselves admit: they write directly: "The product is accepted but we do not guarantee its quality."

The Krasnodar MEDTEKHNIKA requested in its letter that the address of some medical institution be given where the phonocardiograph is operating reliably so one can travel there to look at it and study it. The plant specialists were not able to help at all--they themselves do not remember one such address.

A. Kirsanov, the head of a laboratory of VNIIMP and chief designer of the phonocardiograph, also does not know this address:

"Everywhere where I have indicated to physicians how to handle the instrument, it operates." But the location of these institutions were somehow not written down.

P.S. It may seem to readers that phonocardiograms are not at present being made at our polyclinics. This is not true at all. Dora Yakovlevna Mikhlina takes phonocardiograms and does them well--she has been visited from the entire Timiryazev Rayon. A Soviet instrument rather than some imported instrument stands in her office.

Developed about 30 years ago at the same VNIIMP by A. Rybakov, it has long surpassed all service life allocated to it. But it was made so well in its time at the Leningrad Plant Krasnogvardeyets that it still serves as a reliable assistant to the physician.

How did it happen that the Ministry of Health gave approval to this new instrument, which is much worse than the old one?

6521

JOINT PROGRAM FOR MEDICAL INSTRUMENTS

18400939a Moscow PRAVDA in Russian 28 Jun 87 p 5

[Article by L. Chausov: "For the Sake of Peoples' Health"]

[Text] The Secretariat of CEMA organized this guest briefing. Local journalists were familiarized with how medical equipment is developed by using microelectronics. This is one of the tasks included in the Integrated Program for Scientific and Technical Progress of CEMA Members up to 2000 to solve this difficult problem through joint efforts.

The leading organization involved in the important topic is the All-Union Scientific Research Institute of Medical Instrument Building (VNIIMP). The shops of the experimental plant are located on Timiryazevskaya ulitsa.

Everything is interesting at the permanent exhibition of equipment introduced by common efforts. Take only two exhibits: Binatest and Mnemotest. Both devices, developed by Soviet and Bulgarian instrument builders, are designed for fine and delicate work: evaluation of the functions of the central nervous system of man. This equipment helps to determine the occupational suitability of people who must become dispatchers and operators, aviators and captains of maritime vessels. In short, it facilitates the selection of applicants for occupations related to the greatest risk factor, when any failures and errors are impermissible.

"The cooperative program envisions the manufacture of approximately 80 new products, assemblies and modules of medical equipment through cooperation and specialization," says the director of the institute V. Viktorov, winner of the USSR State Prize. "It should give life to a complex of standardized microprocessor modules--almost 50 types. And this is necessary to avoid unjustified expenditures in operation and to bring problems of repair and service of medical electronics out of a blind alley. This is how things were previously: there was no compatibility of this equipment from different CEMA countries. We are now combining our efforts for the sake of people.

6521

UDC 616.15-082+615.38](470):008

CURRENT STATUS AND PROSPECTS OF BLOOD SERVICES AND MEDICAL ASSISTANCE
FOR HEMATOLOGIC PATIENTS IN RSFSR

Moscow GEMATOLOGIYA I TRANSFUZIOLOGIYA in Russian Vol 32, No 6, Jun 87 pp 3-5

[Article by A. I. Potapov, professor, and V. N. Shabalin, corresponding member,
USSR Academy of Medical Sciences, Moscow]

[Abstract] Considerable advances have been made in the RSFSR in recent years in providing transfusion and blood products for hematologic patients, and in expanding the scope of medical care for this particular category of the sick that includes a large pediatric contingent. Remarkable progress has been made in more efficient utilization of blood resources and blood processing. An extensive network of blood banks and transfusion centers has been established, along with improved medical care facilities geared to the needs of this group of patients. Unfortunately, it has become clear that laboratory diagnosis as a field has not kept pace with medical needs, nor has therapeutic progress equalled that in some other areas. Approximately 80% of the hematologic patients, especially those with chronic leukemia, are being managed on an out-patient basis. Such management does not meet the quality standards seen in hospitals, pointing to the need for upgrading of outpatient clinics and better training for their staff. Many of the difficulties lie in the lack of standardized treatment protocols. In addition, hematologists lag behind other specialties in participating in mass screening programs, a problem that needs to be seriously addressed before any telling improvements in diagnosis and treatment can be anticipated.

12172/5915
CSO: 1840/978

CREATION OF DIAGNOSTIC CENTERS

Moscow IZVESTIYA in Russian 26 Jul 87 p 3

[Article by L. Ivchenko]

[Abstract] The USSR Ministry of Health has decided to create diagnostic centers, large medical institutions equipped with the most modern hardware. This article presents an interview with the chief of the Main Administration for

Therapeutic-Prophylactic Assistance, V. Kalinin. The diagnostic centers will work two or three shifts, providing surrounding hospitals with services such as computerized tomographs. The centers will have a capacity of about 2,000 patients per day and 6,000-8,000 laboratory tests of biological materials. Twenty five are to be organized during the present 5-year plan, four to be opened this year; 2 in Moscow, 1 each in Donetsk and Omsk. The centers will assist in providing annual physical examinations for all citizens, and should reduce the average hospital stay from 17-18 days to 10-12 days, improving pre-hospital diagnostic testing.

6508/5915
CSO: 1840/945

ALCOHOLISM--CAUSE OF INADEQUATE RESPONSE TO TUBERCULOSIS TREATMENT

Alma-Ata ZDRAVOOKHRANENIYE KAZAKHSTANA in Russian No 6, Jun 87 pp 16-17

[Article by K. S. Igemvayeva, and V. A. Shpakovskaya, Semipalatinsk Medical Institute, Oblast Tuberculosis Dispensary]

[Abstract] Chronic alcoholism is the primary factor decreasing the effectiveness of treatment of primary destructive tuberculosis. This was confirmed by clinical observation of 800 patients under observation since 1977-1981. Some 215 of the patients had additional diseases, 35.4% of them having a combination of several diseases, also typical for chronic alcoholics. Alcoholic patients were not as cooperative in taking medication, and were therefore frequently given their medication i/v. Toxic side effects were more frequently observed in chronic alcoholic patients. Earlier diagnosis, complex therapy and broader utilization of surgery can increase the effectiveness of treatment of destructive tuberculosis.

6508/5915
CSO: 1840/938

UDC 616-001.28-036.8

CLINICAL SEQUELAE OF COMBINED RADIATION INJURY

Moscow TERAPEVTICHESKIY ZHURNAL in Russian Vol 59, No 6, Jun 87
(manuscript received 15 Sep 86) pp 8-14

[Article by Ye. Ye. Gogin, Main Military Hospital imeni N. N. Burdenko, Moscow]

[Abstract] A review is presented of combined radiation injury, such as may be encountered at nuclear power stations. Primary emphasis in the review is accorded to the relative doses of gamma and beta radiation in the onset of acute radiation sickness, beta radiation-induced radiodermatitis, and thyroid effects of radioiodine. Discussion is presented of dose-effect relationship and damage to the hematopoietic tissues, the gonads, cardiovascular system, central nervous system and gastrointestinal complications. Respiratory effects due to gases and sols are also covered both from the point of view of primary pathology and as an ingress route. Figures 6; references: 4 Russian.

12172/5915
CSO: 1840/982

UDC 616.98:578.825.12

CYTOMEGALOVIRAL DISEASE (DESCRIPTION OF TWO CASES AND REVIEW OF PROBLEM)

Moscow TERAPEVTICHESKIY ARKHIV in Russian Vol 59, No 6, Jun 87
(manuscript received 3 Feb 87) pp 93-97

[Article by A. V. Demidova, A. M. Charnyy, V. G. Nagornaya, A. P. Mishin, Ye. Ye. Kuznetsova and Ye. A. Popov, Fourth Department of Therapy (Headed by Professor A. V. Demidova), Central Order of Lenin Institute for the Advanced Training of Physicians; Central Clinical Hospital No 1 (Chief Physician A. Ya. Yaroslavskiy, Ministry of Railroads, Moscow)]

[Abstract] Cytomegaloviral disease has been little studied by most practicing physicians, and is therefore infrequently diagnosed or diagnosed only post mortem. Cytomegaloviral disease is a frequent cause of death in AIDS. Laboratory diagnosis of the disease has been relatively recently developed, and involves isolation of the virus from body fluids and determination of the titer of specific blood antibodies by the complement fixation reaction. Case histories are presented. In one case history, fatal outcome occurred without proper diagnosis, although the disease lasted two months, with 17 days in hospital before death. Attending physicians suspected an unknown infection, but diagnosis was made only upon autopsy. The authors draw attention to this opportunistic infection, which should be suspected in fever syndromes generally and in hematologic practice in particular, and also in patients with any immunodeficient states, with transplanted organs and in patients who have received transfused blood. References 8: 4 Russian, 4 Western.

6508/5915
CSO: 1840/983

UDC 616-018.2-031.81-039:616.5-002.525.2]-07:[616.153.962.4-097:578.828

ANTIBODIES REACTING WITH HUMAN IMMUNODEFICIENCY VIRUS ANTIGENS IN SYSTEMIC LUPUS ERYTHEMATOSUS

Moscow TERAPEVTICHESKIY ARKHIV in Russian Vol 59, No 7, Jul 87
(manuscript received 1 Apr 87) pp 40-42

[Article by Ye. L. Nasonov, L. Z. Aleksandrova, M. N. Kornyeva, S. K. Solovyev, D. N. Nosik, A. A. Yanshin, E. M. Rogova, V. N. Titov and V. M. Zhdanov, All-Union Cardiologic Scientific Center, USSR Academy of Medical Sciences; Institute of Rheumatology, USSR Academy of Medical Sciences; Institute of Virology imeni D. I. Ivanovskiy, USSR Academy of Medical Sciences, Moscow]

[Abstract] A study is reported of anti-HTLV-III in donors and patients with systemic rheumatic diseases with possible viral etiology factors. Sera were studied from 75 donors and 143 patients, including 58 with SLE, nine with rheumatoid arthritis, two with Bekhterev's disease, one with dermatomyositis, 30 with dilatation cardiomyopathy, 40 with acute lymphoblastic leukemia. Positive results were achieved in anti-HTLV-III studies in one of the 75 donors, 27 of 58 SLE patients, none of the other patients. No positive reactions were observed in studies of the interaction of the serum of the patients with viral antigens by the immunoblotting method. This indicates absence in SLE patient's sera of antibodies specifically reacting with human immunodeficiency virus antigens indicating that the reactions are false positives. The results indicate a need for careful approach to interpretation of the results of determining anti-HTLV-III by the immunoenzyme method in patients with systemic rheumatic diseases. Figures 2; references 15: 1 Russian, 14 Western.

6508/5915
CSO: 1840/983

UDC 578.82/83

PERSISTENT INFECTION INDUCED BY VIRUS OF HEMORRHAGIC FEVER WITH RENAL SYNDROME IN RED VOLES (CLETHRIONOMYS GLAREOLUS), NATURAL HOSTS OF VIRUS

Kiev MIKROBIOLOGICHESKIY ZHURNAL in Russian Vol 49, No 3, May-Jun 87
(manuscript received 14 Jan 86) pp 99-106

[Article by S. B. Bogdanova, I. N. Gavrilovskaya, V. A. Boyko, I. A. Prokhorova, M. B. Linyev, N. S. Arekina, Ye. A. Gorbachkova, I. V. Rymalov, A. D. Bernshteyn and M. P. Chumakov, Institute of Poliomyelitis and Viral Encephalitides, USSR Academy of Medical Sciences, Moscow; Kazan Affiliate, Institute of Biology, USSR Academy of Sciences]

[Abstract] Results are presented from a study of experimental and spontaneous infection of red voles in experiments involving long-term observation. Infection with hemorrhagic fever with renal syndrome (HFRS) was asymptomatic, the criterion of infection being presence of the antigen, infectious virus and/or antibodies to the HFRS virus in the blood. The virus was found to have clear

viscerotrophicity. The primary target was the capillary endothelium. The infection was found to be persistent. The role of ectoparasites in transfer of the infection was not determined, the antigen being found in none of the parasites. The infection developed identically in red mice which were free of parasites. The vertical path of transmission is also apparently not significant, since the offspring of infected females were not found to be infected, even after 31 days of life. Figures 2; references 10: 5 Russian, 5 Western.

6508/5915
CSO: 1840/977

UDC 578.82/83

ISOLATION OF STRAINS OF VIRUS OF HEMORRHAGIC FEVER WITH RENAL SYNDROME IN
CELL CULTURE

Kiev MIKROBIOLOGICHESKIY ZHURNAL in Russian Vol 49, No 4, Jul-Aug 87
(manuscript received 14 May 86) pp 65-70

[Article by M. B. Linev, I. N. Gavrilovskaya, M. P. Chumakov, Ye. A. Gorbachkova, S. B. Bogdanova and N. S. Arekina, Institute of Poliomyelitis and Viral Encephalitides, USSR Academy of Medical Sciences, Moscow]

[Abstract] Data are presented on the isolation of three strains of the virus of hemorrhagic fever with renal syndrome (HFRS) from the lungs of red voles (*Clethrionomys glareolus*) caught in HFRS foci in the Udmurt ASSR and on the nature of persistence of the strains isolated in a Vero E6 cell culture. The strains were compared with prototype HFRS virus strains. The presence of antibodies in the blood was not found to be a serious obstacle to isolation of the HFRS virus from the lungs of the voles, as had been previously reported. Experiments with hyperimmune sera and convalescent sera indicate close affinity of the isolated strains to the European HFRS virus serotype. Fluctuations in the percents of antigen-containing cells are probably explained by fluctuations in sensitivity of Vero E6 cell lines to the virus. The mechanism of persistence of the virus in the Vero E6 cell culture needs further study. A negative effect on viral reproduction of cellular interferon cannot be excluded. Figures 2; references 17: 4 Russian, 13 Western.

6508/5915
CSO: 1840/977

DETERMINATION OF SPECIFIC IMMUNE COMPLEXES AND DYNAMICS OF THEIR CIRCULATION
IN PATIENTS WITH HEMORRHAGIC FEVER WITH RENAL SYNDROME

Kiev MIKROBIOLOGICHESKIY ZHURNAL in Russian Vol 49, No 4, Jul-Aug 87
(manuscript received 14 May 86) pp 71-76

[Article by I. N. Gavrilovskaya, V. K. Podgorodnichenko, N. S. Arekina, Ye. A. Gorbachkova, S. B. Bogdanova, G. Kh. Kodkind, M. B. Linyev and M. P. Chumakov, Institute of Poliomyelitis and Viral Encephalitides, Moscow; Institute of Medical Radiology, USSR Academy of Medical Sciences, Obninsk]

[Abstract] A significant role of immune complexes has been suggested in the pathogenesis of hemorrhagic fever with renal syndrome (HFRS) in man. This article suggests a method based on the fact that, with excess antigen in the composition of immune complexes in the blood of HFRS patients, the immune complexes may be adsorbed on a solid phase preadsorbed with specific antibodies. The immobilized immune complex can then be revealed by the direct immunoenzyme method by means of specific labeled antibodies binding with free antigen determinants in the immune complex. A comparative study of 50 pairs of sera from 26 HFRS patients showed that all of the antigen-nonspecific methods used reveal immune complexes in the blood of HFRS patients with varying frequency. As with many other viral infections, therefore, the blood of patients regularly contains immune complexes. For the first time, the specific nature of the immune complexes with HFRS was demonstrated, showing that the immune complexes may include both antigens similar in molecular mass to the HFRS virus, in the early stage of the infection, as well as low-molecular-weight virus-specific antigens. The results proved that beginning in the first days of the disease, elimination of specific antigens begins, including possibly elimination of the HFRS virus. By the period of early convalescence, the circulation of the antigen in immune complexes is basically completed. Figures 4; references 13: 4 Russian, 9 Western.

6508/5915
CSO: 1840/977

PROPAGATION OF HANTAVIRUSES AMONG WILD MAMMALS IN BELGIUM AND ITS
INFECTIOUSNESS

Bratislava ACTA VIROLOGICA in Russian No 1, Jan 87
(manuscript received 27 Mar 86) pp 43-52

[Article by R. Verhagen, G. Van Der Groen, A. Ivanov**, J. Van Rompaey, H. Leirs and W. Verheyen, Laboratory of General Zoology, State University Center of Antwerp, Antwerp; Institute of Tropical Medicine, Belgium; **Institute of Poliomyelitis and Viral Encephalitides, USSR Academy of Medical Sciences, Moscow]

[Abstract] This article reports on preliminary results of a study of the propagation of Hantaviruses in the population of wild mammals trapped in

various geographic regions of Belgium, as well as result of investigation of an intensively infected population of European voles (*Clethrionomys glareolus*) living in the province of Antwerp. The presence of specific antibodies and antigens was studied in these animals as a function of age and sex. The results of the studies convincingly indicate that the vole is the main host for the rural type of Hantavirus in Belgium, corresponding to data obtained in Finland and in the Western USSR. Forest mice were found to be much less infected than the voles. The probability of infection apparently increases with age of the voles, beginning at a weight of 12-14 g. Animals with less weight than this are less sensitive, possibly due to maternal passive immunity. References: 20 Western.

6508/5915
CSO: 1840/973

EXPERIMENTAL DUAL INFECTION OF *DERMACENTOR RETICULATUS* TICKS WITH TICK-BORNE ENCEPHALITIS VIRUS AND *COXIELLA BURNETII*

Bratislava ACTA VIROLOGICA in Russian No 1, Jan 87
(manuscript received 4 Nov 85) pp 65-72

[Article by J. Rehacek, E. Kovacova, F. Ciampor, M. Gresikova and I. V. Tarasevich*, Institute of Virology, Slovak Academy of Sciences, Bratislava;
* Scientific Research Institute of Epidemiology and Microbiology imeni N. F. Gamaleya, USSR Academy of Medical Sciences, Moscow]

[Abstract] A study is made of mixed infection of ticks with tick-borne encephalitis and *Coxiella burnetii* in order to answer the question: Can these two pathogens simultaneously multiply in the vector, in its organs or cells? The mixed-tick infection was studied primarily from the standpoint of possible interference of the pathogens. Electron-microscope studies of hemolymph and internal organs of the ticks showed that both pathogens were multiplying and accumulated in the cells and tissues of *D. reticulatus*. An artificial path of infection of the ticks by injection was used rather than the natural path by blood sucking in order to simplify the studies. The quantity of *C. burnetii* and tick-borne encephalitis virus was the same with mixed and mono-infections of ticks. Massive multiplication of *C. burnetii* and significantly less massive replication of the tick-borne encephalitis virus was observed in all cases, probably due to the properties of the pathogens and their interaction with the species of tick studied. References 10: 3 Russian, 7 Western.

6508/5915
CSO: 1840/973

PARTIAL CHARACTERISTICS OF HANTAVIRUS ISOLATED FROM CLETHRIONOMYS GLAREOLUS
CAUGHT IN BELGIUM

Bratislava ACTA VIROLOGICA in Russian No 2, Mar 87
(manuscript received 23 Apr 86) pp 180-184

[Article by G. Van Der Groen, G. Bellaert, G. Hoofd, H. Leirs, R. Verhagen, H. Yamanishi*, Ye. A. Tkachenko** and A. P. Ivanov, Institute of Tropical Medicine, Antwerp, Belgium; Laboratory of General Zoology, University Center, Antwerp, Belgium; *Scientific Research Institute of Microbial Diseases, University of Osaka, Japan; **Institute of Poliomyelitis and Viral Encephalitis, USSR Academy of Medical Sciences, Moscow]

[Abstract] The method of indirect immunofluorescence was used to demonstrate the presence of antibodies to Hantavirus in the serum of humans, wild and laboratory rodents in Belgium. The article presents new proof of the existence of Hantavirus in Belgium, by extracting it from the lungs of wild Clethrionomys glareolus on vero cells, clone E6, transplanted line of African green marmoset kidney cells. Belgian strain CG 13891 of Hantavirus and the strain Hallnas are closely related and differ from Far Eastern Asiatic strains, indicating that a laboratory outbreak of the disease in Belgium was caused by a virus other than the virus which circulates in the remaining population.

References: 13 Western.

6508/5915
CSO: 1840/973

UDC 615.371:578.833

CLINICAL-IMMUNOLOGICAL STUDY OF EFFECTIVENESS OF VACCINATION AGAINST TICK-BORNE
ENCEPHALITIS IN PRIMORSKIY KRAY

Moscow VOPROSY VIRUSOLOGII in Russian No 2, Mar-Apr 87
(manuscript received 23 Dec 85) pp 225-228

[Article by G. N. Leonova, S. P. Kruglyak, N. M. Stenanova and V. N. Gorelikov, Scientific Research Institute of Epidemiology and Microbiology, Siberian Department, USSR Academy of Medical Sciences, Vladivostok]

[Abstract] An analysis is presented of the influence of vaccination on the severity of the clinical course of tick-borne encephalitis in Primorskiy Kray, as well as a comparative study of the humoral immunity in the long term after immunization with a liquid culture vaccine and dry concentrated vaccine. Persons inoculated with the liquid vaccine had a morbidity of 3.7 per 100,000 as against 4.3 per 100,000 for non-inoculated persons, with practically identical severity. Ineffectiveness of the liquid culture vaccine resulted from incorrect antigen version of the vaccine, low immunogenicity of the liquid culture vaccine, the complex and extended vaccination scheme. The new concentrated vaccine requires a simpler two-step vaccination scheme and achieves $90.7 \pm 4.4\%$ presence of virus-neutralizing antibodies one year after vaccination. References: 11 Russian.

6508/5915
CSO: 1840/947

USE OF IMMUNE WESTERN BLOT METHOD TO STUDY VIRAL ANTIGENS AND DETECT ANTIBODIES TO VIRAL PROTEINS

Moscow VOPROSY VIRUSOLOGII in Russian No 3, May-Jun 87
(manuscript received 3 Jul 86) pp 317-323

[Article by V. E. Berezin, G. K. Vorkunova, G. R. Matsevich, V. M. Zaydes, S. S. Marennikova and A. G. Bukrinskaya, Institute of Virology imeni D. I. Ivanovskiy, USSR Academy of Medical Sciences; Institute of Viral Preparations, USSR Public Health Ministry, Moscow]

[Abstract] A description is presented of the Western blot method as used to study antigens and reveal antibodies to viral proteins, and examples of the use of the method for these purposes are given. Human serum was studied to locate AIDS viral protein antibodies. The sera tested were preselected based on the results of solid phase ELISA determinations using the "Organon" (Dutch) system. Sera with a high positive AIDS virus antibody signal upon double ELISA determination were selected for analysis by the Western blot method. Sera which tested positive for AIDS antibodies by ELISA method contained antibodies to various proteins of the AIDS virus. Some ELISA-positive sera were found to react with cellular proteins present in the antigen. HBsAg studies were used to demonstrate the possibility of detecting individual viral antigens in whole plasma. Advantages of the Western blot method are noted: separation of proteins in the initial stage decreases the requirements for chemical purity of the antigen in the preparation studied; it is possible to identify many individual antigen-antibody pairs in complex mixtures. Figures 6; references 14: 3 Russian, 11 Western.

6508/5915
CSO: 1840/972

USE OF ENTEROTOXINS ADSORBED ON FILTERS TO PRODUCE HUMAN IMMUNE INTERFERON

Moscow VOPROSY VIRUSOLOGII in Russian No 3, May-Jun 87
(manuscript received 7 Jan 86) pp 327-329

[Article by O. N. Sheglovitova, A. N. Noskov, M. N. Soloveva, L. M. Mentkevich, Yu. V. Yezenchuk, L. N. Pokidysheva and T. G. Orlova, Scientific Research Institute of Epidemiology and Microbiology imeni N. F. Gamaleya, USSR Academy of Medical Sciences, Moscow]

[Abstract] Results are presented from experiments on induction of human immune interferon in leukocytes by enterotoxins adsorbed on millipore nitrocellulose filters. The method had significant advantages over induction by enterotoxins immobilized on Sepharose. Staphylococcus aureus enterotoxins A and B were used in the studies, which showed that production of immune interferon not

containing an inductor can be achieved by the use of these enterotoxins adsorbed on millipore nitrocellulose filters. Another advantage of the method is the possibility of repeated application of filters with the adsorbed enterotoxins. References: 4 Western.

6508/5915
CSO: 1840/972

UDC 616.98:578.833.27]-092.9:612.017.1

CHANGES IN IMMUNE ORGANS OF SYRIAN HAMSTERS INFECTED WITH TICK-BORNE ENCEPHALITIS VIRUS STRAINS OF VARYING VIRULENCE

Moscow VOPROSY VIRUSOLOGII in Russian No 3, May-Jun 87
(manuscript received 15 Jan 86) pp 342-347

[Article by V. Ya. Karmysheva and V. V. Pogodina, Institute of Polyomyelitis and Viral Encephalitides, USSR Academy of Medical Sciences, Moscow]

[Abstract] Syrian hamsters infected cerebrally with 31 strains of tick-borne encephalitis virus were used in a comparative study of the degree of virulence of the strains, their serotypes, forms and course of the disease, mean survival time, specifics of central nervous system pathomorphology, dynamics of cellular and humoral immunity. The strains studied were divided into three groups: Acute, subacute and asymptomatic infecting strains. The immune response was found to be formed within the first day after administration of the virus. This article describes the histologic and immunomorphologic preparations of the immune organs of the hamsters prepared during the course of the studies. Specific damage of the lymphoid organs by the tick-borne encephalitis virus was discovered and morphologic peculiarities of the process upon infection with strains with varying degrees of virulence described. The results indicated significant specific damage of the lymphoid organs even with asymptomatic infection and demonstrated the morphologic substrate of the process. Some parallels were observed in the development of morphologic changes in the organs and the dynamics of cellular and humoral immunity in the animals. The more favorable prognosis of infection with the low-virulence strains apparently is related to a great extent with the reduced destructive changes of the immune organs and the development of more active proliferative processes in them. Figures 2; references: 5 Russian.

6508/5915
CSO: 1840/972

UDC 615.276.4:577.113.5].015.2:615.451.234].015.44:578.245.2

INTERFERON-INDUCING ACTIVITY OF DOUBLE-STRANDED POLYNUCLEOTIDES
INCORPORATED INTO LIPOSOMES AND MEANS FOR ENHANCING IT

Moscow VOPROSY VIRUSOLOGII in Russian No 3, May-Jun 87
(manuscript received 13 Jan 86) pp 352-357

[Article by S. S. Grigoryan, F. I. Yershov, A. M. Poverenny, V. K. Podgorodnichenko and G. A. Popov, Institute of Virology imeni D. I. Ivanovskiy, USSR Academy of Medical Sciences, Moscow; Institute of Medical Radiology, USSR Academy of Medical Sciences, Obninsk]

[Abstract] The use of highly active domestic high-molecular-weight interferon inducers requires parenteral administration. The development of methods of internal administration is therefore a pressing problem, directly related to their future clinical use. This article presents the results of studies and comparison of interferon-inducing ability of natural dsRNA contained in liposomes with internal and parenteral administration in the body and on cell cultures. Incorporation into liposomes is found to cause interferon induction to increase by a factor of four upon parenteral administration. Internal administration is approximately as effective as parenteral without liposomes; incorporated in liposomes, dsRNA induces interferon for an additional 24 hours, this period of increase rising to five days upon preliminary treatment with empty liposomes. The data obtained in the studies indicate that synthetic and natural dsRNA in liposomes can be used by oral administration to induce serum interferon. The liposomes protect the substances they contain, assure their stability and intactness both in the digestive tract and in the blood stream. dsRNA in liposomes is more stable for both internal and parenteral administration. Figures 4; references 11: 4 Russian, 7 Western.

6508/5915
CSO: 1840/972

UDC 615.281.8.015.44:[578.828:578.233

STUDY OF EFFECT OF RIBAMIDAL AND PHOSPHONOFORMIC ACID ON REPRODUCTION OF
HTLV-III RETROVIRUS IN VITRO

Moscow VOPROSY VIRUSOLOGII in Russian No 3, May-Jun 87
(manuscript received 19 May 86) pp 364-366

[Article by S. L. Nesterchuk, S. V. Gribencha, I. F. Barinskiy and V. M. Zhdanov, Institute of Virology, imeni D. I. Ivanovskiy, USSR Academy of Medical Sciences, Moscow]

[Abstract] A study is presented of the effect of Soviet ribamidal and sodium phosphonoformate on the replication of HTLV-III in an H9 culture. Previous studies have demonstrated an inhibiting effect of foreign versions of the two substances tested on the replication of HTLV-III in vitro. This article was

intended to test the Soviet versions of these preparations. Both ribamidal and sodium phosphonoformiate synthesized in the Soviet Union were found to suppress reproduction of the AIDS virus in vitro. This suppression for ribamidal is incomplete even with preliminary treatment of cells for 24 hours before infection and repeated application of the preparation. Sodium phosphonoformiate at 680 μ M, even upon one-time application, caused complete suppression of expression of the viral antigens in infected cells. References 13: 1 Russian, 12 Western.

6508/5915
CSO: 1840/972

UDC 615.276.4:577.113.5].036.8

ACTIVITY OF SYNTHETIC POLYNUCLEOTIDES SHIELDED BY POLY-L-LYSINE

Moscow VOPROSY VIRUSOLOGII in Russian No 3, May-Jun 87
(manuscript received 14 Apr 86) pp 366-369

[Article by F. I. Yershov and A. A. Kadyrova, Institute of Virology imeni D. I. Ivanovskiy, USSR Academy of Medical Sciences, Moscow]

[Abstract] Double-stranded synthetic polynucleotides--poly (I)·poly (C), poly (G)·poly (C)--are clinically promising interferon inducers, but are little effective when administered to primates, possibly due to the "nuclease barrier," high concentrations of nucleases which destroy these complexes in the blood of humans and primates. The resistance of poly (I)·poly (C) can be increased by the use of poly-L-lysine in the presence of carboxymethyl cellulose. This article studies the toxicity, interferon induction and antiviral activity of the first domestic screening preparations of poly (I)·poly (C) and poly (G)·poly (C) synthesized at the Institute of High Molecular Weight Compounds, USSR Academy of Sciences and Leningrad Institute of Nuclear Physics imeni B. P. Konstantinov, USSR Academy of Sciences. The data indicate low toxicity, high interferon induction and high antiviral activity of these domestic substances, indicating that the preparations may serve as the basis for effective, clinically safe interferon inducers. References 14: 7 Russian, 7 Western.

6508/5915
CSO: 1840/972

ALL-UNION BIOCHEMISTRY CONGRESS

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[Article by N. N. Dubovaya]

[Abstract] The Fifth Congress of the All-Union Biochemical Society was held 27-31 Jan 86 in Kiev. Interesting and important achievements in the area of biochemistry were discussed in two plenary lectures by Academician Yu. A. Ovchinnikov and Academician P. G. Kostyuk in 369 symposium reports supplemented by thematic round table discussions and in 1126 exhibits. Ovchinnikov's lecture, "Proteins: The Present and the Future," noted that an important stage in the investigation of the structure of proteins is determination of the primary structure and topography of bacteriorhodopsin, a light-dependent proton pump in halophilic bacteria, as well as the visual pigment rhodopsin. At the symposium on biotechnology, problems discussed included: The use of immobilized enzymes in biochemical research; immobilization of enzymes and cells in fine organic synthesis, including antibiotic production; and new methods in engineering enzymology. The practical result of the problems discussed at this symposium include: 1) Development of new highly effective methods of detecting various physiologically active substances; 2) creation of effective methods of control of viral infections of plants, including monitoring of planting materials and rejection of infected materials; 3) preparation of series flow biocatalytic reactors with immobilized enzymes and cells for practical medical application; 4) large-scale industrial production of semi-synthetic antibiotics with broader action spectrum and less allergic activity; 5) production of prolonged-action preparations based on prostaglandins by biochemical and biological methods; and 6) introduction of effective industrial processes for enzymatic transformation of renewable plant raw materials to sugars, liquid and gaseous fuels. The symposium on medical biochemistry studied methods of immobilization in the creation of directed transport systems for medications. In the area of clinical enzymology, problems of enzyme diagnosis, enzyme pathology and enzyme therapy were discussed. The symposium on immune response biochemistry familiarized participants with problems and achievements in the area of creation of synthetic antigens and vaccines and studied prospects for determination of the molecular bases of antigen action, as well as immune system mediators, compounds which transmit signals between interactions of immunocompetent cells, and the membrane structures of immunocompetent cells and antibodies, discussing the results of studies of regulation of the expression of genes, showing the significance of regulatory nucleotide sequences in various stages of the development of β cells. The organization and part of the structure of these genes have been established. Modification of these genes opens the possibility of regulating the expression of immunoglobulin genes in eukaryotic cells.