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LIFE SCIENCES

BIOMEDICAL AND BEHAVIORAL SCIENCES

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6 June 1984

USSR REPORT  
LIFE SCIENCES  
BIOMEDICAL AND BEHAVIORAL SCIENCES

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## AEROSPACE MEDICINE

### FIRST MIXED CREW IN SPACE

Moscow ZDOROV'YE in Russian No 11, Nov 82 pp 12-14

#### UNSIGNED

[Abstract] The flight of the Soyus T-7 was the first to include a woman, Svetlana Savitskaya, in the crew. This article presents brief statements by O. G. Gazenko, director of the Institute of Medical and Biological Problems, USSR Ministry of Health, A. V. Yermenin, T. N. Krupina and M. A. Novikov concerning the flight. No significant differences were found in the reaction of the female organism and male organism to the extreme factors of space flight. Studies on the ground have shown that women adapt more rapidly and successfully to hypokinesia than men. All agree that women are well suited for future, longer space flights. Figures 2 (photos of crew).  
[279-6508]

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TASKS AND METHODS OF SELECTION OF BARLEY FOR OVERALL DISEASE RESISTANCE

Moscow SELEKTSIYA I SEMENOVODSTVO in Russian No 12, Dec 83 pp 2-5

GARKAVYY, P. F., academician, All-Union Order of Lenin Academy of Agricultural Sciences imeni Lenin, KIRDOGLO, Ye. K., candidate of agricultural sciences, GARKAVYY, O. P., senior agronomist, Department of Selection and Seed Growing, All-Union Selection and Genetic Institute

[Abstract] The history of selection of barley for disease resistance is briefly discussed. Based on the jet variety and its derivatives, a large group of varieties with varying degrees of stability has been developed, though many of them are not resistant to the entire spectrum of barley diseases and do not provide sufficient yield. The Prevenets and Vestnik varieties are noted for their resistance to disease and good yield. Using the best varieties of domestic and foreign grains, back crosses and multistage hybridization, as well as various means for accelerating the selection process with large sample volumes, the authors have found several transgressive forms combining disease resistance with other valuable characteristics. The introduction of the high yield varieties resistant to a number of diseases will be a valuable contribution to the food program of the nation.

[303-6508]



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BIOCENOGENETIC PRINCIPLES OF SYNTHESIS OF VARIETIES IN PROCESSES OF SELECTION  
AND SEED GROWING

Moscow SELEKTSIYA I SEMENOVODSTVO in Russian No 12, Dec 83 pp 6-10

MOLCHAN, N. M., candidate of biological sciences

[Abstract] In 1982, the author studied the yield of a mechanical mixture consisting of equal quantities of winter wheat seeds of forms 1, 3, 4 and 5 of Mironovskaya 808 variety. The variety studied consists of a basically stable but dynamic system with characteristics of typical representatives varying over time. Methods of reproducing heterogeneity presently used in the science of seed growing include crossing within the variety, a factor which is important in maintaining typical variety characteristics and in selecting biologically compatible genotypes in the process of selection.

[303-6508]

UDC: 633.11"324":631.526.32:631.5

YUZHNEYA ZARYA WINTER WHEAT AND SPECIFICS OF ITS CARE

Moscow SELEKTSIYA I SEMENOVODSTVO in Russian No 12, Dec 83 pp 22-24

LYFENKO, S. F., chief of laboratory of variety selection and soft wheat hybrids, All-Union Selection-Genetic Institute and ULICH, L. I., chief, Ul'yanovsk breeding section, Kirovograd oblast

[Abstract] The variety Yuzhnaya zarya was created at the authors' institute by complex multistage hybridization of domestically selected varieties with a specimen from France. During the last stages of the selection process and primary seed production, the composition of the biotype of the variety was monitored by electrophoretic analysis of the composition of gliadins in the grain. The present article describes some of the characteristics of the new variety, equal in speed of maturation to Odessa 51. It is an intensive variety with high potential yield. The new variety has great ecological adaptability. It yields good harvests in many areas where winter wheat is grown, the best results being obtained in the central Ukraine.

[303-6508]

CHARACTERISTICS OF GLUTEN FROM CERTAIN BRANDS OF BELORUSSIAN RYE

Minsk VESTSI AKADEMII NAVUK BSSR in Belorussian No 1, Jan 83  
(manuscript received 11 Jan 82) pp 31-34

LISOVSKAYA, O. P., KHOLODOV, A. G. and GIRS, F. V., Gomel' Cooperative  
Institute, Belorussian Scientific Research Institute of Agriculture

[Abstract] In comparison to wheat gluten, rye gluten has not been adequately studied. Gluten content of several rye brands of different genetic background both diploid and tetraploid was, determining such physical properties as deformation, specific elasticity and hydration as well as protein content and the composition of essential amino acids. It was found that in comparison to diploid rye, the tetraploid rye showed higher content of gluten and lower hydration. Physical properties of both types of gluten were similar as was the composition of essential amino acids. Rye gluten proteins exhibited a 1.56-1.98 ratio of glutamic acid to proline, in comparison to a 4.7 and 4.9-6.1 ratios of wheat gluten and triticale proteins respectively. References 11 (Russian). [394-7813]

ADAPTATIONS LEADING TO INCREASED REPRODUCTIVITY AND ROLE OF HETEROSIS  
IN GENERATIONS OF YELLOW LUPINE POPULATIONS

Minsk VESTSI AKADEMII NAVUK BSSR in Belorussian No 1, Jan 83  
(manuscript received 8 Feb 82) pp 34-38

PALILOV, A. I., SAVCHENKO, A. P., POLKANOVA, T. P. and TRUS, N. K.,  
Institute of Genetics and Cytology, BSSR Academy of Sciences

[Abstract] Results of natural crossing with the indicator variety of generations bred by free pollination and inbreeding were compared showing that the degree of crosspollination increased with increased levels of homozygosis of the genotype obtained under the influence of inbred specimen. Increased autosterility of highly productive population section has a positive effect on crosspollination. Both effects could be useful in increasing the reproductivity and in enlarging the proportion of heterozygous offspring in the population. Existence of specific mechanisms which improve heterosis balance makes it clear that the role of this balance is quite important in determining the properties and productivity of yellow lupine. Structuralization of the population necessitates further improvements in methods for selection of specific grains. References 8 (Russian, 1 by Western authors). [394-7813]

RESISTANCE OF SOLANACEAE TO MACROSPORIOSIS INDUCED BY BIOLOGICALLY  
ACTIVE AGENTS

Moscow SEL'SKOKHOZYAYSTVENNAYA BIOLOGIYA in Russian No 8, Aug 83  
(manuscript received 28 Jul 82) pp 58-62

IVANYUK, V. G., Belorussian Scientific Research Institute of Potato Growing  
and Vegetable Culture, Samokhvalovich Station, Minsk Rayon, Minsk Oblast

[Abstract] Macrosporiosis caused by *Macrosporium solani* Ell et Mart. is among the most harmful diseases of solanum crops. This work presents a study of the influence of various agents such as fungicides, antibiotics and phenol compounds on the biological characteristics of *M. solani*, the macrosporiosis pathogen, and the resistance of various varieties of potatoes and tomatoes to it and various types of treatments. The studies were performed by field experimental methods on susceptible varieties of potato and tomato. Three groups of agents were tested: fungicides--a mixture of 0.02% copper sulfate and 0.02% boric acid--phenol compounds--including para- and ortho-nitrophenol, hydroquinone, pyrocatechin--and antibiotics such as phyto-bacteriomycin, polymycin, trichotecin and kasumin. It was found that most of the compounds used had an inhibiting effect on the macrosporiosis pathogen and increased the protective reaction of the plant tissues. References 11 (Russian). [283-6508]

UDC 575.24:582.1

GENETIC EFFECTS OF GRANOZAN

Alma Ata IZVESTIYA AKADEMII NAUK KAZAKHSKOY SSR: SERIYA BIOLOGICHESKAYA  
in Russian No 1, Jan-Feb 84 pp 9-11

BIYASHEV, G. Z., NURZHANOVA, A. A. and NAMAZBEKOVA, N. K.  
Institute of Botany, Kazakh SSSR Academy of Sciences, Alma Ata

[Abstract] An evaluation was made of the cytogenetic consequences of treatment of barley seeds with granozan (in which the active ingredient is ethylmercurichloride) under different conditions of application of the pesticide. Seeds of Chernigov-5 barley were either air-dried or moist at the time of granozan application in doses of 23-280 mg/200 seeds for laboratory trials and 12-210 mg/200 seeds for field trials. Prior to planting, the seeds were washed with water for 30 min, dried on filter paper and, for the laboratory studies, germinated in a thermostat at 25°C. Air-dried seeds treated with granozan powder (23 mg/200 seeds) showed the lowest incidence of chromosomal mutations (5.22% vs. 3.46% control) and of general incidence of chromosomal aberrations in mitotic cells

(2.63% vs. 2.22% control); treatment of the moistened seeds revealed a much higher incidence of cytogenetic abnormalities. In addition, when applied to air-dried seeds, granozan had no adverse effects on the height of plants, their mass, or grain production. Treatment of barley seeds with granozan should be conducted only with air-dried seeds, since the genetic consequences of such a treatment are minimized. References 3 (Russian).  
[1013-12172]

UDC: 633.111:631.524.88

#### PROBLEM OF SELECTING SOFT WHEAT FOR LEAF RUST RESISTANCE

Moscow SEL'SKOKHOZYAYSTVENNAYA BIOLOGIYA in Russian No 1, Jan 84  
(manuscript received 10 Feb 83) pp 72-75

BUDYNKOV, N. I. and KRUPNOV, V. A., Scientific Research Institute of Agriculture of the Southeast, Saratov

[Abstract] This article discusses changes in the reaction of a limited selection of lines and varieties with different Lr-genes to the local leaf rust population during 1974-1982. The field experiments involved 220 soft wheat specimens, both Soviet and foreign. The significance of individual Lr-genes in the formation of resistance to the leaf rust pathogen is discussed. The infestation of plantings was evaluated on the Mainz-Jackson and Peterson scales. The results for each year are discussed individually. A number of rust-resistant wheat specimens were found. References 10: 5 Russian, 5 Western.  
[281-6508]

UDC: 633.111:631.524.86

#### RESISTANCE OF WHEAT TO VIRUSES AND ITS EVOLUTION WITH INTENSIVE BREEDING

Moscow SEL'SKOKHOZYAYSTVENNAYA BIOLOGIYA in Russian No 1, Jan 84  
(manuscript received 14 Feb 83) pp 86-92

BURDUN, A. M., PANARIN, I. V. and ZABAVINA, Ye. S., Krasnodar Scientific Research Institute of Agriculture imeni P. P. Luk'yanenko

[Abstract] An analysis of the resistance of both spring and winter wheat to viruses, performed by methods developed at the authors' institute, has shown that natural selection under conditions of spontaneous infection and propagation of viruses has primarily resulted in the development of resistance by prevention of contact with the pathogen due to resistance to viral infection carriers. Studies performed over 7 years in special plantings revealed that many strains considered resistant could actually

be infected. Only a few species of *T. Monococcum* were truly resistant. Immune forms of wheat which develop during epiphytotics are not reinforced by natural selection due to the wide variation in dominant viruses from year to year in any given ecozone. Under artificial conditions resistance can be converted to immunity by intensive directed selection. This type of evolution under human control can be accelerated to produce predominantly immune forms of wheat. References 16: 14 Russian, 2 Western. [281-6508]

UDC 632.452:582.1:57.087.1

DETERMINATION OF INCUBATION PERIODS OF RUST FUNGI ON GRAIN CROPS FROM  
ENTHALPY PARAMETERS

Moscow SEL'SKOKHOZYAYSTVENNAYA BIOLOGIYA in Russian No 9, Sep 83  
(manuscript received 20 Jul 82) pp 112-116

TEREKHOV, V. I., KAYDASH, A.S., SOLODUKHINA, L. D., BESSMEL'TSEV, V. I.,  
KOLESNIKOVA, V. I. and KORZACHENKO, N. N., North Caucasian Scientific  
Research Institute of Phytopathology, Krasnodar

[Abstract] Using standard equations for the calculation of mean incubation times in relation to temperature conditions, and summation of enthalpy values calculated for average daily temperatures and air humidity, made it possible to calculate the mean incubation times of rust fungi on grain crops. Specific calculations conducted for *P. graminis*, *P. tritici* and *P. striiformis*, the etiologic agents of brown, stem and yellow rust, respectively, and the equations employed in each case are summarized in tabular form. In the case of stem rust the model was accurate in 78% of the cases to within  $\pm 1$  day, and in the case of the other two species an accuracy of 64% was obtained to within  $\pm 2$  days of the actual incubation time. References 8 (Russian). [407-12172]

VIII ALL-UNION CONFERENCE ON PROBLEMS CONCERNING EXPLORATION AND UTILIZATION  
OF HIGH ALTITUDE FLORA AND VEGETATION

Leningrad BOTANICHESKIY ZHURNAL in Russian Vol 68, No 12, Dec 83  
(manuscript received 4 Jul 83) pp 1704-1709

IVANINA, L. I., Botanical Institute imeni V. L Komarov,  
USSR Academy of Sciences, Leningrad

[Abstract] Over 52 papers were presented at the conference held in Miass City Jun-Jul 82 devoted to advances in current botanical studies at mountainous regions of the USSR: high altitude flora and plant systematization; high altitude vegetation; ecology of mountainous plants; resources, preservation and rational utilization of the plant world. A leading role was played by the papers on composition and genesis of flora and vegetation of Siberia, Far East and Central Asia. This article covers papers not reported in conference abstracts. Among the topics included are: genetic relationship of high altitude flora of Baikal Siberia, tundra-steppes in south Siberia, flora of Chukotka, vegetation zones at high altitude plants in purifying the atmosphere, etc. Report of the activities of the Commission on flora and vegetation studies at high altitudes concluded the session. It was decided to publish the papers in the form of a monograph and a new commission was elected. The next conference is scheduled to be held in 1985 in Kamchatka.  
[395-7813]

UDC: 631.524.82

SOME BIOLOGICAL ASPECTS OF SELECTION FOR RAPID MATURITY

Moscow SEL'SKOKHOZYAYSTVENNAYA BIOLOGIYA in Russian No 10, Oct 83  
(manuscript received 19 Apr 83) pp 3-11

OBRAZTSOV, A. S., All-Union Scientific Research Institute of Feeds  
imeni V. R. Williams, Lugovaya Station, Moscow Oblast

[Abstract] Rapid maturity or "earliness," when combined with high yield, is a desirable characteristic for agricultural crops. Earliness refers to the calendar time between the beginning of the growth and harvest. Although early maturing plants may theoretically yield smaller harvests under ideal or standard conditions, in the real world, with less than ideal growing conditions and weather, this difference disappears. Data are presented on a few primary aspects of the problem of selection of plants for earliness and productivity. References 15: 14 Russian, 1 Western.  
[282-6508]

BIOLOGICAL PREREQUISITES FOR SELECTION OF SPRING WHEAT FOR EARLINESS

Moscow SEL'SKOKHOZYAYSTVENNAYA BIOLOGIYA in Russian No 10, Oct 83  
(manuscript received 20 Feb 82) pp 24-30

KUZ'MINA, K. M. and KUMAKOV, V. A., Scientific Research Institute  
of Agriculture of the Southeast, Saratov

[Abstract] The major specifics in the biology of early and late varieties of spring wheats and their importance for selection are discussed. These include differences in the structure of vegetation period with resultant differences in such characteristics as numbers of shoots and resultant differences in productivity under ideal conditions. Under actual growing conditions, the theoretical yield advantage of later varieties disappears, particularly in dry years, when earlier completion of critical growth stages, before the driest time begins, gives the advantage to the theoretically lower-producing early varieties. Figure 1; references 39: 36 Russian, 3 Western.  
[282-6508]

INFESTATION OF SOIL BY HELMINTHOSPORIUM SATIVUM PAMM, KING ET BAKKE AND DEVELOPMENT OF ROOT ROT IN SPRING WHEAT WITH VARYING CROP ROTATIONS

Leningrad MIKOLOGIY I FITOPATOLOGIYA in Russian Vol 16, No 5, 1982  
(manuscript received 1 Jun 76) pp 433-439

MIKHAYLINA, N. I., Scientific Research Institute for Agriculture  
of the Southeast, Saratov

[Abstract] The arid trans-Volga region suffers from root rot caused by *H. sativum* Pamm, King et Bakke, which persists in the soil and on plant residue. The authors studied the pathogen's virulence in various crop rotations from 1970 to 1975. The wheat strains tested were hard *Gordeiforme* 432 and soft *Saratovskaya* 29. Results showed that conidia counts were much lower when perennial grasses were planted in the rotation than when winter crops were the predecessor. Further tests were made of soil strata of 0-10, 10-20, and 20-30 cm. Much higher counts were recorded for cultivated land than for waste land or fallow fields. The perennial grasses were regarded to have a purifying role, resulting in fewer conidia than were found in fallow land. The greatest number of spores were found when spring wheat was the predecessor, and the least when grasses and winter rye preceded the spring wheat planting. The conidia count was not always the most crucial factor in determining root rot infestation in the trans-Volga region. References 13: 12 Russian, 1 Western.  
[433-12131]

## COMPETITIVENESS OF PATHOGEN STRAINS OF BROWN WHEAT RUST

Leningrad MIKOLOGIYA I FITOPATOLOGIYA in Russian Vol 16, No 5, 1982  
(manuscript received 14 Dec 81) pp 439-443

MIKHAYLOVA, L. A. and METREVELI, T. G., All-Union Institute  
for Plant Protection, Leningrad

[Abstract] Competitiveness of pathogen clones in a population depends on their virulence and aggressiveness and can vary widely. The present article reports on tests with a model population cultivated in isolation, so as to restrict the importance of "immigrant" spores. Georgian varieties Motsinave and Lagodekhis grdzeltavtava and Azerbaijani *Aegilops tauschii* subsp. *strangulata* Tzvel. were cultivated. The Georgian varieties were 10% infested with brown wheat rust and the latter, 85%. Results showed that strains that are avirulent to "Tetcher" lines had an advantage in competitiveness with Georgian wheats, but not with the Azerbaijani wheat tested. These variations are attributed to so-called "superfluous" virulence genes in the clones. Local clones consistently had the advantage over "immigrants." Another factor in explaining the aggressiveness of *P. recondita* were so-called "small genes" that corresponded to resistance genes with slight phenotypical manifestation. The resulting instability enhanced their aggressiveness. References 7: 5 Russian, 2 Western.  
[434-12131]

## INTRAVARIETAL VARIATIONS OF WINTER WHEAT PLANTS IN HEAT RESISTANCE

Kiev FIZIOLOGIYA I BIOKHIMIYA KUL'TURNYKH RASTENIY in Russian  
Vol 15, No 6, Nov-Dec 83 (manuscript received 11 Apr 83) pp 578-583

SAVIN, V. N., NIKOLENKO, V. F., ALEKSEYEVA, D. I., Agrophysical Scientific Research Institute, Leningrad and NIKIFOROV, O. A., Northwestern Scientific Production Association for Plant Selection and Cultivation, Siverskaya, Leningrad Oblast'

[Abstract] Increasing yields in important winter wheat crops is a lasting goal for Soviet science. The present article reports on variations in heat resistance for Mironovskaya 808, Bezostaya 1, Kavkaz, Eritro-spermum 127, and Odesskaya 16, 51 and 66 varieties. Seeds were sprouted and cultivated at 25°C, 65% relative humidity and about 20,000 candlepower for 18 hours daily. Chlorophyll content and the temperature dependency of its preservation in leaves were the parameters measured to determine heat resistance. Results indicated that the Kavkaz variety was the least heat



resistant, and Odesskaya 51 the most heat resistant. Variations among individual plants were found to be within normal curve ranges for Kavkaz and Eritrospermum, with greater deviations with the other tested varieties. Plant selection could be made on the basis of those plants identified to be most heat resistant, and this was necessary where significant variations in heat resistance were observed. Figure 1; references 12: 11 Russian, 1 Western.

[436-12131]

UDC 581.1:633.11:632.111.5

#### METHODS OF DIAGNOSING WINTER WHEAT RESISTANCE TO GROUND ICE CRUST

Kiev FIZIOLOGIY I BIOKHIMIYA KUL'TURNYKH RASTENIY in Russian  
Vol 15, No 6, Nov-Dec 83 (manuscript received 18 Aug 82) pp 606-609

KOLBASINA, E. I., All-Union Scientific Research Institute for Plant Research  
imeni N. I. Vavilov, Moscow Department, Mikhnevo in Moscow Oblast

[Abstract] The present article reports on studies from 1974 to 1980 in the Moscow area to determine effects of ground ice crust on winter wheat yields. Three methods were used and evaluated. A field method involved registration of soil temperatures and ice crust thickness and comparison with damage to wheat. The field-laboratory method was to plant seeds in soil taken from fields and placed in boxes for sprouting and cultivation under laboratory control. Dynamics were better observed in this variant, but seasonal limitations made it difficult to bring the plants to yield. The straight laboratory method was useful in preliminary evaluations, which could be conducted regardless of the actual season, with quick results. Its shortcomings were in its restriction to preliminary results and the impossibility of bringing plants to maturity. References 11 (Russian).

[436-12131]

"MIDDLE MOLECULES" GROUP PEPTIDES

Moscow BIOORGANICHESKAYA KHIMIYA in Russian Vol 10, No 1, Jan 84  
(manuscript received 21 Mar 83, after revision 15 May 83) pp 5-17

GALAKTIONOV, S. G., TSEYTIN, V. M., LEONOVA, V. I., Research Post,  
All-Union Scientific Research Institute of Genetics and Selection  
of Industrial Microorganisms, Minsk, NIKOLAYCHIK, V. V., Belorussian  
Scientific Research Institute of Blood Transfusion, Minsk, and  
MIKHNEVA, L. M., Minsk State Medical Institute

[Abstract] This is a review article on formation, structure and mechanisms of biological action of middle molecule peptides (MMP). These peptides, with molecular mass 300-5000 Da, are endotoxins formed during various diseases which disturb regulatory processes, suppress the function of formed elements and modify membrane transport characteristics. The uremic peptides belong to this class. The tripeptide his-gly-lys, found in the dialysis fluid of uremics, could result from the action of plasmin, followed by an aminopeptidase, on hemoglobin. Other peptides found in dialysis fluid appear to originate in fibrinogen, beta-microglobulin, collagen and elastin, with different patterns characteristic of different diseases. The MMP class includes nonsecretory peptide bioregulators and peptide hormones, though these are normally present at very low levels. Regulatory activity has been demonstrated for fibrinogen fragments and possibly albumin degradation products. It is also probable that MMP include sequences which are isoselective or similar in structure to known peptide bioregulators such as taftsin, enkephalin, angiotensin, hepatocyte growth factor and alpha-melanotropin. The MMP possess various nonspecific membranotropic properties. Certain of the pathological effects elicited by MMP may be a result of decreased albumin binding to low molecular weight nonpolar endotoxins. References 128: 30 Russian, 98 Western.  
[497-12126]

## N-GLYCOSYLTHIOCARBAMOYL PEPTIDES--N-ACETYLMURAMOYL-L-ALANYL-D-ISOGLUTAMINE (MDP) ANALOGUES DIFFERING IN SUGAR-PEPTIDE LINKAGE

Moscow BIOORGANICHESKAYA KHIMIYA in Russian Vol 10, No 1, Jan 84  
(manuscript received 15 May 83) pp 18-24

ABASHEV, Yu. P.; Scientific Research Institute of Immunology, USSR Ministry of Health, Moscow, ANDRONOVA, T. M., ZUPRBYAN, S. E., I Moscow Medical Institute imeni I. M. Sechenov, MAL'KOVA, V. P., SOROKINA, I. B. and KHORLIN, A. Ya., Institute of Bioorganic Chemistry imeni M. M. Shemyakin, USSR Academy of Sciences, Moscow

[Abstract] In order to study the immunoregulatory glycopeptides of the bacterial cell wall, particularly the effect of the character of the carbohydrate-peptide bond on biological activity, a series of glycosylthiocarbamoyl-peptide analogues of muramoyl dipeptide were synthesized. The analogues were obtained by reacting glycosylisothiocyanates with the amino group of alanine or unprotected peptides. After deacetylation with sodium methylate eleven products were obtained, containing L-alanine, L-alanyl-D-glutamic acid, L-alanyl-D-isoglutamine or D-alanyl-L-alanyl-D-isoglutamine. The compounds containing the tripeptide demonstrated significant immunosuppressive activity, as indicated by a change in antibody-forming cells in mouse spleen. Two dipeptide analogues were moderately immunoadjuvant. Replacing N-acetyl-D-glucosamine by L-rhamnose led to a loss of adjuvant activity. The data indicate that the lactic acid moiety in muramoyl dipeptide can be replaced with a thiocarbamoyl group without abolishing activity. Three of the compounds suppressed the growth of solid sarcoma 180 tumors in mice and will be investigated further. References 12: 5 Russian, 7 Western.  
[497-12126]

## BIOTECHNOLOGY

### GENES AND SINGLE-CELL PROTEIN

Tallinn SOVETSKAYA ESTONIYA in Russian 16 Feb 84 p 2

FAVORSKAYA, A.

[Abstract] A continuing interview with Endel' Lippmaa, academician of the Estonian SSR Academy of Sciences, summarized some of the recent advances in biotechnology in Estonia and emphasized the interrelationship between basic research and practical applications. Some of the areas currently under investigation are the utilization of new biotechnological approaches in the synthesis of various prostaglandins and their congeners, analysis of structure-activity relationships of important proteins and peptides, development of monoclonal antibodies for diagnostic and therapeutic purposes, research on single-cell protein production, use of enzymes in processing various raw materials, embryo transplantation in cattle, etc. Under the current program in force in Estonia, most of such studies are expected to be successfully completed by 1985.  
[494-12172]

UDC 541.144+581.132+620.92

### PHOTOSYNTHESIS, BIOMASS AND ENERGY PROBLEMS

Kiev VISNYK AKADEMIKI NAUK UKRAYINS'KOYI RSR in Ukrainian  
No 1, Jan 84 pp 18-25

GRODZINSKIY, D. M., corresponding member, Ukrainian SSR Academy of Sciences, and OSTROVSKAYA, L. K., doctor of biological sciences

[Abstract] A review is provided of the current energy crisis in the world in relation to available energy resources. Particular consideration is given to the use of solar energy as it is captured in various photosynthetic processes and converted to products directly or indirectly useful to man. The available biological and agricultural systems are reviewed with respect to solar energy utilization and the extent to which such resources can be harnessed by energy farming, as well as the

initial attempts made in this direction in the Ukraine. Emphasis is also placed on the need for well-equipped and staffed field laboratories to place such endeavors on a solid scientific footing. References 14: 8 Russian, 6 Western.  
[512-12172]

## EPIDEMIOLOGY

### BRIEFS

BACTERIOLOGICAL WEAPONS RESEARCH DEPLORED--On our planet there are ominous pieces of land which have been converted by western nations into ranges for testing weapons of mass annihilation. Along with the Micronesian atolls of Bikini and Eniwetok, the list of graveyards includes a tiny island located just one mile off the shores of Scotland. During World War II, the British conducted tests of bacteriological weapons on this island and sprayed it with spores of malignant anthrax. British powers thoroughly concealed the after-effects of this "experiment," but, as eyewitnesses who wish to remain anonymous report, the results were horrifying and unpredictable. Moreover, the threat of infection remains even now. Only now, forty years later, under pressure of public opinion, has Great Britain been forced to take measures to neutralize this breeding ground of dangerous disease. Not long ago, a more or less acceptable method was finally worked out for ridding the island of spores of malignant anthrax. It is planned literally to flood the island with a special mixture whose basic components are formalin and sea water, and disinfect the territory more than a meter deep. In all, more than a million (!) liters of the formalin mixture will be used. This plan has just one flaw--the mixture will kill all of the island's vegetation. But, as the president of the Chemical Research Establishment explained to the British newspaper SUNDAY TIMES, this is not such a great price to pay to "restore to life" this part of the earth. The fate of the island should be pondered by present-day "experimenters" in the Pentagon's military uniform, who are preparing chemical and bacteriological war on a planetary scale. For if the new jesuitical "inventions" are ever used, there may not even be enough formalin. [By D. Chukseyev] [Text] [Moscow KOMSOMOL'SKAYA PRAVDA in Russian 19 Feb 84 p 3] 12255

CSO: 1840/495

UDC 616.981.455(477.83)

# TULAREMIA IN LVOV OBLAST

Kiev VRACHEBNOYE DELO in Russian No 3, Mar 83

(manuscript received 30 Sep 82) pp 115-116

GURAYEVSKIY, A. P., LUTSIK, B. D., TITOV, V. M. and DASHO, Yu. A.,  
Chair of Infectious Diseases, Lvov Medical Institute; ost Infectious  
Diseases Hospital

[Abstract] Lvov Oblast is said to be enzootic with respect to tularemia; systematic monitoring of the region has been underway since 1963. After a tularemia-free period from 1950 to 1974, five cases of tularemia in humans were reported between December 1974 and March 1975 in Lvov Oblast in Western Ukraine. The patients were villagers infected by coming in contact with contaminated hay or silage. All cases followed a typical clinical course without complications and recovery, the hospital discharges ranging from 35 to 65 days. One case study for a 47 year old female is presented [No information is reported on years after 1975] [417-12172]

UDC 616.9-022.39-084(571.1.6)

# MECHANISM OF ACTION OF CERTAIN ABIOTIC FACTORS ON EPIZOOTIC PROCESSES IN PLAGUE

Moscow ZHURNAL MIKROBIOLOGII EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian  
No 12, Dec 83 pp 89-90

BOGATYREV, S. K., Alma Ata

[Abstract] An evaluation was made of the effects of elevated temperatures on the susceptibility of gerbils to Y. pestis and on the course of the resultant infection. Exposure of the animals to temperatures of 28-30°C for 1, 2 or 4 days and subsequent subcutaneous inoculation of the bacilli showed that susceptibility was not affected to a statistically significant extent. However, animals exposed for 1-2 days to the higher temperatures demonstrated some tendency toward enhanced resistance, while animals exposed for 4 days showed some tendency toward greater susceptibility. Animals initially inoculated with the bacteria and subsequently exposed to the higher temperatures demonstrated enhanced resistance manifested as a lower incidence of septicemia and involvement of the internal organs. These observations can be correlated with the lower incidence of epizootic outbreaks of plague during the hot summer months.  
[401-12172]

FACTORS LEADING TO PROLONGED YERSINIA PESTIS CARRIER STATE IN ALPINE  
GOPHERS AND ITS ROLE IN ENZOOTIC PLAGUE

Moscow ZHURNAL MIKROBIOLOGII EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian  
No 12, Dec 83 pp 90-91

PILIPENKO, V. G., TARASOVA, V. Ye., TARAN, I. F., NAYDEN, P. Ye.,  
POPOV, V. A. and TSYBIN, B. P., Stavropol

[Abstract] Long-term (1971-1981) laboratory and epidemiologic studies demonstrated that the single most important factor predisposing to long-term *Y. pestis* carrier state in the alpine gopher (*suslik*) in the Central Caucasian region is the presence of postinfection immunity. The annual epizootic outbreaks of plague are predicated on the accumulation of a large population of immune gophers, the reinfection of which results in a prolonged carrier state. In a number of such animals the carrier state becomes transformed into an acute infectious process which serves as yet another link that maintains plague in the region.

[401-12172]

DETECTION OF PLAGUE ANTIGENS IN FIELD SPECIMENS BY ELISA

Moscow ZHURNAL MIKROBIOLOGII EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian  
No 12, Dec 83 p 92

GOLUBINSKIY, Ye. P., RUDNIK, M. P., MERINOV, S. P. and MAYEVSKIY, M. P.,  
Irkutsk

[Abstract] Description is provided of the use of ELISA (enzyme-linked immunosorbent assay) for the testing of various specimens collected in nature (fleas, animals, soil, etc.) for the presence of *Y. pestis* antigens. Comparative data were provided by employing the serologies more commonly utilized in such studies (passive hemagglutination, antigen neutralization, antibody neutralization). The results showed the greater sensitivity and specificity of the ELISA technique, as well as its greater speed in providing results in comparison with the standard serologic tests. On the basis of these observations, it appears that ELISA can be recommended for field use in epidemiologic studies on plague.

[401-12172]



#### YERSINIA PESTIS FRACTION I IN FIELD-COLLECTED MAMMALIAN BONES

Moscow ZHURNAL MIKROBIOLOGII EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian  
No 12, Dec 83 pp 92-93

MUAFIKHOV, G. M. and KANATOV, Yu. V., Guryev; Alma Ata

[Abstract] Studies were conducted on the persistence of the specific antigen (fraction I) of *Yersinia pestis* in bones of various mammals collected under field conditions in various areas of the USSR. The bones ranged in age from recent to several hundred years old and their washings were analyzed by passive hemagglutination and antibody neutralization techniques. The results showed that fraction I is sufficiently stable to persist in nature for long periods of time and, under sandy conditions, is generally transformed into a haptan.

[401-12172]

#### PROBLEMS WITH PLAGUE CONTROL IN TUVA ENDEMIC REGION

Moscow ZHURNAL MIKROBIOLOGII EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian  
No 12, Dec 83 pp 95-96

KOLOSOV, V. M., OCHIROV, Yu. D., LEBEDEV, Yu. A., RAVDONIKAS, I. O.  
and ZONOV, G. B., Tuva; Irkutsk

[Abstract] Details are provided on long-term efforts in the Eastern endemic plague region in Tuva to control plague by eradication of carriers and vectors. The current consensus is that eradication of the vectors will be impossible without the use of DDT sprays or its use in other forms. The effectiveness of all the measures taken can be increased 1.5 to 2-fold by encompassing the entire region at one time rather than on a piecemeal basis, with particular attention to the habits and habitats of the long-tailed gopher (suslik).

[401-12172]

# SEROLOGIC DATA ON CIRCULATION OF HEPATITIS A VIRUS (H1N1) AMONG CATTLE IN SOUTHERN KAZAKHSTAN

Alma Ata IZVESTIYA AKADEMII NAUK KAZAKHSKOY SSR: SERIYA BIOLOGICHESKAYA in Russian No 1, Jan-Feb 84, pp 43-45

BAGASHEVA, S. S., SAYATOV, M. Kh., SHAYMUKHAMETOVA, A. Kh. and DAULBAYEVA, K. D., Institute of Microbiology and Virology, Kazakh SSR Academy of Sciences, Alma Ata

[Abstract] Serologic studies were conducted on cattle in the Alma Ata Oblast of Kazakhstan to detect circulating hepatitis A viruses following such reports in Ukraine and other regions. As a result, antibodies against the following viruses were detected: A/Khabarovsk/77(H1N1), A/ozernaya chayka/Kazakhstan/470/79 (H1N1) and A/USSR/80 (H1N1) in 8.7, 8.1 and 8.7% of the tested sera, respectively. These findings indicate that in the region under consideration hepatitis A virus has entered the cattle population. References 4 (Russian). [1013-12172]

UDC 616.61-002.151-06:616.61-008.64-036.11-08:616.61-78

# HEMODIALYSIS IN PATIENTS WITH ACUTE RENAL INSUFFICIENCY AND HEMORRHAGIC FEVER WITH RENAL SYNDROME

Moscow KLINICHESKAYA MEDITSINA in Russian No 8, Aug 83 (manuscript received 2 Feb 82) pp 105-107

ZAGIDULLIN, I. M. and SAKAYEVA, M. F., Bashkir Republican Clinical Hospital imeni G. G. Kuvatov (chief physician, M. Ye. Petrov, doctor of medical sciences), Ufa

[Abstract] Treatment of 131 patients with hemorrhagic fever and renal syndrome with signs of acute renal insufficiency (3 children, 14 women and 114 men ranging in age from 10-54 years) is described and discussed. Patients were admitted on the 14th-17th day of the disease with signs of progressive acute renal insufficiency. Conservative treatment was beneficial in only 24 patients (18.3 percent). In 105 cases (80.2 percent), hemodialysis was performed 229 times in combined therapy. Indication for hemodialysis was determined by an aggregate of clinical data and blood indicators. Hemodialysis was used when the urea in the blood was above 33.3 mmole/liter, creatine above 0.074 mmole/liter (8 mg percent) and hyperpotassemia of more than 6 mole/liter (6 meq/liter). Conservative treatment of 26 patients resulted in recovery of 24 and death of 2 (for whom hemodialysis was completely contraindicated. Of 125 patients treated by hemodialysis, 6 died (5.7 percent). Diagnosis was confirmed in all

cases at autopsy. The significant reduction of mortality from hemorrhagic fever concomitant with renal insufficiency and renal syndrome in the last 3 years is attributed to the use of dialysis therapy. References 6:  
4 Russian, 2 Western.  
[483-2791]

UDC 616.839-07:616.935

#### AUTONOMIC NERVOUS SYSTEM DISORDERS IN SH. SONNEI AND SH. FLEXNERI DYSENTERY

Kiev VRACHEBNOYE DELO in Russian No 6, Jun 83  
(manuscript received 13 Oct 82) pp 112-113

KARASOVSKAYA, L. F., Kiev Scientific Research Institute of Epidemiology and Infectious Diseases imeni L. V. Gromashevskiy, Ukrainian SSR Ministry of Health; Infectious Department, Kovel Central Rayon Hospital

[Abstract] Neurologic and electrophysiologic assessment was conducted on 278 patients with dysentery to evaluate systemic consequences of this disorder. The results demonstrated that such patients frequently suffered from general weakness, vertigo, headache, nausea, sleep disorders, vasomotor disorders indicated by fluctuations in BP and variable pulse rates and, among other symptoms, altered EEG patterns and lack of responsiveness to phono- and photostimulation. In general, these signs were reflective of autonomic system dysfunction and, in the case of the sympathetic nervous system, indicated adaptive changes. The autonomic disorders were in general much more pronounced in the cases of dysentery due to Sh. flexneri than in those due to Sh. sonnei.  
[415-12172]

UDC 616.936-085.283.926-039.71

#### CHEMOPREVENTION OF MALARIA

Moscow SOVETSKAYA MEDITSINA in Russian No 11, Nov 83  
(manuscript received 2 Jun 82) pp 91-93

LOBAN, K. M. and POLOZOK, Ye. S., Department of Infectious Diseases With Epidemiology Course (Chairman - professor K. M. Loban) University of People's Friendship imeni P. Lumumba, Moscow

[Abstract] Malaria continues to be one of the most widely spread diseases in the world, responsible for about 1 million deaths annually, principally among children. The WHO program started in 1955 was a failure and probably not be revived in the near future. Because of increased international exchanges, the number of people exposed to malaria is growing constantly.

Most of the preventive measures are based on individual protection. Anti-malaria drugs can be classified in two groups: schizontotropic preparations (hematoschizontropic preparations like the derivatives of 4-aminocholine, quinine, sulfanilamides and sulfones and histoschizontropic ones like the derivatives of 8-aminocholine) and hemototropic action preparations aimed at the sexual forms of the parasites. Several drugs and various preventive schemes are reviewed. References 11: 4 Russian, 7 Western.  
[354-7813]

UDC 616.98:579.842.14[-078

#### ETIOLOGIC STRUCTURE OF SALMONELLOSIS

Moscow SOVETSKAYA MEDITSINA in Russian No 11, Nov 83  
(manuscript received 25 Apr 83) pp 120-121

AKULOVA, N. K., KONOVALOV, A. I. and IVANOVA, T. N., Central Scientific Research Institute of Epidemiology (Director - V. I. Pokrovskiy), USSR Ministry of Health, Moscow

[Abstract] Experimental results were reported of the study of etiological structure of salmonellosis. The Klinskiy Rayon of Moscow Oblast was studied during 1970-1981 period. In that time, 51 different species were identified; some of them were more common than others, especially the following: *S. typhimurium*, *S. haifa*, *S. heidelberg*, *S. infantis* and *S. derby*. Salmonellosis occurred throughout the year but it peaked during summer months. Different species accounted for the majority of infections in different study periods. This probably could be due to the spread of the disease through special disease centers (in at least one case through a children's hospital). Figure 1; references 8: 5 Russian, 3 Western.  
[354-7813]

UDC 616.98:579.834.115-036.22

#### URGENT PROBLEMS OF LEPTOSPIROSIS

Moscow SOVETSKAYA MEDITSINA in Russian No 10, Oct 83  
(manuscript received 4 Aug 82) pp 108-111

UGRYUMOV, B. L., FROLOV, A. F. and BERNASOVSKAYA, Ye. P., Kiev Scientific Research Institute of Infectious Diseases imeni L. V. Gromashevskiy

[Abstract] Analysis of over 2000 serologically proven cases of leptospirosis identified seven serum groups among which icterohemorrhage (more than 50% of all cases) was by far the predominant etiological factor. This disease was shown to be on increase during recent years not only in summer but also during autumn-winter season. Cattle, pigs, rats and small wild mammals are the principal vectors of this disease in the Ukraine. The

principal problem in treating leptospirosis and the reason for high lethality is misdiagnosis. More than 50% of the cases entered various hospitals under wrong diagnosis; most of them were hospitalized after five days of manifested symptoms. Principal causes of death were: acute renal deficiency, toxic infectious shock, pneumonia and hemorrhagic syndrome. References 6 (Russian) [7813-355]

UDC 616.927-02:579.861.2

#### EFFECT OF EPIDERMAL STAPHYLOCOCCUS ON COURSE OF TYPHOID FEVER

Moscow SOVETSKAYA MEDITSINA in Russian No 10, Oct 83  
(manuscript received 7 Jun 82) pp 44-47

IL'INSKIY, Yu. A., ZHARIKOVA, O. A., KRASNOGOLOVETS, V. N. and  
POGOREL'SKAYA, L. V., Department of Infectious Diseases (Chairman - professor  
Yu. A. Il'inskiy) Second Moscow Medical Institute imeni N. I. Pirogov

[Abstract] In the present paper the effect of epidermal staphylococcus on the course of typhoid fever was discussed, based on observation of 113 patients. On the basis of clinical findings all patients were divided into two groups: those which showed presence of epidermal staphylococci in blood, feces, urine or bile and those that did not. In general, it was shown that staphylococcus epidermidis coupled with typhoid fever changed the clinical symptoms of the disease: the course of this disease became more protracted and more severe with possible complications and relapses. The predetermining factors toward activation of staphylococcal infection were: development of dysbacteriosis, drug related disease and aggravation of chronic infection foci. In cases of prolonged fever during treatment with levomycetin and during lingering subfebrilitis, repeated bacteriological blood studies were recommended aimed at finding out secondary staphylococcal infections. References 5: 3 Russian, 2 Western. [355-7813]

POPULATION ECOLOGY OF PATHOGENS FROM NATURAL INFECTION FOCI: PRINCIPLES, OBJECTS, TASKS

Moscow USPEKHI SOVREMENNOY BIOLOGII in Russian Vol 96, No 1 (4),  
Jul-Aug 83 pp 132-138

LITVIN, V. Yu., Scientific Research Institute of Epidemiology and Microbiology imeni N. F. Gamaleya, USSR Academy of Medical Sciences, Moscow

[Abstract] Ecology of pathogenic microorganisms developed at a much slower rate than the ecology of other organisms because of the methodological complexity of studying these agents, which are difficult to register and to quantify. The need for such studies is stressed in the present paper which covers three main topics: mechanism of pathogen population stability, structure of pathogen population and the numerical dynamics of pathogen population. The stability of pathogens in natural foci can be achieved in two ways: the active one (circulation of the pathogens) and the passive one (preservation of the pathogen in the propagation medium). The most crucial tasks in the population ecology of pathogens include analysis of the mechanisms of the protection of pathogens during interepizootic periods and its relationship to various habitat media; elucidation of all possible passage routes and their importance in pathogen ecology; analysis of pathogen population heterogeneity; quantitative evolution of the structure and dynamics of pathogens during the annual cycle; mechanisms of their stability in the ecosystem of natural infection foci and ecological classification of the basis of convergent similarities. References 23: 22 Russian, 1 Western.  
[384-7813]

## FOOD TECHNOLOGY

### CAUSES OF WIDESPREAD FRUIT, VEGETABLE LOSSES EXAMINED

[Editorial Report] Tbilisi KOMUNISTI in Georgian on 13 December 1983 page 3 under the regular rubric "The People's Watchful Eye" carries a 2,100-word article by Dzh. Kvirtia, a deputy head of the Peoples Control Committee's Agriculture Department, concerning the causes of widespread losses of fruits and vegetables during and after harvest--losses due to spoilage, rotting, and quality deterioration. Causes included improper storage and packing, lack of transport, and especially big discrepancies between deliveries by procurement outfits and the processing capacities of the canning factories. A joint investigation of the matter participated in by specialists of the Agricultural Production Committee and the Fruit and Vegetable Ministry found mismanagement, neglect, and poor organization in Gruzsel'zagotovka, Gruzkonservprom, and the agroindustrial-trade associations, and a number of managers and officials were reprimanded and fined. One passage in the article deals with the matter of arbitration in the frequent cases when recipients claim monetary damages against suppliers for underdeliveries or substandard quality; most such disputes are resolved in favor of the customer. Several instances are cited in which the proper recipient is shorted while another recipient gets considerably more than he ordered.

CSO: 1813/835

BASIC DIRECTIONS OF RESEARCH IN DEVELOPING DRY MILK MIXES FOR CHILD AND DIETETIC NUTRITION

Moscow KONSERVNAYA I OVOSHCHESUSHIL'NAYA PROMYSHLENNOST' in Russian  
No 12, Dec 83 pp 7-9

BRENTS, M. Ya., candidate of technical sciences, Nutrition Institute,  
USSR Academy of Medical Sciences

[Abstract] Creation and production of new specialized foods for children involve identification of what is needed, research and development, testing and practical implementation before necessary nutritional objectives are met. The present article emphasizes nutrition for children under one year of age, particularly in cases where mother's milk is deficient in quantity or quality for various reasons. The author discusses the brands and locations of Soviet plants for producing powdered dietary supplements for both healthy and ill infants. Problems of restoring the biological qualities of dried milk, use of sour milk products with selected milk bacteria, and enriching such dietary supplements, are discussed. Grain supplements as nutritional additives to cooked cereals are stressed. Fruit and vegetable additives and approaches to improving milk formulas to make them more like mother's milk are also noted.

[435-12131]



## GENETICS

UDC 575.113 + 577.21

### GENETIC TRANSFORMATION IN PLANTS: PROBLEMS AND PROSPECTS

Minsk VESTSI AKADEMII NAVUK BSSR in Belorussian No 1, Jan 83  
(manuscript received 20 May 82) pp 20-26

KARTEL', M. A., Institute of Genetics and Citology, BSSR Academy of Sciences

[Abstract] This is a review of the literature for the past decade on genetic transformations in plants. Most of the results obtained by active investigators could be explained by assuming formations and functioning of episome-like structures in plant cells, because otherwise the accumulated data did not fit the classical concepts of genetic transformation. Protoplasts, pollen and intact embryos were considered as possible recipient systems for genetic transformation. The most promising vector for introduction of foreign genes into plant cells appeared to be the Ti-plasmid. The study of genetic engineering in its application to plants is expected to lead to new genotypes with desired properties in new highly productive plants resistant to various diseases. Figure 1; references 26: 9 Russian, 17 Western (2 by Russian authors).  
[394-7813]

UDC 579.842.14:579.25

### MAPPING OF K ANTIGEN GENE IN SALMONELLA. PART 1. CONJUGATION STUDIES

Moscow ZHURNAL MIKROBIOLOGII EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian  
No 12, Dec 83 (manuscript received 19 Apr 83) pp 27-30

TARUTINA, Z. Ye., ROMANOVA, Yu. M., STEPANOVA, L. K. and PETROVSKAYA, V. G..  
Institute of Epidemiology and Microbiology imeni N. F. Gamaleya,  
USSR Academy of Medical Sciences, Moscow

[Abstract] Description is provided of conjugation studies designed to map the location of the K antigen gene on *Salmonella typhimurium* chromosome. Using an autotrophic K<sup>-</sup> mutant a number of auxotrophic mutants were obtained by induced mutation and used as recipients in crossings with

K<sup>+</sup> Hfr strains that differed in the initiation point. Acquisition of the K<sup>+</sup> phenotype was followed by means of agglutination tests with K-specific antibodies. The K gene was found to be located between the 41 and 46 min region and is not cotransduced with the His<sup>+</sup> marker (44 min) since none of the His<sup>+</sup> cells were agglutinated by the K-specific antiserum. Figures 1; references 11: 8 Russian, 3 Western.  
[401-12172]

UDC 576.8.097.2:[577.213.7+577.217]

#### GENETIC ENGINEERING AND CREATION OF ANTIVIRAL VACCINES

Moscow SEL'SKOKHOZYAYSTVENNAYA BIOLOGIYA in Russian No 9, Sep 83  
(manuscript received 25 Apr 83) pp 97-104

TIKHONENKO, T. I., Institute of Virology imeni D. I. Ivanovskiy,  
USSR Academy of Medical Sciences, Moscow

[Abstract] A literature survey is presented of the current advances and success in the use of genetic engineering for the creation of antiviral vaccines for medical and veterinary use. In addition to the standard approaches relying on bacterial systems, the current status of research on the use of fungal and eucaryotic systems, as well as tissue-culture and cell-culture systems are also covered. A particularly appealing approach is the expansion of such techniques to create chimeric vaccines, i.e., capsid protein containing antigenic determinants of two or more different viruses. References 49: 12 Russian, 37 Western.  
[407-12172]

UDC 577.323.7

#### PROTEINS ALTERING CONFORMATION OF DNA AND THEIR PRINCIPAL ROLE IN GENETIC RECOMBINATION

Moscow USPEKHI SOVREMENNOY BIOLOGII in Russian Vol 96, No 1 (4), Jul-Aug 83  
pp 13-27

BRONSHTEYN, I. B. and KAFIANI, K. A., Institute of Molecular Biology,  
USSR Academy of Sciences, Moscow

[Abstract] Genetic recombination represents an exchange and redistribution process of hereditary information. Recombination of two DNA-molecules is the basis for a variety of genetic phenomena such as conjugation, transformation, transduction, inversion, translocation, duplication, deletion, etc. This paper represents a review of enzyme and protein properties capable of altering secondary and tertiary DNA structures. Three classes of proteins

were considered: 1) proteins destabilizing the double helix, 2) DNA-dependent ATP-ases catalyzing DNA chain separation and 3) topoisomerases, enzymes which lead to topologic isomerization of DNA molecules. Most of the cited examples reflected data obtained in the in vitro systems consisting of purified model substrates and more or less purified proteins and enzymes, so that on occasions proteins could be isolated even from mutant cells incapable of in vivo recombination. Figures 2; references 130: 3 Russian, 127 Western.  
[384-7813]

UDC 577.151:577.123

#### EUKARYOTE DNA-TOPOISOMERASES: PROPERTIES AND POSSIBLE FUNCTIONS

Moscow USPEKHI SOVREMENNOY BIOLOGII in Russian Vol 96, No 1 (4), July-Aug 83  
pp 28-45

TERESHCHENKO, O. D. and KHAYDAROVA, N. V., Institute of Molecular Genetics,  
USSR Academy of Sciences, Moscow

[Abstract] DNA-topoisomerases are enzymes responsible for interconversion of topologic DNA isomers. Basically there are three types of topologic isomers of DNA: closed circles which twist around, forming a double helix (they can exist in relaxed or superspiralized states), closed molecules with identical base sequences but different number of twists and separate circles linked like chains. All of these DNA conversions can be performed by one class of enzymes: DNA-topoisomerase. Reactions catalyzed by DNA-topoisomerase are based on a unified system: break-recombination of DNA chains. In this paper, basic forms of DNA-topoisomerases are reviewed along with their mechanism of formation. DNA-topoisomerases of the type I and II are listed and their principal chemical and catalytic properties are discussed. The role of these enzymes in replication, transcription and recombination processes in eukaryotic cells is discussed. In all these reactions, the superspiralization of DNA is considered, since superspiralized DNA molecules possess a higher level of free energy than the relaxed molecules. References 161: 6 Russian, 155 Western.  
[384-7813]

## HUMAN FACTORS

UDC: 53.085.345:331.015.11

### ERGONOMIC ANALYSIS OF HUMAN OPERATION OF VIDEO TERMINAL

Moscow PRIBORY I SISTEMY UPRAVLENIYA in Russian No 7, Jul 83 pp 6-7

BONDAROVSKAYA, V. M., candidate of psychological sciences

[Abstract] An ergonomic analysis of video terminal systems indicated that designers pay maximum attention to facilitating the manual aspect of the work of video terminal operations, while attempting to show the maximum possible amount of information on the screen at all times, frequently providing information not related in any way to the actual work performed by the operator. The activity of the users of a number of editing systems was studied and fatigue was observed in 70% of cases after 2 hours of work. Recommendations were developed for improving the organization of labor of terminal users, including arrangement of information on the screen in a manner convenient for reading and for location of fragments of text rather than as a continuous sequence of characters, reduction in the quantity of information presented at one time, adjustment of computer response time to the user in accordance to the structure of the activity presently being performed, and provision of a reaction by the computer to virtually every action by the operator. Five to 10 minute breaks are recommended each 2 hours of work. Figure 1; references 4 (Russian).  
[287-6508]

UDC: (53.085.345:331.015.11).001

### RESULTS OF PSYCHOPHYSIOLOGICAL STUDY OF VIDEOTON TERMINAL OPERATORS

Moscow PRIBORY I SISTEMY UPRAVLENIYA in Russian No 7, Jul 83 pp 7-8

LIKHACHEVA, O. A., STEPANOVA, L. P. and KHUKHLAYEV, V. K., engineers

[Abstract] Studies were performed using a combination of methods including measurement of critical blinking frequency, reaction to sound, endurance and strength of the hands in order to determine the basic properties of the

central nervous system during work with the "Videoton" computer terminal. Subjects were 18 to 33 years of age and had been working with the terminal for one month to 6 years. The symptoms uncovered indicate a strong specific influence of the types of labor performed, on the human body. Operator fatigue, headache and other symptoms were found to be characteristic of CRT terminal workers, increasing greatly with an increase in the information load. However, the study cannot answer whether the specific source of these unpleasant sensations is the hardware itself, the blinking of the signal characters, the density of information on the screen or something else. Systematic vision testing is recommended as a qualifying step for employment as a CRT operator. Psychological testing is also required to select persons suitable for work with computer equipment.  
[287-6508]

UDC 621:658.5.011.54/56

#### REALIZATION OF HUMAN WORK CAPACITY: INTERDISCIPLINARY PROBLEMS

Kiev VISNYK AKADEMIYI NAUK UKRAYINS'KOYI RSR in Ukrainian  
No 1, Jan 84 pp 25-33

MAR'YENKO, B. S., doctor of medical sciences, KOPYSTYANSKAYA, K. R.,  
candidate of psychological sciences and TITOVA, N. A., candidate  
of economical sciences

[Abstract] The problem of the most rational approaches to utilizing human work capacity to the fullest is discussed from the psychophysiological and organizational viewpoints. In addition to the rather obvious means relying on physiological and psychological testing of applicants for a position to determine their suitability, factors such as creating favorable work environments and rational work assignment and management are also extremely important. Optimum production and productivity can only be expected when all the factors pertinent to a given work situation are scientifically analyzed and evaluated. This also implies the need for periodic reassessment of both the health and attitudes of the workers, and of the changing job requirements.  
[512-12172]

STRESS IN WORK

Moscow USPEKHI FIZIOLOGICHESKIKH NAUK in Russian Vol 15, No 1, Jan-Feb 84  
pp 76-99

SMIRNOV, K. M., All-Union Scientific Research Institute of Labor Safety,  
Leningrad

[Abstract] Labor physiology concerns itself with the state and activity of the human body during performance of some work. Concepts, terminology and general ideas of labor physiology are defined in the introduction to this review paper, in an attempt to draw some distinction between stress and strain. Work strain is then discussed in terms of general physical labor, local physical effort and nonphysical exertion. The effect of the environment and the cumulative effect of multiple factors on human performance are addressed. Evaluation criteria and possible normalization of labor stress are addressed in a separate subtopic. Data on labor stress and strain represent an important component of the knowledge of human physiology and should be taken into account in hygienic and ergonomic evaluations and in analyses of productivity.

References 149: 98 Russian (1 by Western author), 51 Western.

[442-7813]

UDC 579.843.95+579.842.23].083.137

TEST PROCEDURES FOR DIFFERENTIATING BETWEEN PLAGUE AND PSEUDO-TUBERCULOSIS CULTURES

Moscow LABORATORNOYE DELO in Russian No 21, Dec 83 pp 39-41

ADAMOV, A. K., KOROVKIN, S. A. and NAUMOV, A. V., All-Union Scientific Anti plague Research Institute "Mikrob," Saratov

[Abstract] In an attempt to improve laboratory diagnosis of plague, aqueous formaldehyde was substituted for the normally-used alcohol or hydrocarbon solvents. The following method was recommended: aqueous formaldehyde is added to test culture so as to get a  $2-4 \times 10^{-3}\%$  concentration and the solution is incubated at  $37^{\circ}\text{C}$ . After 3, 6 and 24 hrs the degree of formalin oxidation is tested with fuchsin sulfurous acid color reaction. Strains that oxidize the formalin represent antituberculosis pathogens; those that fail the oxidation test are plague pathogens. References 7 (Russian).  
[484-7813]

UDC 615.371:578.833.26].015.44:616.155.33

IN VITRO ASSESSMENT OF IMMUNE BARRIER FUNCTION OF MOUSE MACROPHAGES FOLLOWING VACCINATION WITH TICK-BORNE ENCEPHALITIS VIRUS

Moscow ZHURNAL MIKROBIOLOGII EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 12, Dec 83 (manuscript received 24 Jan 83) pp 57-60

KARASEVA, P. S. (deceased), KHOTLUBEY, L. I., EL'BERT, L. B., KHOZINSKIY, V. V. and SEMENOV, B. F., Institute of Poliomyelitis and Viral Encephalitides, USSR Academy of Medical Sciences, Moscow

[Abstract] Several strains of mice were employed to study the immune barrier function of peritoneal macrophages with respect to two Flaviviruses which differ in virulence: tick-borne encephalitis virus (TBEV) and Langat virus. In vitro studies demonstrated that both viruses

multiplied to an equal extent in the peritoneal macrophages derived from TBEV-susceptible mouse lines (C57Bl and AKR) and from TBEV-resistant mouse lines (BALB/c, CBA and F<sub>1</sub>(CBA x C57Bl)). Similar results were obtained with the macrophages obtained from mice that had been immunized with TBEV. These observations demonstrate that in the case of the Flaviviruses and the mouse lines employed the macrophages do not constitute an effective defense system either in the immunized or unimmunized mice: both the virulent and the avirulent viruses can overcome the macrophages. Figures 2; references 12: 4 Russian, 8 Western.  
[401-12172]

#### ENZYMATIC ACTIVITY OF PLAGUE EB VACCINE

Moscow ZHURNAL MIKROBIOLOGII EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian  
No 12, Dec 83 p 90

SHPILEVAYA, E. G., TINKER, A. I., KHAR'KOVA, N. M., GONCHAROVA, M. N.  
and VASIL'YEVA, Z. I., Stavropol; Irkutsk

[Abstract] Biochemical studies were conducted on plague EB vaccines produced in Stavropol and Irkutsk to evaluate their physiological status after drying in the presence of glutamine or thiourea as stabilizing agents. Analysis of enzymatic activities representative of oxidative, carbohydrate and phosphate metabolism showed that drying under the conditions employed did not affect the metabolic status of the vaccines. However, lyophilization did diminish to a statistically significant degree the activity of 2,3,5-triphenyltetrazole chloride reductase with respect to NAD-dependent components of the TCA, without affecting the other systems tested. The effects of lyophilization may have either been due to the effects of anabiosis or to death of a fraction of the population.  
[401-12172]

#### PREPARATION AND PROPERTIES OF YERSINIA PESTIS L-FORMS

Moscow ZHURNAL MIKROBIOLOGII EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian  
No 12, Dec 83 pp 93-94

STAPANOV, V. M. and UZBEKOV, B. K., Alma Ata

[Abstract] Previously described methods, not requiring the presence of penicillin, were used for the L-transformation of six strains of *Y. Pestis*. *Y. pestis* differs from other bacteria during L-transformation in that intermediate thread-like forms are not formed, while the L-forms themselves were transparent and some grew into the semisolid medium. In distinction to the cell-wall forms, the L-form showed late carbohydrate



fermentation, weak urease and coagulase activities, and did not possess fibrinolytic activity. In addition, the L-forms contained very little fraction I antigen and elevated concentrations of calcium and phosphorus. The L-forms were also characterized by lower virulence for guinea pigs and gerbils.  
[401-12172]

UDC 615.371:579.843.94:579.253

L-TRANSFORMATION OF YERSINIA PESTIS EB VACCINE STRAIN IN DIFFUSION CHAMBER

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian  
No 1, Jan 84 (manuscript received 20 Apr 83) pp 113-114

SAYAMOV, S. R., Volgograd Scientific Research Anti-Plague Institute

[Abstract] In order to determine the factors that may lead to L-transformation of *Y. pestis* EB within a host, diffusion chamber studies were conducted in which chambers containing the bacteria were implanted into the peritoneal cavity of immune and nonimmune guinea pigs. Electron microscopy and cultivation studies on chambers removed after 14 days, 1 month and 4 months demonstrated that with time the number of L-forms increased. L-forms were observed in both the immune and nonimmune animals, and this fact indicates that certain humoral factors other than antibodies may also induce L-transformation of *Y. pestis*.  
[402-12172]

UDC 616.98:579.841.11.083.3

IDENTIFICATION OF STRUCTURAL ANTIGENS OF PSEUDOMONAS PSEUDOMALLEI  
BY TWO-DIMENSIONAL IMMUNOELECTROPHORESIS

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian  
No 1, Jan 84 (manuscript received 9 Feb 83) pp 62-65

ALEKSEYEV, V. V., KALEY, G.M. and LOKTINIONOV, A. M. (deceased), Volgograd Scientific Research Anti-Plague Institute

[Abstract] Two-dimensional immunoelectrophoresis was employed in studies on the structural antigens of *Pseudomonas pseudomallei* following disruption of the cells by x-press (LKB, Sweden). The combination of the immunological and electrophoretic techniques led to the identification of a number of common and specific antigenic determinants among the cytoplasmic cell-wall and flagellar fractions. In general, the antigenic composition was similar to other gram-negative bacteria. Among specific antigens

noticeable were a thermostable cell-wall antigen with cathodal mobility, cytoplasmic protein antigens, a thermolabile H antigen and a thermostable flagellar antigen. Two-dimensional immunoelectrophoresis was thus shown to be capable of identifying structure-specific antigenic components and also to be a technique that could be used to follow the purity of structural isolates. Figures 2; references 8: 7 Russian, 1 Western. [402-12172]

UDC 615.373.3:579.843.1]+615.373.3:579.842.14].07

EXPERIMENTAL CONFIRMATION OF EFFICACY OF COMBINED SUBCUTANEOUS IMMUNIZATION AGAINST CHOLERA AND TYPHOID FEVER

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian № 1, Jan 84 (manuscript received 12 Jan 84) pp 85-89

GAPOCHKO, K. G., YEMEL'YANOVA, O. V. and ZYABLITSEV, I. F.,  
Military Medical Academy imeni S. M. Kirov, Leningrad

[Abstract] Serologic studies were conducted on white mice and guinea pigs to determine the effectiveness of typhoid vaccine administered subcutaneously either by syringe injection or a jet injector, as well as the reactogenicity and safety of combined typhoid and cholera vaccine administration. Studies on guinea pigs demonstrated that, administered in either way, the chemically adsorbed typhoid vaccine was equally effective in inducing antibody formation. Combination of the two vaccines and jet injector administration showed that the combinations were essentially areactogenic, except for some minor local hyperemia and infiltration, and effective in both species. The only apparent histological changes consisted of the expected degree of lymphatic hyperplasia, which was consonant with the immune response. On the basis of the animal experiments, the combination of typhoid vaccine and cholera toxoid can be recommended for human trials. [402-12172]

DETERMINATION OF OPTIMUM IMMUNIZING DOSE OF INACTIVATED JAPANESE  
ENCEPHALITIS VACCINE

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian  
(manuscript received 13 Jan 83) pp 98-103

GRACHEV, V. P., SUMAROKOV, A. A., KHARAZYAN, E. B., SHKOL'NIK, R. Ya.,  
KARINSKAYA, G. A., VOROB'YEVA, M. S., GAGARINA, A. V., EL'BERT, L. B.,  
LAKINA, V. I., PERVIKOV, Yu. V., BORSUK, E. A., KARASEVA, P. S. (deceased),  
LEV, M. I., KUZNETSOV, V. G., OSTAPENKO, V. D., LOSKUTOV, A. N.,  
GREBENSHCHIKOV, L. A. and NIKONOVA, V. A., State Scientific Research Institute  
of Standardization and Control of Medical Biological Preparations  
imeni L. A. Tarasevich; Institute of Poliomyelitis and Viral Encephalitides,  
USSR Academy of Medical Sciences, Moscow

[Abstract] Clinical trials were conducted on the human effectiveness of an  
inactivated, liquid Japanese encephalitis vaccine (JEV), employing 436 im-  
munized individuals and 117 control subjects injected subcutaneously with  
physiologic saline. Antibody formation was followed by passive hemagglu-  
tination and neutralization tests. The results showed that a high level  
of immunity was generated, which persisted for at least two months, which  
indicated that reimmunization prior to seasonal outbreaks should provide  
sufficient protection against Japanese encephalitis. The optimum immuni-  
zation scheme was found to consist of subcutaneous administration of  
1.5 ml doses of JEV at days 0, 10 and in one year. References 6 (Russian).  
[402-12172]

## LASER EFFECTS

### LASERS BOOST AGRICULTURAL YIELD

Alma Ata KAZAKHSTANSKAYA PRAVDA in Russian 29 Feb 84 p 1

[Article by S. Burdin, chairman of Wolkhoz imeni Lenin and Hero of Socialist Labor; V. Inyushin, director of the Biofizika Association and professor at Kazakh State University imeni S. M. Kirov; G. Il'yasov, candidate of biological sciences and docent of Kazakh State University: "Lasers As Helpers. Quantum Agrotechnology Is the Key to High Yields"]

[Excerpt] Scientific discoveries of the past few years have found another way to increase the productivity of agricultural crops. It is laser agrotechnology--that is, the use of quantum-mechanical oscillators to raise the biophysical potential of plants. Lasers first began to be used in Alma-Ata Kolkhoz in Talgarskiy Rayon. Practical testing of the first lasers yielded a high effect.

Biophysicists at Kazakh State University proposed an agricultural technology which was new for that time--laser technology. It is based on the phenomenon of photon or light pumping of the living cells of plants. It is most effective when the ultra-pure radiation of lasers is used.

Photon pumping is one of the ways to increase the bioenergetic reserves of seeds, which ultimately has an effect on the ability of plants to assimilate solar energy and resist unfavorable factors--drought, low temperatures, and diseases.

Laser agrotechnology devices developed by scientists are now being used and are yielding more than 150,000 rubles of profit per year to Kolkhoz imeni Lenin--chiefly due to shortening the times of crop maturation by 9-12 days and increasing productivity by 3-6 quintals per hectare. Each ruble spent by the kolkhoz to introduce laser agrotechnology is yielding more than 3 rubles of profit.

Laser facilities are being used to treat seeds of soy bean, winter wheat, corn, and also their sowings. The seeds thus obtained yield more uniform and stronger shoots. Then, their growth is activized by treatment in the period of mass flowering and by watering with irradiated water. Activated water promotes accelerated oxidation-reduction

processes in the soil, and preserves its structure and fertility. In addition, it boosts the activity of nitrogen fixers and improves plants' assimilation of mineral fertilizers.

The kolkhoz has constructed an agrotechnical station on the irrigation canal, equipped with laser units for activating water. Its productivity is more than 10 cubic meters per second. The units work 24 hours a day. Laser technology has become an integral part of the agricultural equipment used on the kolkhoz for the cultivation of agricultural crops. It has now been introduced and is giving good results on many farms of Taldy-Kurgan, East Kazakhstan, and Turgay oblasts, and also on a number of kolkhozes in Lvov Oblast and the Belorussian SSR. Kolkhoz imeni Lenin has arranged a demonstration of laser-based agricultural devices for specialists of Talgarskiy Rayon.

But it is still being adopted too slowly. The use of lasers in agricultural production is being held back by an insufficiency of specialists--biophysicists and agronomists--who can work with laser facilities. A startup and maintenance service also has yet to be organized. We believe it has become necessary to create a branch laboratory of biophysics within the facilities of the Kolkhoz imeni Lenin, and also a rayon production center for laser-based agricultural technology. It will then be possible to organize the training of specialists. Help in creating such a center could be provided by the Kazakh Ministry of Agriculture and Ministry of Higher and Secondary Specialized Education.

12255

CSO: 1840/488

## LASERS AGAINST ULCERS

Moscow SOVETSKAYA KUL'TURA in Russian 25 Feb 84 p 2

IODKOVSKIY, E., Moscow

[Abstract] A copper-vapor laser has been developed at the Central Scientific Research Institute of Gastroenterology for the treatment of gastric ulcers by endoscopic application. The laser was developed through the joint efforts of clinicians and physicists and has been successfully used in the management of some 29 patients to date. Generally, the ulcer heals completely within a two weeks time. Further improvements in this mode of treatment will come from a better understanding of all the parameters that characterize such lasers, but none of them can compete with the most effective means of preventing such problems through better self-management. The Institute, which is located on the Choussee of Enthusiasts, is directed by A. S. Loginov, corresponding member USSR Academy of Medical Sciences.  
[489-12172]

UDC 615.849.19.015.4.07

## ANALYSIS OF SOME ASPECTS OF MECHANISM OF ACTION OF HELIUM-NEON LASER RADIATION

Moscow VOPROSY KURORTOLOGII, FIZIOTERAPII I LECHEBNOY FIZICHESKOY KUL'TURY in Russian No 6, Nov-Dec 83 (manuscript received 6 July 82) pp 25-29

ZUBKOVA, S. M., SOKOLOVA, Z. A., POPOV, V. I. and LAPRUN, I. B., Central Scientific Research Institute of Health-Resort Science and Physiotherapy, Moscow

[Abstract] An attempt was made to elucidate the action of laser radiation on enzymatic and free radical oxidation, structural and functional state of mitochondrial membranes and nuclear chromatine, RNA and glycogen content, morphometric cell factors, etc. Experiments were performed on male Wistar rats. It was shown that laser radiation has a stimulating effect on metabolic processes directly in the irradiated tissue as well as in CNS, as shown by activation of energetic and plastic processes and by lowered free radical oxidation rate. General x-ray radiation led to destructive changes in the tissues studied. Preexposure to laser rays showed some protective effect in the directly irradiated tissue. Comparison of laser radiation with incoherent red light showed greater metabolic changes occurring after exposure to laser beam. Figure 1; references 7: 5 Russian, 2 Western.  
[462-7813]

USE OF LASER THERAPY ON PATIENTS WITH TROPHIC ULCERS AND LONG TIME UNHEALING WOUNDS IN PREPARATION FOR PROSTHESES

Moscow VOPROSY KURORTOLOGII, FIZIOTERAPII I LECHEBNOY FIZICHESKOY KUL'TURY in Russian No 6, Nov-Dec 83 (manuscript received 20 Apr 83) pp 29-32

KLIMOVSKAYA, M. P. and MEL'NIKOVA, A. P., Scientific Research Institute of Prosthesis and Central Scientific Research Laboratory of Leningrad Institute for the Advanced Training of Physicians

[Abstract] Preparing patients with defects in their limbs for prosthesis, laser therapy was performed on unhealing wounds and ulcers; an evaluation was made of the effectiveness of this procedure on the basis of the general state of patients, blood readings and histologic examinations. The helium-neon laser LG-75 used generated radiation at a wavelength of 632.8 nm with 20 mW initial power and target to source distance of 80 cm. Excellent results were obtained in 85% of study patients and adequate results in the remaining 15%. Thus, it was shown that laser therapy is helpful in cases of long-lasting unhealing wounds and ulcers. Laser therapy improves the general state of the patients, acts as an analgesic and normalizes the blood indices. No complications were noted. Morphologic examination showed accelerated regenerative processes taking place in the treated wounds. Figures 2; references 8: 6 Russian, 2 Western. [462-7813

EFFECTIVENESS OF CYTOGENETIC AND MUTAGENIC ACTION OF PULSED AND CONTINUOUS LASER RADIATION OF WHEAT AS FUNCTION OF RADIATION PARAMETERS

Minsk VESTSI AKADEMII NAVUK BSSR in Belorussian No 1, Jan 83 (manuscript received 15 Jul 82) pp 17-20

KHOKHLOVA, S. A., MOSTOVNIKOV, V. A., KHOKHLOV, I. V. and KHOTYLEVA, L. V., Institute of Genetics and Cytology, BSSR Academy of Sciences, Institute of Physics, BSSR Academy of Sciences

[Abstract] Genetic transformation is a common phenomenon among microorganisms both under natural and experimental conditions. Studies of genetic transformations in plants began much later than in animals. In the present paper, experimental results were reported of the cytogenetic and mutagenic effect of pulsed and continuous laser irradiation on wheat sprouts and seeds. The vectors studied included the irradiation dose, wavelength, density and power of radiation. The relationship of cytogenetic effect to the radiation dose was nonlinear. Mutagenic

transformations of the plants whose seeds were irradiated, prior to planting, with a 450-650 nm laser beam intensified as the radiation proceeded from the long wavelength toward the short wavelength. Figures 2; references 6 (Russian).  
[394-7813]

UDC 616.5-006.881-08:615.819.1:611.77-018.1

REACTION OF FREE STROMAL CELLS OF SKIN AFTER PULSED LASER IRRADIATION  
OF MELANOMA

Moscow VOPROSY ONKOLOGII in Russian Vol 19, No 9, Sep 83  
(manuscript received 15 Sep 82) pp 11-15

MOSKALIK, K. G., Order of the Labor Red Banner Scientific Research Institute of Oncology imeni professor N. N. Petrov, USSR Ministry of Health, Leningrad

[Abstract] Study of the quantitative composition and ratio of free stromal cells of the skin after treatment of melanoma by pulsed laser radiation involved grafts of melanoma B-16 under the skin of the right rear paw of C57B1 mice and irradiation of the tumors by a single pulse of neodymium laser radiation when they were 5-8 mm in diameter. The number and ratio of free stromal cells were studied 1 hour, 1, 2, 3, 5 and 12 days after irradiation of the melanoma. Irradiation increased the number of free stromal cells and changed their ratio with a shift to accumulation of lymphocytes and macrophages and an increase of the number of leukocytes with degranulation of mast cells cytoplasm. Development of lymphoid-histocytic infiltration denotes an immune reaction of the organism to the change of antigenic properties of the tumors and normal tissues after irradiation and indicates an increase of local immunological protection. Figures 3; references 16: 11 Russian, 5 Western.  
[478-1791]

UDC 618.19-006.6-076:615.849.19

LASER FLOW CYTOMETRY IN FIBROCYSTIC BREAST DISEASE AND BREAST CANCER

Moscow LABORATORNOYE DELO in Russian No 9, Sep 83  
(manuscript received 9 Jul 82) pp 16-18

BOGATYREV, V. N., KUPIN, V. I. and POLEVAYA, Ye B., All-Union Oncologic Scientific Center, USSR Academy of Medical Sciences, Moscow

[Abstract] Laser flow cytometry was used in the examination of cells obtained from 34 patients with fibrocystic breast disease and breast cancer (stage II). In the fibrocystic disease most of the cells were in phase G<sub>0</sub>+G<sub>1</sub>, and the number of proliferating cells was small. Examination



of the cells from the malignant tissues showed that the RNA and DNA histograms were remarkable for an increase in the number of cells in phases  $G_1$ , S, and  $G_2+M$  vis-a-vis the fibrocystic tissues. Immunologic assessment of both categories of patients revealed depression of T-cell rosette formation and of serum levels of IgG and IgM. References 7: 2 Russian, 5 Western.  
[418-12172]

UDC 616.133-089.86]-092.9

COMBINED METHOD FOR ESTABLISHING EXTRA-INTRACRANIAL MICROVASCULAR  
ANASTOMOSES USING BIOADHESIVES: EXPERIMENTAL AND CLINICAL STUDIES

Moscow VOPROSY NEYROKHIRURGII in Russian No 6, Nov-Dec 83  
(manuscript received 24 Feb 81) pp 19-25

AKSIK, I. A., Neurosurgical Center, Republic Hospital imeni P. Stradynya,  
Riga

[Abstract] Following experimental confirmation on the effectiveness of a fibrinogen-thrombin bioadhesive in maintaining patency of vascular anastomoses in rabbits, end-to-side anastomoses were carried out in 54 patients using the parietal or frontal branch of the superior temporal artery (or occasionally the occipital artery) and the cortical branch of the middle cerebral artery. The surgical procedure employed four crossed sutures, fibrinogen-thrombin bioadhesive and hemostatic sponges. The bioadhesive was prepared immediately prior to surgery and consisted of 100 mg/ml of fibrinogen and 100 U/ml of thrombin in Ringer's solution with 0.10-0.11 mg%  $Ca^{++}$ . The early postsurgical results in the patients with cerebral ischemia were excellent with patency seen in 3 days in the majority of the patients (92.8%). Angiographic examinations conducted 3 months to a year later showed functional anastomoses in 36 (85.7%) of the patients. The ease and reliability of this approach rely on a minimum of sutures and use of a compatible bioadhesive which minimizes inflammatory changes. Figures 4; references 20: 7 Russian, 13 Western. [412-12172]

## IMMEDIATE EFFECTS OF HYPERBARIC OXYGENATION ON BODY OXYGEN SUPPLY

Moscow ANESTEZIOLOGIYA I REANIMATOLOGIYA in Russian No 1, Jan-Feb 84  
(manuscript received 4 Feb 83) pp 20-21

BURAVTSOV, V. I., TULUPOV, A. N., NIKOLAYEVA, I. P., TATULYAN, S. A. and KOSTYUCHENKO, A. L., Chair of Intramural Surgery, Military Medical Academy imeni S. M. Kirov; Resuscitation Laboratory, All-Union Scientific Research Institute of Pulmonology, USSR Ministry of Health; Physical Chemistry Laboratory of Cell Membranes, Institute of Cytology, USSR Academy of Sciences, Leningrad

[Abstract] Studies were conducted on the effectiveness of hyperbaric oxygenation in the case of 36 patients (37-60 years old) with destructive pulmonary abscesses in improving body oxygen balance. The therapeutic protocol called for 4-6 sessions in a pressure chamber with a  $pO_2$  of 152-183 kPa (1.5-1.8 atm), each session lasting for 30-45 min. Hemodynamic and biochemical studies demonstrated that therapy had no effect on pulmonary gas exchange, but the minute volume was decreased by 32% in patients with an elevated minute volume (hypoxemic conditions). Despite diminished oxygen transport, blood flow and arteriovenous difference in oxygen tension, tissue oxygen balance improved as indicated by decreased serum lactate dehydrogenase activity and increased stability of erythrocyte suspensions and electrophoretic mobility of erythrocytes. These factors were taken to indicate that, following hyperbaric oxygenation, energy expenditures for respiration and circulation are less stringent. References 6: 5 Russian, 1 Western.

[1009-12172]

## ANTICOAGULANT TACTICS IN CONJUNCTION WITH 'SEVER-OMR' MEMBRANE OXYGENATOR

Moscow ANESTEZIOLOGIYA I REANIMATOLOGIYA in Russian No 1, Jan-Feb 84  
(manuscript received 30 Mar 83) pp 21-25

SKORIK, V. I., SAFONOVA, Ye. S., STERNIN, M. O., ZELIKSON, B. M. and MALIKOVA, T. M., Postgraduate Surgical Clinic imeni P. A. Kurpiyanov, Military Medical Academy imeni S. M. Kirov, Leningrad

[Abstract] Summary data are presented on five years of studies on 114 dogs with various hypoxic conditions treated with the "Sever-OMR" membrane oxygenator [B.M. Zelikson et al., 1977]. Of key importance in successful oxygenation is the selection of the appropriate anticoagulant therapy, in particular, the priming dose of heparin, which in dogs is in the 8-10 mg/kg range. The initial dose is of primary importance in preventing

coagulopathy during membrane oxygenation, and anticoagulative therapy during the entire course of oxygenation must be individually controlled and constantly monitored to prevent thrombosis. The latter is particularly important since heparin concentration varies with the duration of oxygenation, temperature conditions, intensity of diuresis, inclusion and exclusion of pulmonary ventilation, blood antithrombin III levels, etc. References 20: 12 Russian, 8 Western.  
[1009-12172]

UDC 579.8.083.134(088.8)(048.)8

REVIEW OF PATENT LITERATURE ON BACTERIAL CULTURE MEDIA

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian  
No 12, Dec 83 (manuscript received 24 Mar 83) pp 22-26

OREL, L. L. and DUBYANSKAYA, L. D., Central Asian Scientific Research Anti-Plague Institute, Alma Ata

[Abstract] An analysis of the patent literature for the USSR (1949-1981), USA and West Germany (1972-1981) demonstrated that most inventions pertaining to bacterial culture media are classed under C12K1/06 of the International Classification of Inventions. Additional information can also be obtained under class C12K 1/00, 1/10, C12B 3/08 and 3/12. Occasionally instructions for medium preparation can be found under C12N 1/20, C12B 3/12 and C08B 3/00, while growth stimulants are entered under C12K 3/00, C12B 1/08, 1/20, 3/02, 3/12, 3/08; C12N 1/38, 13/00, C12d 7/00; and C12Q 1/04. The vast amount of information that is available can be readily divided into three basic categories: a) media preparation, b) growth stimulants, and c) media useful in differential diagnosis. At the present time the fundamental trend in research on the bacterial culture media seems to concentrate on the replacement of the more costly additives, growth factors, and nutrients with less expensive substitutes.

References 53: 41 Russian, 12 Western.

[401-12172]

PREPARATION OF RICKETTSIA PROWAZEKII ANTIGEN BY CULTIVATION IN FL CELLS  
AND ITS USE IN MACROPHAGE MIGRATION INHIBITION TEST

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian  
No 12, Dec 83 (manuscript received 6 Oct 82) pp 46-49

CHERESHKOVA, Ye. A., KEKCHYEVA, N. G., KASHLYAYEVA, T. K.,  
KABANOVA, Ye. A. and VOVK, O. A., Institute of Epidemiology and Microbiology  
imeni N. F. Gamaleya, USSR Academy of Medical Sciences, Moscow

[Abstract] Conditions are described for the cultivation of Rickettsia  
prowazekii in a culture of human amnion FL cells in medium 199 supplemented  
with lactalbumin and hydrocortisone. Following cell disruption and release  
of the rickettsia, the rickettsial suspension was treated with a two-fold  
excess of ether, and the aqueous layer employed as the antigen preparation.  
The antigen preparation was found suitable for CF tests and effective in  
macrophage inhibition tests employing guinea pig peritoneal macrophages  
derived from immunized animals. The effects of hydrocortisone in enhancing  
infectivity and antigen production was ascribed to its stabilizing effects  
on lysosomal membranes; consequent to this, the microorganisms were not  
subject to destruction by the hydrolytic lysosomal enzymes. References 6:  
3 Russian, 3 Western.  
[401-12172]

UDC 576.859.9

NEW MARKER EFFECT OF INTRAGENIC RECOMBINATION IN SACCHAROMYCES CEREVISIAE

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 274, No 3, Jan 84  
(manuscript received 39 Jun 83) pp 716-719

GORDENIN, D. A. and CHERNOV, Yu. O., Leningrad State University  
imeni A. A. Zhdanov

[Abstract] Details are presented on genetic studies in Saccharomyces  
cerevisiae which resulted in the detection of a novel marker effect,  
consisting of an increase in the frequency of reciprocal recombinant  
products in spontaneous mitotic recombination of deletion mutants in  
gene LYS2. The studies were conducted with two pairs of mutants affecting  
the LYS2 gene: point mutations lys2-11 and lys2-18 and nonoverlapping  
deletions lys2-22 and lys2-25. Mitotic recombination gave diploids  
containing one wild-type allele, while the other allele contained either  
a single or a double mutation. Double mutations were detected in low  
frequencies (3%) among the point mutation recombinants, and by an order  
of magnitude in greater frequencies (24%) among the deletion mutant  
recombinations. This observation is particularly interesting since

the 22 and 25 deletions recombine less frequently than the point mutations 11 and 18. The high frequency of double mutations corresponding to reciprocal recombination represents a unique feature in the case of intragenic mitotic recombinations in yeasts. Figures 2; references 13: 3 Russian, 10 Western.  
[329-12172]

UDC 615.919:579.842.15].015.4:616.8].015.46

# COMPARATIVE ANALYSIS OF IMMUNOGENICITY OF SHIGELLA SONNEI PHASE I AND II NEUROTOXINS AND THEIR FRACTIONS

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian  
No 1, Jan 84 (manuscript received 16 Feb 83) pp 23-26

KAMZOLKINA, N. B. and YAROVAYA, L. M., Moscow Scientific Research Institute of Epidemiology and Microbiology imeni G. N. Gabrichevskiy

[Abstract] Neurotoxins derived from *Shigella sonnei* phase I and II cultures were analyzed for immunogenicity by ocular application in outbred guinea pigs and by subcutaneous injections into albino mice, followed by infection of the animals with a virulent *Sh. sonnei* culture 10-12 after immunization. Similar studies were conducted with fractions of the neurotoxins obtained by gel filtration on Sepharose 4B and Sephadex G-50, and ultrification via Vladipor UAM-500, UAM-100, and UAM-50 filters. The neurotoxin and its fractions that were derived from phase II bacteria were weakly immunogenic and did not protect the animals against infection with a virulent strain, in comparison with the immunogenicity displayed by the toxin and its fractions derived from the phase I culture. The greatest immunogenicity was displayed by the first high-molecular weight fraction derived with Sepharose 4B from the phase I neurotoxin. The immunogenicity of this fraction was due to the admixture of endotoxin and, in a greater degree, to other nontoxic antigens. This observation suggests that it may be possible to isolate the latter antigens in pure form from phase I *Sh. sonnei*. References 6: 5 Russian, 1 Western.  
[402-12172]

## EFFECTS OF STORAGE TEMPERATURES ON LEPTOSPIRAL BIOLOGICAL PROPERTIES

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian  
No 1, Jan 84 (manuscript received 17 Mar 83) pp 38-42

SOBOLEVA, G. L., MALAKHOV, Yu. A., BELOUSOV, V. I. and SHMARIKOVA, T. V.,  
All-Union State Scientific Control Institute of Veterinary Preparations,  
USSR Ministry of Agriculture, Moscow

[Abstract] Extensive studies were conducted over a four-year period on the effects of storage temperatures on the biological properties of leptospiaras kept in serum-enriched medium for that time either at -60 to -70°C or at room temperature (18-24°C). Storage at -60 to -70°C for 4 years had no effects on agglutination titers, but the titers of cultures stored at room temperature decreased two- to eight-fold. Storage under both temperatures showed retention of 100% viability after two years, and a fall to 95.75 and 78.59% viability for the -60 to -70°C samples after 3 and 4 years, respectively, and a corresponding decrease to 90.90 and 70.00% for the room temperature specimens. Tests on virulence after two years of storage showed no change, in the LD<sub>50</sub> for golden hamsters, of strains preserved at -60 to -70°C (42.3±13.4 microbial cells), but a five-fold decrease was seen in the specimens stored at room temperature for two years (LD<sub>50</sub> = 196.7±94.0 cells). References 11: 5 Russian, 6 Western.  
[402-12172]

UDC 579.842.1/.2:651.919.076.7

## ESCHERICHIA COLI TOXINS: COMPARATIVE CHARACTERISTICS

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian  
No 1, Jan 84 (manuscript received 16 Feb 83) pp 56-60

SMIRNOVA, L. A., Leningrad Institute for the Advanced Training of Physicians  
imeni S. M. Kirov

[Abstract] Comparative evaluation was conducted on the characteristics of endo-, neuro- and enterotoxins of E. coli strains, including a human pathogen capable of inducing cholera-like dysentery. Comparison of the results obtained with enterotoxigenic and nontoxigenic strains demonstrated quantitative differences in polysaccharides and RNA, as well as in lethality for albino mice injected intraperitoneally. Polyacrylamide-gel disc-electrophoresis of the toxins from the nonpathogenic and highly virulent strains of E. coli revealed pronounced differences in the protein and polysaccharide fractions in terms of concentration and electrophoretic mobility of the dominant fractions. It also appears that further differentiation of E. coli toxins can be based on the identification of "specific" protein and polysaccharide fractions. Figures 2; references 15: 8 Russian, 7 Western.  
[402-12172]



## MILITARY MEDICINE

UDC 616.33/.34-005.1:617.51+616.831]-001.4:355

### GASTROINTESTINAL HEMORRHAGE IN ACUTE CRANIOCEREBRAL TRAUMA RESULTING FROM COMBAT IN LEBANON

Kiev VRACHEBNOYE DELO in Russian No 6, Jun 83  
(manuscript received 9 Dec 82) pp 90-91

ABDERAKHMAN, SAID, Chair of Neurosurgery, Donetsk Medical Institute

[Abstract] Treatment protocols are presented for 11 cases of massive gastrointestinal bleeding (up to 3 liters; melena 5-6 times a day) out of 200 cases of gunshot wounds seen recently in Lebanon. The patients with gastrointestinal bleeding were primed with 20-30 mg of dexamethasone, followed by 32 units of this drug on the same day and continued for 8 days in decreasing dosage. Children with gastrointestinal hemorrhage received 16 mg of dexamethasone according to the same protocol. The onset of bleeding in 6 patients 10-16 years old was seen in 3-5 days after the head injury, and 4-10 days in the 5 adult cases. The duration of hemorrhage was for 36-48 h, with 5 patients succumbing in 2-3 days. All patients were managed conservatively with surgery, blood replacement, coagulants, cold gastric lavage, antacids, and autonomic blockers. Gastrointestinal hemorrhage is not an infrequent complication of head trauma resulting from stress-induced peptic ulcer.  
[415-12172]

UDC 582.28:678.7

### FUNGI INFESTING POLYMER MATERIALS

Leningrad MIKOLOGIYA I FITOPATOLOGIYA in Russian Vol 16, No 5, 1982  
(manuscript received 18 Mar 82) p 414-419

KOVALEVA, S. Ye., GRISHKAN, I. Ye. and IVANOVA, A. M., Botanical Institute imeni V. L. Komarov, USSR Academy of Sciences, Leningrad

[Abstract] Fungal biodestruction has in recent years become a factor in polymer life and environmental protection. The present article reports on studies of cotton, polyamide, polyimide, tetrafluorethylene, polyethylene

pterephthalate, silicon and fiberglass, PVC and phenyl compositions under the effects of some 70 species of Zygomycetes, Ascomycetes, Dematiaceae and other genera. Of these, 45 were incomplete fungi, largely of *Penicillium* and *Aspergillus* genera, which adapted well and bore spores on many tested materials. Fungi were especially acclimated to cotton-base, capron, arimide and tetrafluoroethylene polymers. On the other hand, none were encountered on silicon, synthetic rubber or fiberglass materials. Certain penicillins and spergills developed new characteristics of outward form and spore production on polymers. On the other hand, hyphomycetes showed great stability in these artificial environments. References 16: 13 Russian, 3 Western.  
[433-12131]

# NONIONIZING ELECTROMAGNETIC RADIATION EFFECTS

UDC 615.846:616-008.922.1:616.61-06

## DOSE-EFFECT RELATIONSHIPS OF SHF FIELD ON RENAL MORPHOLOGY AND FUNCTION

Kiev VRACHEBNOYE DELO in Russian No 3, Mar 83  
(manuscript received 16 Aug 82) pp 109-111

BELOKRINITSKIY, V. S. and GRIN', A. N., Laboratory of Biohygienic Studies,  
Kiev Scientific Research Institute of General and Communal Hygiene  
imeni A. N. Marzeyev

[Abstract] Histochemical, histological and functional studies were conducted on the kidneys of rats exposed to various doses of SHF field (50-500  $\mu\text{W}/\text{cm}^2$ ; 12.6 cm wavelength) for 7 h per day for 10 days. Low dose irradiation induced minimal biochemical and histological changes which were fully reversible within 30 days; at no time was diuresis affected. Irradiation with 500  $\mu\text{W}/\text{cm}^2$  dose reduced diuresis by 39% on the day following first exposure, with oliguria persisting to day 25. Other changes included vasodilation, small hemorrhages, increased activities of succinate and malate dehydrogenases, increased fatty infiltration, alterations in nuclear size and staining, proteinuria, glycosuria, etc. Certain of these changes persisted for more than 25 days. Exposure of the rats to the higher dose after they had been exposed to the lower dose 30 days previously resulted in less remarkable changes than seen in the animals exposed only to the higher dose and, in addition, there was no proteinuria or glycosuria. It appears that in this situation low dose SHF field exposure enhanced adaptive renal mechanisms to this physical challenge. References 13 (Russian).  
[417-12172]

MAGNETOTHERAPY IN COMPREHENSIVE TREATMENT OF AILMENTS OF TEMPLE,  
LOWER JAW JOINTS

Tashkent MEDITSINSKIY ZHURNAL UZBEKISTANA in Russian No 6, Jun 83  
(manuscript received 22 Jun 82) pp 66-67

MAZALOVA, N. N. and AGZAMKHODZHAYEVA, Kh. A., Department of Surgical  
Stomatology, Tashkent Order of Labor's Red Banner Medical Institute

[Abstract] Numerous reports on beneficial treatments of various ailments with various magnetic fields through physicochemical changes in biological tissues affecting enzymes, permeability and oxidation reactions have not indicated dosages for stomatological ailments. The authors used 15-minute sessions at 50 Hz and 40 oersted units to 28 patients suffering arthritic or arthroso-arthritic ailments of the temple and lower jaw. The patients' amneses showed prior influenza, tonsillitis and radiculitis in half the patients, with no other ailments in the other half. After the course of magnetotherapy, which involved 10-15 procedures daily for an unspecified number of days, most reported either the elimination of pain or significant improvements. After 7-9 months, the beneficial results of pain reduction and greater mobility remained for 50% of the patients.

[427-12131]

UDC 615.373:579.843.93].012.8

METHODS USED IN PREPARATION AND PURIFICATION OF CAPSULAR ANTIGEN  
AND ENDOTOXIN OF PLAGUE PATHOGEN

Moscow LABORATORNOYE DELO in Russian No 12, Dec 83  
(manuscript received 15 Jun 82) pp 37-39

VEYNBLAT, V. I., DAL'VADYANTS, S. M. and VERENKOV, M. S.,  
All-Union Scientific Anti plague Research Institute "Mikrob," Saratov

[Abstract] The proposed procedure for the production of capsular antigen and endotoxin gives a higher yield of purified and native preparations, makes it possible to use simplified apparatus, lowers the consumption of expensive reagents and avoids some steps which could lead to denaturation of antigens. A 15-18 fold increase of the yield of capsular antigen is claimed which is probably due to the culturing conditions used. Detailed step-by-step procedure for both the capsular antigen and for the plague endotoxin is reported. Reference 1 (Western).  
[484-7813]

UDC 579.843.1:615.919]-088.1

TITRATION OF CHOLERA TOXIN ON STAPHYLOCOCCUS AUREUS 209p UV-2 MUTANT

Moscow LABORATORNOYE DELO in Russian No 9, Sep 83  
(manuscript received 14 Sep 82) pp 52-53

PASTERNAK, N. A., VED'MINA, Ye. A., ANDRUSENKO, I. T., SHENDEROVICH, V. A.,  
ZHURAVLEVA, T. P. and SOBOLEV, V. R., Central Institute for the Advance  
Training of Physicians, Moscow

[Abstract] A rapid tube-dilution method is described for the titration of cholera toxin. Aliquots of the toxin are added to test tubes containing S. aureus 209p UV-2 mutant, incubated for 30 min at 37°C, followed by the addition of agarized methylene blue and sugar and further incubated for 2 h at 37°C. Qualitative information on toxin concentration is obtained from the degree of inhibition of dehydrogenase activity under

the anaerobic conditions. This method offers the advantages of speed of determination, simplicity, and eliminates the need for experimental animals. References 8: 3 Russian, 5 Western.  
[418-12172]

UDC 579.84:577.112'114'314.6

# LIPID A-PROTEIN COMPLEX FROM YERSINIA PSEUDOTUBERCULOSIS ENDOTOXIN

Moscow BIOORGANICHESKAYA KHIMIYA in Russian Vol 10, No 1, Jan 84  
(manuscript received 28 Mar 83; after revision 15 May 83) pp 93-99

FEDOROYEVA, L. I., SOLOV'YEVA, T. F. and OVODOV, Yu. S., Pacific Ocean Institute of Bioorganic Chemistry, Far East Science Center, USSR Academy of Sciences, Vladivostok

[Abstract] In order to study the structure of Yersinia pseudotuberculosis endotoxin, the lipid A-protein fragment was isolated from <sup>14</sup>C-labeled bacteria and purified on Sepharose 2B. The fragment was 30.1% protein and contained the components of lipid A, glucosamine, 3-hydroxytetradecanoic acid, dodecanoic acid and phosphorus, in pertinent amounts. It also contained 4.0% monosaccharide and 6.4% hexadecanoic acid. The fragment is negatively charged and moves as one complex in agarose electrophoresis. It forms one precipitation zone with endotoxin antiserum. The amino acid composition of the protein is characteristic of membrane proteins, with elevated acidic and hydrophobic amino acids and no cysteine. Polyacrylamide electrophoresis in the presence of sodium dodecylsulfate (SDS) indicates that the protein contains two chains, apparent molecular mass 12,000 and 8000 Da. The fragment inhibits passive hemolysis with lipid A antiserum. While it could not be broken with organic solvents or pronase, the lipid-protein bond could be dissociated with SDS and the components separated via sucrose density gradient ultracentrifugation in the presence of Triton X-100. The free protein and lipid from the dissociated complex retain serologic activity. The data indicate that the lipid A-protein bond, while stable, is not covalent. Figures 4; references 26: 4 Russian, 22 Western.  
[497-12126]

## SELECTIVITY AND SENSITIVITY TO HYDROGEN ION BLOCK OF BATRACHOTOXIN MODIFIED SODIUM CHANNELS IN NERVE FIBER MEMBRANE

Kiev NEIROFIZIOLOGIYA in Russian Vol 15, No 6, Nov-Dec 83  
(manuscript received 11 Jun 82) pp 571-579

MOZHAYEVA, G. N., NAUMOV, A. P. and KHODOROV, B. I., Institute of Cytology, USSR Academy of Sciences, Leningrad; Institute of Surgery imeni A. V. Vishnevskiy, USSR Academy of Medical Sciences, Moscow

[Abstract] Changes in the properties of the oxygen group and selectivity observed during modification of sodium channels by batrachotoxin (BTX) were studied under conditions of voltage clamp. It was shown that BTX altered the selectivity of sodium channels, their sensitivity toward  $H^+$  blocking and proton permeability analogously to aconitine. The permeability ratios determined by reversal potentials and by Goldman equation were:  $P_{Na}:P_{NH_4}:P_K = 1:0.47:0.19$ . In BTX modified sodium channels the relation of  $H_2:Na$  permeability was about 500, while for normal Na channels it was 200-300. Modified sodium channels were less sensitive to  $H_2$  block than the normal channels. Comparison of normal Na channels with those modified by BTX and aconitine could indicate that the lower the pK, the less selective was the channel toward  $Na^+$  and the more permeable it was toward larger cations such as  $K^+$  or  $NH_4^+$ . Figures 6; references 26: 7 Russian, 19 Western (7 by Russian authors). [438-7813]

PHYSIOLOGY

UDC 616.98:579.843.93]-07:616.155.33-008.13-092.9

COMPARATIVE FUNCTIONAL ASSESSMENT OF GUINEA PIG ALVEOLAR AND PERITONEAL  
MACROPHAGES: PHAGOCYTOSIS OF PLAGUE BACILLUS

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian  
No 12, Dec 83 (manuscript received 15 Feb 83) pp 85-86

VASIL'YEVA, G. I., DOROSHENKO, Ye. P., KISELEVA, A. K. and PUSTOVALOV, V. L.,  
Anti-Plague Scientific Research Institute, Rostov-on-Don

[Abstract] Comparative assessment was made of the efficiency of peritoneal and alveolar macrophages of the guinea pig in the phagocytosis and digestion of six vaccine strains of the plague bacillus (EV. TS, Otten 106/556, 487, 1, 17). In terms of all the criteria evaluated (phagocytic index, percentage of active phagocytes, digestive activity) the alveolar macrophages were inferior to the peritoneal macrophages in the destruction of the plague bacillus. In addition, the alveolar macrophages were also found to be much more susceptible to the cytopathic effects of the plague bacillus. These observations may account for the stormy course of pulmonary plague and the high mortality of such infections.  
[401-12172]

UDC 612.73:612.815:612.014:42

PROPERTIES OF SYNAPTIC CURRENTS DURING NONADRENERGIC INHIBITION OF SMOOTH  
MUSCLE CELLS OF GUINEA PIG COLON

Kiev NEIROFIZIOLOGIYA in Russian Vol 15, No 6, Nov-Dec 83  
(manuscript received 14 Oct 82) pp 624-631

GANITKEVICH, V. Ya., BAYDAN, L. V., TISHKIN, S. M. and SHUBA, M. F.,  
Institute of Physiology imeni A. A. Bagomolets, UkSSR Academy of Sciences,  
Kiev

[Abstract] Properties of synaptic currents during nonadrenergic inhibition of junctional transmission in colonic smooth muscle fibers are studied. An attempt is made to speculate about the processes occurring in these synapses. Using double sucrose gap method, inhibitory junction currents



(IJC) were recorded in guinea pigs in the presence of atropine and a voltage clamp condition as a response to intramural stimulation of the circular colon muscle. During fixation of the potential recorded in response to the stimulus, the IJC of the emerging direction reached exponential direction 100-150 ms after the peak. The amplitude of IJC was a linear function of the membrane potential. The reversal potential of IJC was in the range of potassium equilibrium potential. The IJC decay time constant depended on the membrane potential decreasing "e" fold during the hyperpolarization by 120 mV. A decrease or an increase of the quantal content of IJC led to corresponding change in the time constant. Apamine decreased the amplitude of IJC without affecting its kinetics, evidently due to partial occupation of postsynaptic ATP receptors. A conclusion is reached that under normal conditions the postsynaptic effect of the released mediator is close to its maximum level. Figures 6; references 18: 4 Russian, 14 Western.  
[438-7813]

UDC 615.471:612.821/.822.3-008:681.31

#### AUTOMATED SYSTEM FOR EVALUATION OF EVOKED SUBMICROVOLT SHORT LATENCY BRAIN POTENTIALS

Moscow MEDITSINSKAYA TEKHNIKA in Russian No 1, Jan-Feb 84  
(manuscript received 21 Apr 83) pp 12-15

KIREYEV, A. M., SHIROKOV, V. S., SHAKHNOVICH, A. R. and BELOUSOVA, O. B.,  
All-Union Scientific Research Institute of Medical Equipment Construction,  
Institute of Neurosurgery imeni N. N. Burdenko

[Abstract] The use of computers in clinical neurophysiology has opened new approaches to studies of the brain, various disorders and treatment monitoring. One of the more sensitive methods for this application is the acoustical and somatosensor stimulation of submicrovolt short latency brain potentials (SSBP). Repeated registry of these signals in a computer system (up to 3000 passages) makes it possible to recognize a signal whose amplitude could be below the noise level of an EEG and yet be recognizable. The methodology of this technique is described, presenting a flow chart for the application based on microcomputer technology. Figures 3; references 7: 5 Russian, 2 Western.  
[441-7813]

## RHYTHMIC ACTIVITY IN OPTICAL ANALYZER

Moscow USPEKHI FIZIOLOGICHESKIKH NAUK in Russian  
Vol 15 No 1, Jan-Feb 84 pp 3-27

IZNAKA, F. and GUSEL'NIKOV, V. I. (deceased), Moscow State University  
imeni M. V. Lomonosov, Department of Physiology of Higher Nervous Activity,  
Laboratory of Comparative Physiology and Evolution of Analyzers, Moscow

[Abstract] A review of domestic and foreign literature is presented covering the subject of rhythmic bioelectric processes in optical analysis of vertebrates. Special attention is given to new data which have not been covered by previous reviews. Rhythmic activity is covered in three subtopics: activity of the retina, rhythmic activity in external geniculum and activity of optical cortex. The final topic concerns the functional role of rhythms in optical systems. It is concluded that rhythmical processes in optical systems are dependent on some retarding mechanism which participates in organization of the receptive fields of optical neurons. Data of rhythmic EEG-phenomena relating to the origin of occipital human alpha-rhythm are reviewed. Interaction of various sections of the brain during generation of rhythmic activity is discussed along with its function in the treatment of optical information at various levels of the optical system. References 202: 63 Russian (4 by Western authors), 139 Western (1 by Russian authors).  
[442-7813]

UDC 612.821.6

## NEUROCHEMICAL SWITCHING OF CONDITIONED RESPONSE

Moscow USPEKHI FIZIOLOGICHESKIKH NAUK in Russian  
Vol 15, No 1, Jan-Feb 84 pp 115-125

ARKHIPOV, V. I., Institute of Biological Physics, USSR Academy of Sciences,  
Pushchino, Moscow Oblast

[Abstract] There exist physiological states of the brain in which various conditioned responses occur independently. Such dissociated states may be produced experimentally by a number of drugs. In the present paper a review of literature is reported on the phenomenon of drug discrimination. In principal, this discrimination is the result of two conditioned responses developed by animals: one is the result of a response to a drug action, one to its absence. The drug discrimination may be viewed as a conditioned reflex switch in which the pharmacological agent acts as the switching agent, so that this phenomenon can be viewed as a neuromechanism switching. Other topics included in this review cover

central and peripheral mechanisms of drug action, participation of mediator systems, utilization of neurochemical switching in pharmacological studies and in analyses of neurochemical mechanisms of the brain functions. The difference between neurochemical switching and the dissociated learning phenomenon are discussed. The mechanisms of conditioned reflex switching are characterized in very general terms. Many of the unanswered questions require further studies. References 51: 13 Russian, 38 Western.  
[442-7813]

UDC 547.964.4:591.481.1:57.083.3

RADIOIMMUNOLOGICAL STUDY OF DISTRIBUTION OF DSIP-LIKE MATERIAL IN VARIOUS ORGANS AND BRAIN SECTIONS OF RATS

Yerevan NEYROKHIMIYA in Russian Vol 2, No 4, Oct-Dec 83  
(manuscript received 30 Jul 82) pp 353-363

ROZHANETS, V. V., YUKHANANOV, R. Yu., CHIZHEVSKAYA, M. A. and NAVOLOTSKAYA, Ye. V., Institute of Pharmacology, USSR Academy of Medical Sciences, Moscow

[Abstract] The present article reports on radioimmunological analysis of delta-sleep inducing peptide [DSIP] in sections and subcellular fractions of rat brains and in other organs of rats. Subdivisions of the article cover findings on obtaining DSIP antibodies, iodizing tyrosyl analogs of DSIP and bonding them with serum, separating and extracting tissue, separating subcellular brain fractions and bonding marked peptides with membrane fractions. The sensitivity and specificity of radioimmunological analysis, and DSIP-like materials were identified by chromatography of organ extracts. Distribution was found to be regular throughout the tissues examined, with the lowest concentrations in the thalamus. DSIP-like materials were concentrated most highly in extrasynaptic mitochondria and myelin. Results indicated that delta-sleep inducing peptides were not to be found exclusively in brain tissues, but in other organs as well. Figures 4; references 12: 3 Russian, 9 Western.  
[437-12131]

## PUBLIC HEALTH

### CHILDREN'S DISEASES PERSIST DUE TO COMPLACENCY

[Editorial Report] Tbilisi KOMUNISTI in Georgian on 18 December 1983 page 4 carries a 400-word article by I. Muratidi, chief republic pediatrician-specialist in infectious diseases, deploring complacency on the part of parents and health care personnel toward childhood diseases such as diphtheria, small-pox, whooping cough, and so on, which have declined dramatically since vaccines were introduced. As a result of this complacency, as well as the fear of reaction to the vaccines, 60 percent of all children are exempted from shots, thus making "children's collectives" vulnerable to dangerous contagion.

### ADJARIAN HEALTH FACILITIES INADEQUATE

[Editorial Report] Tbilisi KOMUNISTI in Georgian on 10 December 1983 page 3 carries M. Gorgiladze's 1,200-word report of a raid conducted by him and several Adjarian republic and local health officials to determine pluses and minuses in the region's health facilities and services, particularly in the Khelvachauri Rayon. On the plus side, the village of Akhalsheni boasts a fine new 50-bed hospital, and there are some up-to-date polyclinics in the district

as well. But there are only 546 medical personnel (67 physicians) to serve the rayon's 79,000 inhabitants, and only 175 beds--less than half the norm. The central rayon hospital is old and dilapidated, and there are only two emergency teams. The only children's hospital in the ASSR is in Batumi, and it is always crowded. The rayon has no maternity hospital. The author also has a suggestion on the financing of health care facilities in Adjara: instead of the Health Ministry distributing funds to the rayispolkoms, from whence they tend to dwindle and end up hardly benefiting the facilities at all, he proposes strict centralization, in which major sums are parceled out by the ministry every 3 to 5 years to those facilities that need major repairs or construction, leaving the funding of current and minor repairs and maintenance to the "shefstvo" organizations. Finally, he notes that medical service transportation is quite inadequate and poorly run, with considerable discipline violations by irresponsible personnel up and down the line.

#### ROLE OF INTEGRITY, EQUIPMENT, RESEARCH IN HEALTH CARE

[Editorial Report] Tbilisi KOMUNISTI in Georgian on 24 December 1983 page 3 carries Professor and Distinguished Scientist A. Mindadze's 1,700-word article concerning the various crucial aspects of Georgian health care in light of the recent party-economic aktiv. The central element is the doctor himself, above and beyond any equipment and medicine. The choice of becoming a doctor thus includes aspects of integrity and ethics as well as training, and young people contemplating such a career must not do so merely for fashion or under family pressure. The author notes that, unfortunately, cases of outright wrongdoing as well as improper diagnosis, negligence, and irresponsibility are frequent. These arise both from greed and from poor training.

USSR Health Minister Burenkov and other all-union officials had high praise for Georgia's health care system, noting that morbidity and mortality were declining and lifespans increasing. Nevertheless, some of the medical research suffers from inadequate or scarce facilities and equipment (mention is made of tomographic and electromyographic instruments). On the other hand, costly equipment often stands unused. The author of the article lists a number of lines of ongoing research including brain studies and morphology, with special emphasis on ways to link theory with clinical practice. The final passages discuss the need to seek out, catalog, and make use of folk treatments and medicines.

#### CAUSES, TREATMENT OF RISING CANCER RATE IN WOMEN DISCUSSED

[Editorial Report] Tbilisi KOMUNISTI in Georgian on 17 December 1983 page 4 carries a 1,000-word article by Professor Dr of Med. Sci. L. Charkviani, head of the Women's Department in the Health Ministry's Oncological Center, concerning the rising rate of cancer in women--specifically, gynecological cancer (including breast cancer)--its causes, and a successful system that has been worked out to provide timely prophylactic measures to detect and treat the disease in the beginning stages. All these matters are dealt with in the context of the recent party-economic "health services" aktiv which, among other things, called for universal "dispensarization" of the Soviet population. Prophylactic cancer examinations were introduced in the USSR in the 1940s,

and the first such services for women in the Transcaucasus started in Adjara. In recent years, cancer examinations have been less effective, and overall rates are rising, while gynecological cancer leads among women; there are 25-30 percent fewer cases in Georgia, however.

At the aktiv, Shevardnadze called abortions "an antistate, antisocial phenomenon"--some 100,000 were recorded in Georgia in 1982 alone, twice the number in 1960--and Professor Charkviani states that this is "a leading cause" of gynecological cancer. Other factors include dietary deterioration, obesity, diabetes, metabolic disorders, and hypertension.

Cancer examinations have declined in effectiveness because most of them are performed under inadequate conditions "in the work place" by physicians who don't really care about long-term results. A new system is therefore called for. Experimental, epidemiological, and clinical research carried out by Professor Charkviani's department led to the decision to abolish "on-the-job" examinations in favor of "women's consultation office" examinations, to include case history investigations, cytological procedures, and so forth, with examinees classified in terms of the presence of "risk factors" (from a list of 18 worked out by the team). High risk women (those with four or more symptoms) are to receive yearly "in-depth" examinations and referred to treatment when so indicated. Experimental testing of the system in Tbilisi's Ordzhonikidze Rayon resulted in a 15-20 percent decline in high-risk cases and a 30-35 percent decline in the number of cases of gynecological cancer. Since the system is effective, economical, and requires no staff, financial material, or cadre reforms, Professor Charkviani urges that it be adopted everywhere within the context of universal dispenserization.

CSO: 1813/835

ORGANIZATION OF SCIENTIFIC STUDIES ON MALIGNANT NEOPLASMS IN RSFSR

Leningrad VOPROSY ONKOLOGII in Russian Vol 29, No 12, Dec 83 pp 3-6

CHISSOV, V. I., KAPATSINSKIY, Ye. V. and STARINSKIY, V. V.,  
Moscow Scientific Research Oncology Institute imeni P. A. Gertsen,  
RSFSR Ministry of Health

[Abstract] Measures taken by the Scientific Council of the RSFSR on the problem of improving diagnostics and treatment of malignant neoplasms include review of research plans and reports, oversight and planning. The Moscow Scientific Research Oncology Institute imeni P. A. Gertsen is conducting research on the use of computers in x-ray interpretation and study-data management, as well as on the improvement of standardized criteria for the diagnosis of breast and other cancers. The use of lasers in oncology, hyperbaric oxygenation, intralymphatic chemotherapy and magnetotherapy, high energy gamma therapy and new surgical procedures are also under study. Investigations are proceeding in cooperation with 54 oncological dispensaries. Determination of the geographical distribution of cancers, application of research results to preventive medicine and involvement of Siberia and the Far East are areas where more work is needed. More effective cooperation with the oncological professionals of the krays, oblasts and autonomous republics is planned.  
[477-12126]

WORKERS' HEALTH AND SOCIOECONOMIC PROGRESS

Moscow POLITICHESKOYE SAMOOBRAZOVANIYE in Russian No 2, Feb 84 pp 36-43

CHAZOV, Ye., academician, and TSAREGORODTSEV, G., professor

[Abstract] Public health and socioeconomic progress are intimately related, and the preservation and improvement of workers' health represents the physicians direct contribution to the national economy. One of the most serious problems in the USSR in the field of health is posed by the rising incidence of cardiovascular diseases and the disability they cause. While in 1939 cardiovascular diseases accounted for 11% of the total mortality in the USSR, by 1972 this figure had risen to 48.3% and is one of the key factors responsible for holding down further increase in longevity in the Soviet Union. Despite significant and remarkable progress made by Soviet science and medicine in the treatment of cardiovascular problems, much remains to be accomplished in improving public awareness of this problem and in instituting appropriate preventive measures. Recent statistical surveys have shown that, by age 16, almost 40% of the adolescents smoke, while 8-12% of the senior class students have hypertension. These facts alone show the need for establishing programs of health education that encompass the younger segments of our population.  
[492-12172]

ROLE OF INTER-OBLAST AND INTER-RAYON NEUROSURGICAL CENTERS IN PROVIDING  
SPECIALIZED HEALTH CARE TO THE RURAL POPULATION

Moscow VOPROSY NEYROKHIRURGII in Russian No 6, Nov-Dec 83 pp 3-6

BABICHENKO, Ye. I. and YARTSEV, V. V., Saratov Medical Institute;  
Institute of Neurosurgery imeni N. N. Burdenko, USSR Academy of Medical  
Sciences, Moscow

[Abstract] At the present time very few central rayon hospitals have neurosurgical services, and this fact alone is responsible for the situation that 85% of patient load in such services is accounted for by urban dwellers. In order to expand neurosurgical health care to the rural population, every effort must be made to establish and staff such services in the inter-oblast and inter-rayon hospitals, and to establish neurosurgical centers. The RSFSR and the Ukraine have taken the lead in establishing such centers and have instituted ancillary programs to render them effective and efficient. The expansion of a network of such specialized centers will greatly contribute to further improvement in the health status of the Soviet people.  
[412-12172]

ORGANIZATION OF RADIOLOGICAL ASSISTANCE FOR RURAL COMMUNITY

Moscow VESTNIK RENTGENOLOGII I RADIOLOGII No 6, Nov-Dec 83 pp 73-74

GORELOVA, L. N., candidate of medical sciences

[Abstract] Improvement of radiological aid for rural areas occupies an important place in the overall program for improving rural health care. Improvement of radiological aid at central rayon hospitals is now underway and provision of modern equipment to these institutions is improving medical care especially with regard to treatment of tuberculosis and lung tumors and treatment of mammary gland diseases in women over the age of 35 years. Other measures underway include: development of adequate radiological service in rural uchastok hospitals, tours of duty of radiological specialists in rural areas to serve as consultants in radiological matters and advanced training for medical radiologists working in rayon hospitals. Other measures which should be introduced include joint work of practical public health agencies personnel and radiological specialists, more extensive consultation of radiological specialists with personnel working in radiology at rayon hospitals and the availability of highly qualified specialists for consultation and better x-ray diagnosis procedures in the village.  
[451-2791]



## DISPENSARIZATION (MASS SCREENING): FUNDAMENTAL APPROACH IN PREVENTIVE SOVIET MEDICINE

Moscow TERAPEVTICHESKIY ARKHIV in Russian No 1, Jan 84  
(manuscript received 10 Nov 83) pp 3-8

SHCHEPIN, O. P., First Deputy Minister of Health, USSR

[Abstract] A review is presented of recent Soviet policies in the field of public health, which represent the care and concern of the Communist Party and of the Soviet Government for the welfare and health of the Soviet People. A key feature of the recent trends, as embodied in the recommendations of the June 1983 Plenum of the CC CPSU, is the establishment of a nationwide screening program [dispensarization] for the early detection of various disorders, particularly oncologic, nervous and cardiovascular, and identification of individuals at risk. It is anticipated that such a program will reduce by 6-20% the types of morbidity leading to loss of work days. In addition to new and improved methods of public information, raising health consciousness, and combating the tendencies to self-diagnosis and self-treatment still too prevalent in Soviet society, a special Interdepartmental Council has been created to coordinate the various efforts of this program. The major responsibility for the success of this program will fall on the various polyclinics and ambulatory health facilities, and the local authorities bear the responsibility for making it possible for such institutions to carry out the program successfully.

[357-12172]

UDC 616.127-005.8-036.2(571.14-25)

## EPIDEMIOLOGY OF MYOCARDIAL INFARCTION IN NOVOSIBIRSK

Moscow TERAPEVTICHESKIY ZHURNAL in Russian No 1, Jan 84  
(manuscript received 6 May 83) pp 65-70

GAFAROV, V. V., SOSHIN, K. V., GATKIN, Ya. Sh., KOZEL, N. G. and SVETLOV, V. I., Chair of Therapy and Cardiology, Central Scientific Research Laboratory, Novosibirsk Medical Institute

[Abstract] An analysis was conducted on the epidemiology of myocardial infarction in three rayons (Leninskiy, Kirovskiy, Oktyabr'skiy) of Novosibirsk in accordance with the 1969 WHO Ischaemic Heart Disease Registers program. In 1981 there were 1005 cases of myocardial infarction in the 20-64 year age group, with the incidence in males almost three times greater than for females ( $P < 0.001$ ). The highest incidence was noted in the Kirovskiy rayon (4.74/1000 for males, 1.69/1000 for females,

and the lowest in the Leninskiy rayon (3.64/1000 for males and 1.18/1000 for females); the differences between these two rayons were statistically significant. There were no significant differences among the rayons in the 60-64 age group. In general, the time from the first attack of pain until medical attention was sought lasted from 20.6 h (emergency services to 65.6 h (polyclinics) because of lack of appreciation of the seriousness of the situation. A further analysis revealed that in 39.9% of the cases a diagnosis of myocardial infarction was not made at the time of the first examination. These observations underline the need for greater emphasis on health education of the population in the city, as well as the need for greater physician alertness to the possibility of a myocardial infarction and a higher index of suspicion. References 18: 12 Russian, 6 Western.  
[357-12172]

UDC 616.12-005.4+616.12-008.331.1]-07:612.118.221.2

#### ABO BLOOD GROUPS AS RISK FACTORS IN ISCHEMIC HEART DISEASE AND HYPERTENSION IN VARIOUS ETHNIC GROUPS

Moscow TERAPEVTICHESKIY ZHURNAL in Russian No 1, Jan 84  
(manuscript received 23 Mar 82) pp 72-76

RAFALOVICH, M. G., MAZUROVA, A. M., MINAYEVA, M. G., BESSONOVA, G. A., ZIL'BERT, N. I., TARALA, G. T. and LEDUKHOVSKAYA, L. G., Chair of Elective Therapy, Stavropol Medical Institute

[Abstract] A study was conducted in the Karachayevo-Cherkess Autonomous Oblast on the significance of the ABO blood groups as a risk factor for ischemic heart disease (IHD) and hypertension (HT) among the various ethnic groups in the area on the basis of the coefficient of relative morbidity. Evaluation of 3450 males with IHD and 2209 with HT showed that ethnic group A Russians that had resided in the oblast for at least 20 years had a 21% higher incidence of IHD than individuals with groups O, B or AB. Among the native populations, individuals with the AB group had the highest incidence of IHD: by 67% among the Karachayevs, by 59% among the Nogais, by 49% among the Abazins and by 23% among the Cherkess in comparison with individuals with the A, O or B groups for the respective nationality. In terms of HT, Russians with group O had a higher incidence by 34% than individuals with the other three groups, while Cherkess with group B had an incidence 53% higher than their other co-nationals. It appears, on the basis of the present data, that within the national groups considered, the ABO blood groups can be regarded as indicative of predisposition to IHD and HT. References 32: 26 Russian, 6 Western.  
[357-12172]

## MASSIVE PROGNOSTIC STUDIES AS A FORM OF MASS SCREENING OF POPULATION

Moscow SOVETSKAYA MEDITSINA in Russian No 10, Oct 83  
(manuscript received 28 Dec 82) pp 70-72

SAZONOV, A. M., BAYEVSKIY, R. M., BERSENEVA, A. P. and PALEYEV, N. R., Moscow

[Abstract] In recent years, a new approach has been developed for evaluation of the health status of individuals. In it the transition from health to sickness is analyzed as an adaptation process to the environment. The quality of health may be viewed as an ability to compensate for various "deviations" of an organism. Evaluation of "quality of health" classifies people into 4 groups: 1- those with highly functioning organism requiring no health improvement measures; 2- those with increased activation of adaptation mechanism, who need something to lower their stress; 3- individuals with inadequate adaptation to the environment who require healing and preventive measures; and 4- those with a loss of adaptive powers who need prophylactic and therapeutic measures. To recognize these stages, a method was developed on the basis of cardiovascular indices, EKG, analysis of heart rhythm, a questionnaire, etc. A study population was examined with this method showing surprisingly low levels of "health quality" among the labor force, especially those over 40 years of age. Massive examinations of the population [dispensarization] make it possible to isolate various groups according to their "health quality" and the risk of developing certain diseases. These individuals "at risk" should be exposed to prophylactic measures. Reference 1 (Russian). [355-7813]

UDC: 619 :616-073.537:616.981.452:636.4

DETECTION OF CLASSICAL SWINE PLAGUE VIRUS BY FLUORESCENT ANTIBODY METHOD  
(Review)

Moscow VETERINARIYA in Russian No 1, Jan 84 pp 27-29

POPOV, V. I., All-Union Scientific Research Institute of Veterinary Virology  
and Microbiology

[Abstract] The complement fixation reaction, precipitation, hemagglutination, swine plague virus interference with Newcastle disease virus and other viruses have been suggested for detection of the classical swine plague pathogen. However, these methods are not sufficiently specific. Various authors have reported better results by the method of fluorescent antibodies, which has been found to be highly sensitive, specific, rapid and easy to perform, and highly reliable in comparison to other methods. This article discusses various results which have been reported in the Soviet and western literature concerning the method, indicating that it can be broadly used for the study of various problems of diagnosis, pathogenesis and immunogenesis of the disease. However, the nature of the fluorescing antibodies has not been finally established, there are no standard methods for production of serum and preparation of fluorescent conjugate, and the optimal times for production and processing of the materials have not been established.

[280-6508]

UDC: 619:612.017.1:616.982.2:616.981.42:636.22/28

IMMUNOLOGIC MEMORY AND TOLERANCE IN CALVES WITH TUBERCULOSIS AND BRUCELLOSIS

Moscow VETERINARIYA in Russian No 1, Jan 84, pp 29-30

BAZHIN, M. A., Siberian Veterinary Scientific Research Institute

[Abstract] Results are presented from studies of the manifestations of immunologic memory and tolerance in calves with tuberculosis and brucellosis present in the herd. In an area unfavorable with respect to tuberculosis,

calves 1 to 4 months of age not reacting to the tuberculin were immunized with vaccine, then tuberculin-tested a month later. The results of the test were used to select 10 animals with clear reaction, 10 which did not react or reacted little and 5 which were not immunized but had positive tuberculin reaction. The animals were sacrificed 5 months after vaccination and tuberculosis detected in 6 of the animals in the first group and 4 from the third (nonvaccinated) group, but none from the second group. The results indicate that 8 of the calves in group one had tuberculosis before vaccination but did not react in the tuberculin test. Determination of the status of the immunologic memory and tolerance in chronic infectious locations may facilitate an effective diagnosis.  
[280-6508]

UDC: 619:616.578.88/89

#### VETERINARY PARASITOCENOLOGY

Moscow VETERINARIYA in Russian No 1, Jan 84 pp 45-47

PANASYUK, D. I., All-Union Institute of Helminthology imeni K. I. Skryabin

[Abstract] The difference is explained between the concepts of association and symbiosis. The concept of the parasitocenosis, referring to the entire population of parasites in a given organism in all its various organs and parts of the body, includes spirochaetes, bacteria, fungi, protozoa, helminths and other arthropods. Based on an analysis of the literature and his own investigations, the author concludes that the parasitocenosis includes the individuals or micropopulations of species, considering the complex two-way system of interactions between members and hosts, and refers to a temporary, constantly changing and unstable system of living organisms. Parasitocenology is therefore a complex veterinary science, comprehensively studying the interrelations and interconnections of members of the parasitocenosis with the host and each other as well as the environment, and also resulting diseases of the hosts.  
[280-6508]

UDC: 619:576.807.9:616.983.43

#### INCREASING SENSITIVITY OF RADIAL IMMUNODIFFUSION REACTION IN DETECTION OF FOOT-AND-MOUTH DISEASE ANTIBODIES

Moscow VETERINARIYA in Russian No 1, Jan 84 pp 70-71

SHAZHKO, Zh. A. and MISHCHENKO, V. A., All-Union Scientific Research Institute of Foot-and-Mouth Disease

[Abstract] The purpose of this study was to determine some specifics of performance of the reaction of radial immunodiffusion in foot-and-mouth

disease and to determine the possibility of its use to study antfoot-and-mouth disease immunity and for retrospective diagnosis of this disease in agricultural animals. It is found that the reaction can detect antibodies in 88.4% of cases as opposed to 73-100% in other methods of diagnosis.  
[280-6508]

#### TICK-BORNE DISEASES IN ANIMALS

Ashkhabad SEL'SKOYE KHOZYAYSTVO TURKMENISTANA in Russian No 10, Oct 83 p 29

REVENKO, A. S., MAKSIMOVA, A. A., Ashkhabad Oblast Veterinary Laboratory

[Abstract] A discussion is presented of francyolosis, tailorosis and other cattle blood parasite diseases. Control of francyolosis is particularly difficult because pure outbreaks of this disease alone, without intermixed tailorosis and other tick-borne diseases, are rare. It is quite necessary that barns, barnyards and other areas where animals are kept be carefully cleaned mechanically at least 3 times during the tick season. Cattle should also be prevented from wading deeply into ponds or streams, to washing off tick control substances applied to the cattle. Veterinary specialists should perform tick control treatment of all cattle in invested regions.

[307-6508]

## CONFERENCES

UDC 615.47.012:519.24]:061.3[47+57]+44 "1983"

SOVIET-FRENCH SYMPOSIUM ON "APPLICATION OF PHYSICAL AND MATHEMATICAL METHODS AND MEANS OF COMPUTER TECHNOLOGY IN DESIGNING MEDICAL EQUIPMENT AND SYSTEMS"

Moscow MEDITSINSKAYA TEKHNIKA in Russian No 1, Jan-Feb 84 pp 61-62

GUL'DIN, V. I., Moscow

[Abstract] The third Soviet-French symposium on the title theme was held in Tashkent during 26-28 October 1983 and was attended by 60 scientists from both countries. There were 28 papers and 10 posters presented on design and automation of equipment, radioisotope imaging units, micro-processing techniques, laboratory applications and electronic equipment for diagnosis (mass screening) and therapy. The next symposium is scheduled for 1985, to be held in France. No individual papers are abstracted.  
[441-7813]

## MISCELLANEOUS

### PARAPSYCHOLOGY AND MENTAL HEALTH

Kishinev ZDRAVOOKHRANENIYE in Russian No 1, Jan-Feb 84

[Review by V. Berlinskiy and E.P. Popushoy of book "Parapsychology and Psychic Health" by V.A. Kir'yak, V.M. Mikhlin, "Kartya Moldovenyaske", Kishinev, 1983]

[Text] Maybe the most wonderful feeling which man can experience is approaching the unknown, the mysterious. Yet, how offended one becomes when, instead of interest in genuine miracles of science and culture, there arises a yearning for false, illusory mysteries? The book being reviewed deals with the activity of admirers of telepathy, telekinesis, clairvoyance and magical diagnosis of diseases. In other words, it is about varieties of so-called "secret knowledge," or occultism.

It is no secret that information about imaginary miracles are still widely encountered in the press and even in popular scientific publications. However, at the last annual general conference of the USSR Academy of Sciences, the absurd claims of parapsychologists were given their deserved rebuke. In the presentations of great scientists, the following paradox was emphasized: parascientific recommendations have been published in massive printings, while the necessary evaluation of the pseudoscientific pretensions are in special sources which get little distribution. Hence, a broad critique of the periscientific superstitions and distribution of genuine, naturally-scientific knowledge, especially in biology, biophysics and peripheral fields of medicine and agriculture, are so essential today.

Contemporary priests of "secret knowledge" lay claim to the affirmation of such insipid conceptions as bioplasm, field transmutation, psychic phenomena and others. Efforts to expose imaginary mysteries are difficult enough, because people do not wish to part with the experience of a miracle. But this great amount of effort is very necessary, for the reason that it throws a damper on the formation of mystical directions in the comprehension of the world and of oneself. And clearing of weeds from scientific knowledge only emphasizes the genuine achievements of science. For example, removing the conception of bioplasm from scientific use encourages a fruitful search for principles of the system of the function of the brain, the development of microelectrode procedures and psychophysiology as a whole.



From the positions of Marxist-Leninist philosophy, the authors expose the mechanism of complex psychic phenomena (dominating idea, hypnosis, etc.). They point out that methodological errors in the theory of perception in certain conditions promote the spread of magic, witchcraft, mysticism, etc. Therefore, Marxist-Leninist gnosiology is the theoretical and methodological basis for criticizing occultism.

The authors successively examine the historical, cognitive and psychological roots of modern superstitions. Ideas which are based on an infantile thirst for miracles of distributing thoughts over great distances, magical forecasting, moving objects with the power of one's spirit and healing by simple laying on of hands have changed little in a thousand years. The authors present reasons for this remarkable stability. The authors' attempt to go beyond the boundaries of essentially psychophysiological problems, by contrasting general philosophical views of the essence of man and his place in the world with the characteristics of magical delusions of one or another epoch, need only be welcomed.

Showing that mystical, religious and magical ideas have social, gnosiological and psychological roots, the authors of this book stress the paramount importance of social factors. The position of scientists in the capitalistic world is also significant, as well as the indifference of scientists of the West toward the epidemic of occultism and parapsychology. The global and difficultly resolved crises of capitalistic countries incite the masses to take up an unscientific position. As for reasons that our people take up with magical interests, they lie either in the singularity of the microsocial environment or in peculiarities of the private-individual structure. In this connection, a complex approach to the study of these phenomena on the basis of Marxist-Leninist methodology is valid. Therefore, the authors are correct when they assert that it is useless to seek roots of spiritualism, telepathy and psychokinesis only in psychological or gnosiological spheres. It is interesting to get acquainted with the authors' own materials which deal with the influences of occult practices on the formation of personalities or the roles of pathological personalities in the continuance and spread of mystical and religious ideas.

In the final chapter, they successfully tie in problems of moral and atheistic education which arise in connection with overcoming pseudoscientific superstitions. Interest in parapsychology does not give anything to a personality except an exhausting self-interest, individualistic orientation and a mystical frame of mind. It is not by chance that bourgeois culture has always attempted, along with primitivization of social and aesthetic needs, to instill belief in occult miracles. This is especially important in modern conditions of intensification of the ideological struggle.

This book serves to ensure that the bond between man and the world is expressed in a scientific and not in a mystified form. And this has been written absorbingly, passionately and in earnest. The book includes a series of interesting, tastefully selected illustrative materials. It has a sufficiently extensive bibliography.

It remains only to hope that this very thoughtful and entertaining work will be translated into the Russian language and will thereby become available to the broad reading audience of this country.

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12473

CSO: 1840/519

## FOREIGN MEDICAL EQUIPMENT EXHIBIT

Moscow IZVESTIYA in Russian 25 Feb 84 p 4

[Article by V. Shmyganovskiy: "The Physician's Entire Arsenal. Notes from an International Exhibit"]

[Text] For the majority of the equipment presented at this exhibit in the Sokol'niki Pavilion No 5, the time, as they say, is not yet ripe, despite its glittering magnificence and saturation with "memory units" and other electronic marvels.

But turning to this technology, alas, is inevitable. Sooner or later, everyone will have to. Because there is nothing else like the modern arsenal for medical establishments which is presented here. The exhibit itself is called "Bol'nitsa-84. About 200 firms from Austria, Great Britain, the USA, Japan, and other countries are taking part in it.

Scarcely a year has passed since such a display was put on, organized by the Swiss Sovexpo Company in cooperation with the USSR Chamber of Commerce and Industry--and now the topic is being continued. But in contrast to the first exposition, which attempted to take in almost all aspects of medical technology, the present one has been designed in a more purposeful fashion. Its sections include pediatrics (especially for newborns), traumatology, first aid equipment, and the fitting-out of young medical personnel.

Many companies already have firm ties with our foreign trade organizations. The Swedish firm Gambro is one example. I had the change to converse with its young president, Anders Altin, several months ago, when Gambro set up equipment to produce 200,000 filters a year, which can be used in both Soviet and imported "artificial kidney" apparatus. This production began at the Belgorod-Dnestrovskiy Plant of Polymer Medical Products (Odessa Oblast).

The dialysis machine is a small container with membranes and microscopic pores in which the patient's blood is cleaned of impurities and put back

into the body. The deciding conditions for concluding the contract with the Prommash-import All-Union Association were the company's high reputation and the humane nature of this transaction.

Interestingly enough, Gambro does not have a permanent office in Moscow. The Soviet firm Inpred, under the Sovintsentr All-Union Association, represents it in our country and acts as a consultant.

"We are convinced of the effectiveness of this form of cooperation for small and medium-sized companies," said A. Altin. "Gambro has increased its volume of trade with the USSR tenfold in the last eight years thanks to Inpred's substantial service. We were one of the first western firms to employ its services."

The Belgian company Generales Equipments Medicales (GEM) supplies us with x-ray facilities with reduced radiation dosage and and remote control, as well as other complex apparatus, particularly for mammary gland examination. A model of the same equipment has been made using a Soviet generator.

This time GEM arrived with an informative display. Soon it will be organizing an independent exposition in Moscow.

There are many electronic instruments at this display. Miniature devices to determine temperature in a few seconds, convient scales for weighing nursing babies, chair scales, cot scales,....

Part of the apparatus reminds one of equipment of a good gym with a "race-track" on which one can run a marathon...without leaving the building. These devices, intended for rehabilitation of patients after injuries, are being displayed by the Dutch company Almark.

Current medical technology is becoming increasingly complex, drawing on the recent advances of science. And medical treatment in a number of countries, alas, is a costly thing. Recall that a single day's occupancy in the average U.S. hospital costs around 200 dollars, and when all the magnificent, marvelous superelectronic equipment for analysis, diagnosis, and treatment comes into it, the cost begins to grow catastrophically. Anesthesia--600 dollars, x-rays--720 dollars, and so on, and so forth.

It only remains to say that all these innovations, which we will see in our hospitals and polyclinics following the exhibit, which finishes its work on 25 February, will serve our people without charge regardless of how expensive they are.

12255

CSO: 1840/488

#### WORKING CAPACITY AND FATIGUE IN COLORED SURROUNDINGS

Moscow GIGIYENA TRUDA I PROFESSIONAL'NYYE ZABOLEVANIYA in Russian No 1, Jan 84 (manuscript received 23 Aug 82) pp 18-21

BELYAYEVA, N. M. and RYABOV, Yu. S., Institute of Construction Physics, Moscow

[Abstract] A study was made of the influence of color in the environment on the working capacity and fatigue of workers performing class III operations on achromatic objects. Class III operations include common types of work in factories and public buildings. The color tone, intensity and angular dimensions of colored objects were varied in the study. It was found that even when workers deal with achromatic objects, color is an esthetic and even physiological environmental factor. The particular color used had no influence on working capacity and fatigue given equal saturation. Figure 1; references 9 (Russian).  
[277-6508]

#### HEALTH COMPLEX IN INDUSTRIAL SETTING

Tallinn SOVETSKAYA ESTONIYA in Russian 10 Mar 84 p 2

KALPIN, M.

[Abstract] A health complex has been created at the Tartu Instrument Manufacturing Plant to improve the outlook attitude and health of workers at the plant. This complex provides for rest, relaxation and autogenic training and, what is a novelty in industrial settings, phytotherapy on an experimental basis. Phytotherapy was introduced in collaboration with the Department of Phytotherapy and Medicinal Drugs of the Central Republic Botanical Garden of the Ukrainian SSR Academy of Sciences, where the scientists had established the general toning and other beneficial effects of exposure to phytoncides. After ten minutes of such a relaxing session, which provides for alleviation of psychophysiological stress and fatigue, the workers are said to return to their assignments refreshed and invigorated. Illustrations 1.  
[490-12172]

SYSTEMATICS OF ENDEMIC LAKE BAIKAL SPECIES OF GENUS MEGALVALVATA AND  
TAXONOMIC PROBLEMS OF FAMILY VALVATIDAE (GASTROPODA, PECTINIBRANCHIA)

Moscow ZOOLOGICHESKIY ZHURNAL in Russian No 1, Jan 83  
(manuscript received 8 May 81) pp 32-43

SITNIKOVA, T. Ya., Soil Biology Faculty, Leningrad State University

[Abstract] On the basis of the structural features of the generative apparatus and shell characteristics, the genera and subgenera of the family Valvatidae were revised. On the basis of the new scheme, the family is divided into two subfamilies and six genera as follows: Borystheniinae Star., subf. n.--genus Borysthenia Lyndh., 1913; Valvatinae Gray, 1840--general Valvata Muell., 1774 (with subgenera Valvata s. str. and Microcincinna Star. subg. n.), Cincinna Huebn., 1810 (with subgn. Cincinna s. str. = Atropidina Lindh., 1906; Sibirovalvata Star. et Str., 1967; Pseudomegalovalvata Kozh., 1936; Pamirocincinna Sitn. et Star. subgen. n.; Costovalvata Pol., 1929); Tropidina H. et Ad., 1854; Ohridotropidina Hadz., 1859; and Megalovalvata Lindh. 1909 (with subgen. Megalovalvata s. st. and Biwakoalvata Star. subgen. n.) The six Baikal species of the genus Megalovalvata are reviewed, including the new species M. kozhovi Sitn., sp. n. The Lecto-types have been established for all the species determination in the families Valvatidae in Lake Baikal and its vicinity. Figures 2; references 8: 6 Russian, 2 Western.  
[1015-12172]

UDC 594.1:591.151

SHELL VARIABILITY IN WHITE SEA PORTLANDIA ARCTICA (MOLLUSCA, BIVALVIA)

Moscow ZOOLOGICHESKIY ZHURNAL in Russian No 1, Jan 83  
(manuscript received 2 Jul 81) pp 45-50

NAUMOV, A. D., NINBURG, Ye. A. and ROSTOVA, N. S., Institute of Zoology,  
USSR Academy of Sciences, Leningrad

[Abstract] Studies were conducted on the shell variability of Portlandia artica specimens collected from the Kandalaksha Bay in the White Sea in order to determine whether two forms of Portlandia exist in that ecologic niche. Examination of 990 specimens showed a lack of any definitive criteria for dividing this genus into two groups. Of the three criteria utilized, two--elongation (ratio of height to length) and sagittal curvature (ratio of thickness to length)--were found to be dependent on size or, in other words, age. For taxonomic purposes the most promising indicator appears to be frontal curvature (ratio of thickness to height) which seems to reflect specific shell growth patterns. Figures 2; references 11: 7 Russian, 4 Western.  
[1015-12172]

ADAPTATION TO SALINITY AND OSMOREGULATORY FLEXIBILITY OF CASPIAN AND ARAL  
SEA OSTRACODA

Moscow ZOOLOGICHESKIY ZHURNAL in Russian No 1 Jan-Feb 83  
(manuscript received 18 Jan 82) pp 51-57

ALADIN, N. V., Institute of Zoology, USSR Academy of Sciences, Leningrad

[Abstract] Microcryoscopic and biochemical studies on ostracoda obtained from the Caspian Sea and the Sea of Aral showed them to have the physiological facility for hyperosmotic and amphiosmotic (hyper- and hypo-osmotic) osmoregulation. The amphiosmotic type of regulation, however, was shown by only two (*Cyprideis torosa* and *Eucypris inflata*) of the 14 species studied. The ostracods also possess an isolating reflex which allows them to seal themselves off from an unfavorable environment by closing their valves tightly. It is anticipated that if further increases in salinity of these two water bodies take place, the ostracoda that are unable to regulate their osmotic status by the amphiosmotic mechanism will die out. This appears to be within the realm of reality in the Sea of Aral, where water salinity has increased by 6-8% during the past decade. Figures 1; references 26: 11 Russian, 15 Western.  
[1015-12172]

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