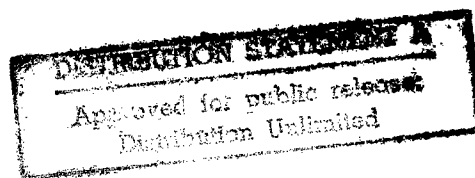


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USSR REPORT
LIFE SCIENCES
BIOMEDICAL AND BEHAVIORAL SCIENCES

CONTENTS

AGROTECHNOLOGY

- Synthesis and Growth-Regulating Activity of Derivatives
of Tetrachloropyridine With Oxygen-Containing
Functional Substituents
(V. P. Kukhar', et al.; FIZIOLOGICHESKI
AKTIVNYYE VESHCHESTVA, No 14, 1982)..... 1

BIOCHEMISTRY

- Chitin: Biological Functions and Practical Applications
(Ye. P. Feofilova; PRILADNAYA BIOKHIMIYA I
MIKROBIOLOGIYA, No 2, Mar-Apr 84)..... 2
- Location and Identification of Nucleoside Phosphate
Bonded With Shell Protein of T4 Bacteriophage
(I. I. Serysheva, et al.; DOKLADY AKADEMII
NAUK SSSR, No 5, Apr 84)..... 3
- Effects of Biologically Active Compounds on $(Ca^{++}-Mg^{++})$ -
Dependent ATPase of Sarcoplasmic Reticulum Reconstructed
With Synthetic Phospholipids
(L. V. Tat'yanenko, et al.; MOLEKULYARNAYA
BIOLOGIYA, No 2, Mar-Apr 84)..... 3
- Relay Model for Lipid Peroxidation in Biological Membranes
(I. I. Ivanov; MOLEKILYARNAYA BIOLOGIYA, No 2,
Mar-Apr 84)..... 4
- Peptide Synthesis in Aqueous Media
(N. A. Samoylova, et al.; BIOORGANICHESKAYA
KHIMIYA, No 6, Jun 84)..... 4

Production of Insoluble Conjugates of Phospholipase A ₂ and Staphylococcus Toxin (Kh. K. Sultanov, et al.; UZBEKSKIY BIOLOGICHESKIY ZHURNAL, No 3, May-Jun 84).....	5
Cultural-Morphological Characteristics of Pesticide Resistant and Auxotrophic Strains of Verticillium Dahliae Kleb (R. A. Atakuziyeva, Zh. Safiyazov; UZBEKSKIY BIOLOGICHESKIY ZHURNAL, No 3, May-Jun 84).....	6
Light and Transmission Microscopy of Poison Glands of Green Toad (I. K. Kadyrov, L. F. Leonov; UZBEKSKIY BIOLOGICHESKIY ZHURNAL, No 3, May-Jun 84).....	6
Sixteenth Conference of Federation of European Biochemical Societies (Ye. Mancharova, M. Khromchenko; IZVESTIYA, 27 Jun 84).....	7
Affinity Chromatography of Nucleases (G. Ye. Bannikova, et al.; BIOORGANICHESKAYA KHIMIYA, No 3, Mar 84).....	7
Biosynthetic ¹⁹ F and ¹⁴ C- Derivatives of Bacteriorhodopsin (A. B. Kuryatov, et al.; BIOORGANICHESKAYA KHIMIYA, No 3, Mar 84).....	8
Chemical Modification of Sulfhydryl Groups in Rhodopsin. Localization of Disulfide Bonds (A. B. Kudelin, et al.; BIOORGANICHESKAYA KHIMIYA, No 3, Mar 84).....	8
Kinetics of ATP-Pyrophosphate Isotope Exchange Catalyzed by Phage T4 RNA Ligase (S. N. Zagrebel'nyy, et al.; MOLEKULYARNAYA BIOLOGIYA, No 1, Jan-Feb 84).....	9
Restriction Endonuclease EcoRV: Physical and Catalytic Properties of Homogenous Enzyme (N. P. Kuz'min, et al.; MOLEKULYARNAYA BIOLOGIYA, No 1, Jan-Feb 84).....	10
Specificity of Noval Restrictases and Methylases: Unusual Modification of Cytosine at C ₄ (A. A. Yanulaytis, et al.; MOLEKULYARNAYA BIOLOGIYA, No 1, Jan-Feb 84).....	10

BIONICS

Proportions of Human Arm (Applying Concepts of Robotics in Biomechanis) (A. A. Kobrinskiy, A. Ye. Kobrinskiy; DOKLADY AKADEMII NAUK SSSR, No 6, Jun 84).....	12
---	----

BIOPHYSICS

- Nature of Dependence of Blocking Ion Channels on Membrane Potential
(Kh. A. Gadzhi-Zade, A. Ya. Zil'bershteyn;
DOKLADY AKADEMII NAUK SSSR, No 5, Apr 84)..... 13
- Adenylate and GDP Kinases of Frog Retina Outer Rod Segments:
Putative Functional Role of Transducin T β Subunit
(V. G. Tishchenkov, N. Ya. Orlov; MOLEKULYARNAYA
BIOLOGIYA, No 3, May-Jun 84)..... 13

BIOTECHNOLOGY

- Medical Aspects of Problems of Physico-Chemical Biology
and Biotechnology
(R. F. Dzyublik, et al.; VRACHEBNOYE DELO,
No 6, Jun 84)..... 15
- Immobilization of Actinomyces Olivocinereus 154 Glucose
Isomerase on Macroporous Silica Carriers
(O. I. Voroshilova, et al.; PRIKLADNAYA BIOKHIMIYA
I MIKROBIOLOGIYA, No 2, Mar-Apr 84)..... 17
- Mathematical Modeling of Immobilized-Enzyme Extracorporeal
Shunts
(A. N. Bulygin, et al.; PRIKLADNAYA BIOKHIMIYA
I MIKROBIOLOGIYA, No 2, Mar-Apr 84)..... 17
- Synthesis of Immobilized Phospholipase A₂ Using
Organosilica Adsorbents
(N. G. Yevstratova, et al.; BIOORGANICHESKAYA
KHIMIYA, No 6, Jun 84)..... 18
- Protein Production by Hydrogen-Oxidizing Bacteria
(I. Treskov, et al.; EKONOMICHESKAYA GAZETA,
No 27, Jul 84)..... 18

ENVIRONMENT

- Wind Erosion in Turkmen SSR
(S. Bayramov; TURKMENSKAYA ISKRA, 10 Jul 84)..... 20

EPIDEMIOLOGY

- Toxicity Models for Legionella Pneumophila
(I. S. Tartakovskiy, et al.; ZHURNAL MIKROBIOLOGII,
EPIDEMIOLOGII I IMMUNOBIOLOGII, No 5, May 84)..... 21
- Characteristics of Epidemic Process in Viral Hepatitides A
and B on Territories With Different Morbidity Levels.
Part 1. Hepatitis A
(A. A. Kompaniyets, et al.; ZHURNAL MIKROBIOLOGII,
EPIDEMIOLOGII I IMMUNOBIOLOGII, No 5, May 84)..... 21

Antibody Dynamics in Carnivorous Mammals and Corvine Birds Infected With Francisella Tularensis (N. A. Sukhanov; ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII, No 5, May 84).....	22
Recovery of Flea Population Density of Daur Gophers After Burrow Disinfection in Transbaykal Plague Focus (A. I. Kardash, et al.; ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII, No 5, May 84).....	23
Putative Role of Birds in Dissemination of Zoonotic Infections in Southeastern Transbaykal (S. A. Khamaganov, et al.; ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII, No 5, May 84).....	23
Paper Method of Blood Sampling for Serologic Testing in Epidzootologic Studies in Plague Foci (M. A. Tyulembayev, et al.; ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII, No 5, May 84).....	23
Q-Fever in Odessa Oblast (V. I. Zubko, et al.; ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII, No 5, May 84).....	24
Immunization of Blood Donors With Inactivated, Concentrated and Purified Vaccine Against Tick-Borne Encephalitis for Production of Immune Blood Preparations (L. B. El'bert, et al.; VOPROSY VIRUSOLOGII, No 1, Jan-Feb 84).....	25
Outbreak of Arbovirus Infection in Tajik SSR Caused by Issyk-Kul Virus (Issyk-Kul Fever) (D. K. L'vov, et al.; VOPROSY VIRUSOLOGII, No 1, Jan-Feb 84).....	25
Detection of Antibodies to Enterovirus 71 in Sera of Moscow Residents (A. T. Kravchenko, T. N. Omel'chenko; ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII, No 3, Mar 84).....	26
Rift Valley Fever (S. G. Drozdov; ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII, No 3, Mar 84).....	26
Natural Focus of Leptospirosis in Krasnodar Kray Rice Fields and Means of Its Sanitation (Ye. V. Karaseva, et al.; ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII, No 3, Mar 84).....	27
Data of Serological Survey of Republic of Congo Population to Detect Antibodies to Orthopoxviruses. Report 1. Comparison of Methods of Study and Overall Results (S. S. Marennikova, et al.; ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII, No 3, Mar 84).....	27

GENETICS

- Genetic Engineering and Vaccines Produced From
Virus Proteins
(N. S. Dyachenko; MOLEKULYARNAYA BIOLOGIYA,
No 32, 1982)..... 29

IMMUNOLOGY

- Detoxication and Immunity Correction Methods Described
(V. Vakhidov; PRAVDA VOSTOKA, 14 Jun 84)..... 30
- Solid-Phase ELISA for Tularemia Antigen
(N. S. Umnova, et al.; ZHURNAL MIKROBIOLOGII,
EPIDEMIOLOGII I IMMUNOBIOLOGII, No 5, May 84)..... 31
- Immunogenicity of Inactivated Klebsiella Ozaenae
Cultures in Relation to Properties, Cultivation and
Storage of Starting Strains
(V. A. Molochko, et al.; ZHURNAL MIKROBIOLOGII,
EPIDEMIOLOGII I IMMUNOBIOLOGII, No 5, May 84)..... 31
- Radioimmunoassay Determination of HBsAG in Human γ -Globulin
Preparations
(S. O. Vyazov, et al.; ZHURNAL MIKROBIOLOGII,
EPIDEMIOLOGII I IMMUNOBIOLOGII, No 5, May 84)..... 32
- Endogenous Interferon in Treatment of Hepatitis B
(N. H. Farber, et al.; VOPROSY VIRUSOLOGII,
No 1, Jan-Feb 84)..... 32
- Immunological Activity and Toxicity of Oral Vaccine
Produced From Salmonella Minnesota Mutant RE
(A. V. Apollonin, et al.; ZHURNAL MIKROBIOLOGII,
EPIDEMIOLOGII I IMMUNOBIOLOGII, No 3, Mar 84)..... 33

MARINE MAMMALS

- Hydrodynamic Resistance in Dolphins
(Yu. Aleyev; TEKHNICA MOLODEZHI, No 6, Jun 84)..... 34

LASER EFFECTS

- Ischemic Heart Disease Treated With Pulsed Laser
(SOVETSKAYA LITVA, 24 Jun 84)..... 35
- Brief
Laser Instrument Production..... 36
- Use of Lasers in Treating Ischemic Heart Disease
(B. Samoylov; VECHERNAYA MOSKVA, 26 Jun 84)..... 37

Laser Application in Turkmen SSR (O. Babayev; TURKMENSKAYA ISKRA, 31 Jul 84).....	37
--	----

MICROBIOLOGY

Purification and Properties of Intracellular Nuclease From Competent Bacillus Subtilis (I. S. Belov, M. M. Belova; PRIKLADNAYA BIOKHIMIYA I MIKROBIOLOGIYA, No 2, Mar-Apr 84).....	39
Review of Book by Smirnov, V. V., Reznik, S. R. and Vasilevskaya, I. A., Sporogenous Aerobic Bacteria-- Producers of Biologically Active Substances [Sporoobrazuyushchiye Aerobnyye Bakterii - Produitsenty Biologicheski Aktivnykh Veshchestv], Kiev, Naukova, Dumka, 1982, 278 pp (V. I. Duda; PRIKLADNAYA BIOKHIMIYA I MIKROBIOLOGIYA, No 2, Mar-Apr 84).....	39
Invasive Character of Yersinia Pseudotuberculosis (G. Ya. Tseneva, et al.; ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII, No 5, May 84).....	40
Microbial Pathology and Physiology. Part 4. Economic and Metabolic Coefficients in Functional Assessment of Salmonella Typhi (V. A. Mel'nikova, I. A. Basnak'yan; ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII, No 5, May 84).....	40
Achromogenic Variants of Yersinia Pestis on Nutrient Media and in Animal Body (Z. Ye. Malinina, et al.; ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII, No 5, May 84).....	41
New Microbial Cytoquinine (I. V. Mishke, et al.; DOKLADY AKADEMII NAUK SSSR, No 5, Apr 84).....	41
Effect of Immobilization, Molecular Hydrogen, Ethane and Methane on Activity of Methane Generating Bacteria Associations (Ye. S. Pantskhava, et al.; PRIKLADNAYA BIOKHIMIYA I MIKROBIOLOGIYA, No 3, May-Jun 84).....	42
Inhibitor of Phospholipase C From Streptoverticillium Myconeptinicum (Ye. P. Yakobleva, et al.; PRIKLADNAYA BIOKHIMIYA I MIKROBIOLOGIYA, No 3, May-Jun 84).....	43
Nature of Pseudomonas Pseudomallei Antigens, Common for Some Species of Microorganisms (K. P. Gontar', et al.; ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII, No 3, Mar 84).....	43

MILITARY MEDICINE

- Tactics in Surgical Management of Gunshot Fractures
of Tubular Bones
(C. G. Karapetyan, V. P. Petrov; ORTOPEDIYA
TRAVMATOLOGIYA I PROTEZIROVANIYE, No 6, Jun 84)..... 44

- Transfusion of Absorbed Donor Blood Under Conditions of
Long-Term Storage and Severe Trauma
(I. I. Deryabin, et al.; VESTNIK KHIRURGII IMENI
I. I. GREKOVA, No 4, Apr 84)..... 51

MOLECULAR BIOLOGY

- Purification and Characterization of Bacteriophage
T4 RNA-Ligase
(M. M. Baklanov, et al.; PRIKLADNAYA BIOKIMIYA
I MIKROBIOLOGIYA, No 2, Mar-Apr 84)..... 56

- DNA-Like Duplexes With Repetitive Sequences. Part 8.
Synthesis and Properties of Restriction Endonuclease
EcoRII DNA Substrate Fragments
(Ye. S. Gromova, et al.; MOLEKULYARNAYA BIOLOGIYA,
No 2, Mar-Apr 84)..... 57

- Isolation and Characterization of Phage T7 DNA Fragment
Containing Promotor B With in Vivo and in Vitro Activity
(V. V. Kravchenko, et al.; MOLEKULYARNAYA BIOLOGIYA,
No 2, Mar-Apr 84)..... 57

- Distribution of Amino Acid Moieties in Primary Protein
Structure
(V. V. Poroykov, et al.; MOLEKULYARNAYA BIOLOGIYA,
No 2, Mar-Apr 84)..... 58

- T7 Phage RNA-Polymerase: Cloning and Sequencing of Gene
(N. A. Grachev, A. G. Pletnev; BIOORGANICHESKAYA
KIMIYA, No 6, Jun 84)..... 58

- Termination of DNA Transcription by Polynucleotide
(dA)•(dT) Inserted Into Plasmid pBR325
(L. Ya. Denisova, et al.; MOLEKULYARNAYA BIOLOGIYA,
No 3, May-Jun 84)..... 59

- Selection Alkylation of Polyadenylic Fragments of mRNA
of Krebs-2 Ascitic Carcinoma Cells by Alkylating
Derivatives of Nonathymidyluridine
(Ye. M. Ivanova, et al.; MOLEKULYARNAYA BIOLOGIYA,
No 3, May-Jun 84)..... 60

- Theoretical Conformational Analysis of MCD Peptide
(A. L. Lomize, Ye. M. Popov; MOLEKULYARNAYA
BIOLOGIYA, No 6, Nov-Dec 83)..... 60

Theoretical and Experimental Studies in Hinge Region of Human IgG Subclasses (A. I. Denesyuk, et al.; MOLEKULYARNAYA BIOLOGIYA, No 6, Nov-Dec 83).....	61
Reaction of Formaldehyde With Nucleic Acids and Their Structural Components in Presence of Primary or Secondary Amines (V. S. Volkov, et al.; MOLEKULYARNAYA BIOLOGIYA, No 6, Nov-Dec 83).....	61
New Type of DNA Modification. Site Specific Introduction of 3'-5'-Pyrophosphate Internucleotide Bonds (A. A. Purmal', et al.; BIOORGANICHESKAYA KHIMIYA, No 3, Mar 84).....	62
Primary Structure of E. Coli DNA Fragment Preceding Tryptophan Operon Genes (V. V. Gubanov, et al.; BIOORGANICHESKAYA KHIMIYA, No 3, Mar 84).....	63
Stability of Hybrid Plasmids With Polyoma Virus DNA Replicating in Saccharomyces Cerevisiae (N. A. Oganessian, et al.; MOLEKULYARNAYA BIOLOGIYA, No 1, Jan-Feb 84).....	63
Expression of Mutant Human α_2 -Interferon in Escherichia Coli (Yu. A. Ovchinnikov, et al.; MOLEKULYARNAYA BIOLOGIYA, No 1, Jan-Feb 84).....	64
3'-Terminal Nucleotide Sequence of Barley Stripe Mosaic Virus RNA (V. V. Rupasov, et al.; MOLEKULYARNAYA BIOLOGIYA, No 1, Jan-Feb 84).....	65
Reaction of BamHI Restriction Endonuclease With Synthetic Substrates Containing Complete or Partial Recognition Sequence (V. V. Zinov'yev, et al.; MOLEKULYARNAYA BIOLOGIYA, No 1, Jan-Feb 84).....	65
Perspectives and Achievements in Creation of Viral Vaccines by Genetic Engineering (T. I. Tikhonenko; MOLEKULYARNAYA BIOLOGIYA, No 1, Jan-Feb 84).....	66
Gene Cloning in Bacilli (P. M. Rabinovich, et al.; MOLEKULYARNAYA BIOLOGIYA, No 1, Jan-Feb 84).....	66

NONIONIZING ELECTROMAGNETIC RADIATION EFFECTS

- Medical Use of Magnetic Fields (original article entitled
Magnet Doctor)
(V. Adamenko; NEDELYA, No 21, 21-27 May 84)..... 68

PHARMACOLOGY AND TOXICOLOGY

- Danger of Fad Drugs, Folk Remedies
(M. Koshchak; RADYANS'KA UKRAYINA, 21 Jun 84)..... 69
- Bacteriocins: Prospective Prophylactic and Therapeutic
Use
(L. P. Blinkova; ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII
I IMMUNOBIOLOGII, No 5, May 84)..... 72
- Antigenicity of Nitroaromatic Derivatives of Polyethylene
Glycol
(V. A. Kabanov, et al.; ZHURNAL MIKROBIOLOGII,
EPIDEMIOLOGII I IMMUNOBIOLOGII, No 5, May 84)..... 72
- Isolation and Purification of Bacterial Ribosomes From
Endotoxin by Polyethylene Glycol
(V. I. Levenson, et al.; ZHURNAL MIKROBIOLOGII,
EPIDEMIOLOGII I IMMUNOBIOLOGII, No 5, May 84)..... 73
- Stimulation of Antibacterial Immunity in Experimental Mouse
Salmonellosis by Sea Cucumber Triterpene Glycosides
(A. M. Sedov, et al.; ZHURNAL MIKROBIOLOGII,
EPIDEMIOLOGII I IMMUNOBIOLOGII, No 5, May 84)..... 74
- Certain Properties of Escherichia Coli α -Hemolysin
(V. V. Favorov, et al.; ZHURNAL MIKROBIOLOGII,
EPIDEMIOLOGII I IMMUNOBIOLOGII, No 5, May 84)..... 74
- Quantitative Spectrophotometric Determination of Isonitrosine
(V. V. Trokhymchuk, L. D. Ryabikh; FARMATSEVTYCHNYY
ZHURNAL, No 2, Mar-Apr 84)..... 75
- Synthesis and Biological Activities of Aryl-(Heteryl-)
Hydrozone Derivatives of Arenesulfohydrazide Acid Succinate
(V. P. Chernykh, et al.; FARMATSEVTYCHNYY ZHURNAL,
No 2, Mar-Apr 84)..... 75
- Calorimetric Studies of Thermal Toxin Denaturation
(N. N. Khechinashvili, V. I. Tsetlin;
MOLEKULYARNAYA BIOLOGIYA, No 3, Mar-Jun 84)..... 76
- New Low Molecular Weight Protein Effector of Human
Complement From Venom of Central Asian Cobra Naja Naja Oxiana
(L. V. Kozlov, et al.; BIOORGANICHESKAYA KHIMIYA,
No 3, Mar 84)..... 76

Activating Effect of Adrenalin, Prednisolone and Vincristine at Remote Periods of Tick-Borne Encephalitis Persistence (T. V. Frolova, V. V. Pogodina; VOPROSY VIROSOLOGII, No 1, Jan-Feb 84).....	77
Drugs Containing Fluorine (Yu. A. Fialkov, L. M. Yagupol'skiy; FIZIOLOGICHESKI AKTIVNYE VESHCHESTVA, No 14, 1982).....	78
Synthesis and Antitumor Properties of Amidophosphoric Acid Derivatives (I. M. Loseva, et al.; FIZIOLOGICHESKI AKTIVNYE VESHCHESTVA, No 14, 1982).....	78
Antimicrobial Activity of Pyrazole Derivatives (A. G. Makhsumov, et al.; FIZIOLOGICHESKI AKTIVNYE VESHCHESTVA, No 14, 1982).....	79
Effect of Cocarboxylase and Lipoic Acid on Excretory Function of Liver in Rabbits Exposed to Carbon Tetrachloride Poisoning (G. N. Voytenko, et al.; FIZIOLOGICHESKI AKTIVNYE VESHCHESTVA, No 14, 1982).....	80
PHYSIOLOGY	
Yerevan Scientists' Conference (KOMMUNIST, 1 Jul 84).....	81
Ultrasonic Monitor of Physiological Pressure Responses (VECHERNYAYA MOSKVA, 5 Jul 84).....	82
Conference of Federation of European Biochemical Societies (Ye. Manucharova, M. Khromchenko; IZVESTIYA, 29 Jun 84).....	83
High Altitude Physiology Research at Kirghiz Institute (S. Daniyarov; SOVETSKAYA KIRGIZIYA, 18 May 84).....	83
Adaptation Research Featured at Physiology Forecasting Symposium (SOVETSKAYA KIRGIZIYA, 15 May 84).....	84
PUBLIC HEALTH	
Bulgarian Public Health Professionals Visit Ukraine (RADYANS'KA UKRAYINA, 7 Jun 84).....	86
Basic Directions in Development of Health Care and Medical Sciences in Ukrainian SSR (A. Ye. Romanenko; VRACHEBNOYE DELO, No 6, Jun 84).....	87

Brief	
Medical Complex.....	96
Problems in Construction of Moscow Health-Care Facilities (B. Guro; MOSKOVSKAYA PRAVDA, 4 Aug 84).....	97
Human Adaptation in High-Mountaineous Areas (A. Aydaraliyev; SOVETSKAYA KIRGIZIYA, 8 Aug 84).....	97
Problems of Medical Staffing in Rural Areas (L. Likhonin; SEL'SKAYA ZHIZN', 2 Aug 84).....	98
Dynamics of Population Immunity to Influenza Viruses A and B After Introduction of Complex System of Influenza Control in City (Yu. G. Kustikova, V. M. Gagarinova; ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII, No 3, Mar 84).....	99
Drug Production Delayed (G. Denisova; MEDITSINSKAYA GAZETA, 1 Jun 84).....	99
Antimicrobial Arenarin Ointment for Eye Burns (V. Smirnov, A. Negrash; MEDITSINSKAYA GAZETA, 27 Jun 84).....	100
Medical Computer Overhauled for Multiple Users (Yu. Zhigaylov; PRAVDA, 4 May 84).....	101
Improvement in Rural Pediatric Health Services (A. I. Avramenko; SOVETSKOYE ZDRAVOOKHRANENIYE, No 5, May 84).....	101
Fraud and Corruption in Tikhvin, Vyborg Secondary Medical Schools (Yu. Kirillov; LENINGRADSKAYA PRAVDA, 22 Jul 84).....	102
Leningrad Emergency Medical Sciences (Ye. Bogoslovskaya, et al.; LENINGRADSKAYA PRAVDA, 5 Aug 84).....	102
RADIATION BIOLOGY	
Biological Research With IBR-2 Fast-Neutron Reactor (SOVETSKAYA ROSSIYA, 9 Jun 84).....	104
Sterilization of Enzyme Preparations by Combined Radiation Methods (I. I. Samoylenko, et al.; PRIKLADNAYA BIOKHIMIYA I MIKROBIOLOGIYA, No 2, Mar-Apr 84).....	105

Effects of γ -Irradiation on Immunobiological and Immunochemical Properties of Cholera Exotoxin. Part 2. Immunogenicity of Non-Purified Irradiated Toxin Filtrate (I. V. Rubtsov, et al.; ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII, No 5, May 84).....	105
--	-----

Radiosensitivity of Mongolian Gerbils Grown in Vivaria (O. P. Domareva, et al.; DOKLADY AKADEMII NAUK SSSR, No 5, Apr 84).....	106
--	-----

VETERINARY MEDICINE

Modern Approaches to Developing Virus Control Vaccines and Diagnostic Reagents (V. N. Syurin, V. P. Karelin; VETERINARIYA, No 6, Jun 84).....	107
Simultaneous Aerosol Vaccination of Chicks Against Infections Laryngeal Tracheitis and Newcastle Disease (Yu. S. Dutko, et al.; VETERINARIYA, No 6, Jul 84).....	107
Diagnosis of Viral Transmissible Gastroenteritis of Swine (S. A. Kir'yanov; VETERINARIYA, No 6, Jun 84).....	108
Improving Training for Veterinary Physicians (M. S. Zhakov; VETERINARIYA, No 6, Jan 84).....	108
Monitoring Immunogenicity of Teschen's Disease Vaccine (V. I. Zhesterev, et al.; VETERINARIYA, No 4, Apr 84).....	109
Trial of Viral Vaccine From Strain BOR-74 VGNKI (V. I. Shul'ga; VETERINARIYA, No 4, Apr 84).....	109
Control of Tick Carriers of Parasitic Blood Disease Pathogens (P. T. Kan; VETERINARIYA, No 4, Apr 84).....	110
First International Seminar on General Epizootology of CEMA Member Nations (I. A. Bakulov; VETERINARIYA, No 4, Apr 84).....	110

VIROLOGY

Japanese Encephalitis Virus Persistence in L929 Cells. Correlation of Viral and Cellular Factors (L. V. Uryvayev, et al.; VOPROSY VIRUSOLOGII, No 1, Jan-Feb 84).....	112
Indirect Hemagglutination Reaction for Indication of Hemorrhagic Fever With Renal Syndrome (HFRS) Virus and Laboratory Diagnosis of Disease (S. Ya. Gaydamovich, et al.; VOPROSY VIRUSOLOGII, No 1, Jan-Feb 84).....	112

Induction of TS-Mutations of Alphaviruses by N-Methyl-N-Nitro-N-Nitrosoguanidine During Action on Replicating Virus (L. M. Shablinskaya, Ya. Ya. Tsilinskiy; VOPROSY VIROSOLOGII, No 1, Jan-Feb 84).....	113
---	-----

Immunoelectron Microscopy of Viruses of Tick Encephalitis Complex (Yu. P. Kadoshnikov, et al.; VOPROSY VIRUSOLOGII, No 1, Jan-Feb 84).....	113
---	-----

CONFERENCES

All-Union Conference: "Early Diagnosis and Prevention of Cardiovascular Diseases" (A. N. Britov, et al.; KARDIOLOGIYA, No 6, Jan 84).....	115
--	-----

Working Conference of the All-Russian Society of Cardiologists and Academic Council on Cardiovascular Diseases Under the RSFSR Ministry of Health: "Circulatory Insufficiency and New Methods of Treatment and Diagnosis in Cardiology" (24-26 May 1983, Kostroma) (S. A. Koroleva; KARDIOLOGIYA, No 6, Jun 84).....	127
--	-----

Soviet Biochemistry Advances Surveyed at Conference Opening (M. Sakhanovskaya, V. Likholtov; MEDITSINSKAYA GAZETA, 27 Jun 84).....	131
---	-----

MISCELLANEOUS

Scientific Activity of Armenian Order of Red Banner of Labor Scientific Research Institute of Epidemiology, Virology and Medical Parasitology imeni A. B. Aleksanyan (for the 60th Anniversary of the Foundation of this Institute) (K. M. Dekhtsunyan; ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII, No 2, Feb 84).....	133
--	-----

Institute of Bioorganic Chemistry in Novosibirsk (MOSKOVSKAYA PRAVDA, 30 Jun 84).....	136
--	-----

Urgent Problems of Forensic Medical Service in Light of Decisions of June (1983) and December (1983) Plenums of CC CPSU (A. P. Gromov, I. Ye. Panov; SUDEBNO-MEDITSINSKAYA EKSPERTIZA, No 2, Apr-May-Jun 84).....	137
--	-----

Development and Perfection of Coordination of Scientific and Practical Activity in Legal Expert Opinion Institutions (A. R. Shlyakhov, M. N. Rostov; SUDEBNO-MEDITSINSKAYA EKSPERTIZA, No 2, Apr-May-Jun 84).....	144
--	-----

Marxist-Leninist World View and Ideological Struggle
in Medical Science

(N. F. Loginov, V. P. Petlenko; VESTNIK KHIRURGII
IMENI I. I. GREKOVA, No 4, Apr 84)..... 149

UDC 547.822.5.6+631.981.98(088.8)

SYNTHESIS AND GROWTH-REGULATING ACTIVITY OF DERIVATIVES OF TETRACHLOROPYRIDINE
WITH OXYGEN-CONTAINING FUNCTIONAL SUBSTITUENTS

Kiev FIZIOLOGICHESKI AKTIVNYE VESHCHESHTVA in Russian No 14, 1982
(manuscript received 10 Dec 80) pp 31-35

KUKHAR', V. P., PAVLENKO, A. F., KARABANOV, Yu. V., SOLOGUB, L. S. and
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Sciences

[Abstract] Proceeding from the fact that various chlorine-substituted pyridines possess properties as plant growth regulators and stimulators and herbicides, and also in some cases simultaneously display insecticidal and fungicidal activity, oxygen-containing derivatives of tetrachloropyridine that are structural analogues of the highly effective herbicides picforam and dakstron (4-oxy-2,3,5-tri-chloropyridine) were synthesized in the search for new pesticides and plant growth regulators. Six synthesized substances (3,4,5,6-tetrachloropyridone-2; (2,3,5,6-tetrachloropyridyloxy) ethanol; 4-amino-2,3,5,6-tetrachloropyridine; 2-amino-3,4,5,6-tetrachloropyridine; 4-benzyloxy-2,3,5,6-tetrachloropyridine; the ethyl ether of 2,3,5,6-tetrachloropyridyl-4-glycolic acid) were tested in lettuce and oats. It was found that they inhibited growth processes in lettuce (dicotyledonous) more strongly than in oats (monocotyledonous). In large doses they may act as herbicides, and in low doses as plant growth regulators. The substances displayed less activity than the baseline reference substance for herbicidal activity (picforma) and greater activity than the baseline reference substance for growth regulation (etrel (2-chloroethyl-phosphonic acid)). It is concluded that the tested substances do not show marked herbicidal activity within the range of concentrations studied and are not as good as the baseline reference substance in terms of plant damage. They are, however, good growth regulators and deserve further study under field conditions. Figures 4; references 14 (Russian).
[9642-1558]

CHITIN: BIOLOGICAL FUNCTIONS AND PRACTICAL APPLICATIONS

Moscow PRILADNAYA BIOKHIMIYA I MIKROBIOLOGIYA in Russian Vol 20, No 2,
Mar-Apr-84 (manuscript received 16 Nov 82) pp 147-160

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[Abstract] A review is presented of largely Western literature on the isolation, chemistry and biology of chitin, and of its present and potential practical applications in medicine, agriculture and industry. Chitin is generally obtained by treatment with strong (50%) alkali at high temperatures (150°C), while chitosan is derived by subsequent deacetylation. Chitin derivatives are used extensively as additives in the textile and paper industries, as chelating agents that are in some cases more effective than EDTA, as fillers and adhesive, and in the production of deodorants and agglutinating agents, to name a few industrial applications. In medicine chitosan has been suggested as a selective membrane for artificial kidneys, while other chitin derivatives find use as anticoagulants, in the preparation of metabolizable drug vehicles, as factors promoting wound healing, and as growth inhibitors for malignant cells. More recently, various chitin-based derivatives have found use as specific adsorbents and carriers for immobilized enzymes and cells. Figures 3; references 65: 14 Russian, 51 Western. [1516-12172].

LOCATION AND IDENTIFICATION OF NUCLEOSIDE PHOSPHATE BONDED WITH SHELL PROTEIN OF T4 BACTERIOPHAGE

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 275, No 5, Apr 84
(manuscript received 16 Nov 83) pp 1224-1226

SERYSHEVA, I. I., VEN'YAMINOV, S. YU., TURKIN, A. I., RODIKOVA, L. P., SELIVANOV, N. A. and POGLAZOV, B. F., Institute of Biochemistry imeni A. N. Bakh, USSR Academy of Sciences, Moscow; Protein Institute, USSR Academy of Sciences, Pushchino, Moscow Oblast; Moscow State University imeni M. V. Lomonosov; All-Union Scientific Research Institute for Applied Molecular Biology and Genetics, VASKhNIL, Moscow

[Abstract] The contracting tail shell of the T4 bacteriophage is one of the main components of the viral part that introduce the DNA phage into a cell, bringing a structural reorganization of the tail shell as length decreases from 950 to 350 Å and diameter increases by 30%. The present article reports isolation of products of gene 18 (PG 18) in monomer and biologically active forms and determination of nucleoside phosphate bonded to it. An amber-mutant phage T4 23 (am N11) was used to separate PG 18; T4 phages were produced by cultivating a non-permissive strain of *E. coli* and infesting it with the phage 5 times. Oxidation extraction was used to separate the nucleoside phosphates bonded to PG 18. Final identification was accomplished by elution. Results indicated that every shell protein sub-unit of the composition of the tail of the T4 bacteriophage is bonded to one molecule of guanosine diphosphate, whose functional role requires further research. Figures 2; references 10: all Western.

[708-12131]

UDC 577.151.04:577.152.313

EFFECTS OF BIOLOGICALLY ACTIVE COMPOUNDS ON $(Ca^{++}-Mg^{++})$ -DEPENDENT ATPase OF SARCOPLASMIC RETICULUM RECONSTRUCTED WITH SYNTHETIC PHOSPHOLIPIDS

Moscow MOLEKULYARNAYA BIOLOGIYA in Russian Vol 18, No 2, Mar-Apr 84
(manuscript received 18 Nov 82; in final form 1 Mar 83) pp 504-511

TAT'YANENKO, L. V., GROMOVA, L. A. and MOSHKOVSKIY, Yu. Sh., Scientific Research Institute for Biological Testing of Chemical Compounds, Kupavna, Moscow Oblast

[Abstract] Rabbit muscle preparations were employed in studies on the effects of synthetic phospholipids (e.g., 1,2-dipalmitoyl-racglycero-2-diethylphosphate) and other triglyceride derivatives, incorporated into sarcoplasmic reticulum (SR) via ultrasonication, on the activity of $(Ca^{++}-Mg^{++})$ -dependent ATPase (I) and active Ca^{++} transport across the SR. The degree of I activity was predicated on the structure of the polar head of the phospholipid, and the nature of the fatty acids and the length of their hydrocarbon chain. Furthermore, various biologically active agents (chlorpromazine, $BeSO_4$, 5-sulfo-8-mercapto-quinolate platinum) inhibit the activity of I in the modified SR to a much

greater extent than they do in the native SR, which was ascribed to the diminished mobility of the hydrophobic domains in the modified SR. Studies on the temperature-dependence of the activity of I in the native and modified SR demonstrated that the effects of the agents were due to changes in the microviscosity at the proteinlipid interphase in the SR. This resulted in conformational changes in the active sites of I, which affected the catalytic activity. Figures 4; references 17: 16 Russian, 1 Western.
[1535-12172]

UDC 577.352.334

RELAY MODEL FOR LIPID PEROXIDATION IN BIOLOGICAL MEMBRANES

Moscow MOLEKILYARNAYA BIOLOGIYA in Russian Vol 18, No 2, Mar-Apr 84
(manuscript received 28 Jan 83) pp 512-524

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[Abstract] A novel approach is taken to a theoretical analysis of lipid peroxidation in dense liquid membranes by assuming that the primary mechanism involves oxygen-lacking free radical-sites in the hydrocarbon domains. Such sites are proposed to possess a high degree of intra- and intermolecular mobility in the hydrocarbon domain of the biological membrane. Mobility of the radicals involves gradient effects as well as molecular structural features and localization of unsaturated bonds in the membrane. Inhibition of lipid peroxidation is regarded as reflecting decay of the oxygen-free sites on antioxidant molecules. Furthermore, natural antioxidants (e.g., tocopherols) are considered to function as channels which funnel the free radicals from the hydrocarbon moiety in a relay manner into an energetically more favorable situation in the polar portion of the antioxidant molecule. This hypothesis of lipid peroxidation departs from the more commonly held view regarding analogy to liquid-phase oxidation of hydrocarbons, and is more closely attuned to processes resembling oxidation of solid polymers. Figures 2; references 40: 14 Russian, 26 Western.
[1535-12172]

UDC 577.112.6:577.152.34'14:542.953.2

PEPTIDE SYNTHESIS IN AQUEOUS MEDIA

Moscow BIOORGANICHESKAYA KHIMAYA in Russian Vol 10, No 6, Jun 84
(manuscript received 7 Sep 83; in revised form, 1 Nov 83) pp 725-750

SAMOYLOVA, N. A., DAVIDOVICH, Yu. A. and ROGOZHIN, S. V., Institute of Hetero-organic Compounds imeni A. N. Nesmeyanov, USSR Academy of Sciences, Moscow

[Abstract] This is a detailed literature review. An aqueous medium, at physiologically-appropriate pH, is seen as optimal for synthesis of peptides because it helps to avoid denaturation of substances of a protein nature during

the synthesis. Enzymes have been exploited in recent years to synthesize peptide substances. Other directions pursued have included insertion and removal of protective groups in the molecules, search for new hydrophilic protective groups and chemical synthesis--in aqueous media--using low-molecular-weight reactants and polymer carriers. Although some Soviet contributions are cited in this review, the majority of reports examined are of Western origin. Research reviewed is divided into three general areas. The first segment is concerned with the use of enzymes in peptide synthesis and deals with proteolytic enzymes, catalysis, the insertion and removal of protective groups with the help of enzymes. The second segment deals with chemical methods of synthesis, e.g., with low molecular weight reactants, amino acids, condensation (e.g., use of the condensing agent N,N^1 -carbonylimidazole), esters, hydroxylamines, N-acylaminoacids, polymers as protective agents of terminal groups and activators. The third general area reviewed is the use of hydrophilic protective groups, e.g., N-protected aminogroups. It is suggested that chemical methods of peptide synthesis promise more success than enzymatic methods. Figure 1; references 232: 23 Russian, 209 Western. [1538-8586]

UDC 577.150.8

PRODUCTION OF INSOLUBLE CONJUGATES OF PHOSPHOLIPASE A_2 AND STAPHYLOCOCCUS TOXIN

Tashkent UZBEKSKIY BIOLOGICHESKIY ZHURNAL in Russian No 3, May-Jun 84
(manuscript received 21 Sep 83) pp 3-5

SULTANOV, Kh. K., YAKUBOV, I. T., MUKSIMOV, F., TUYCHIBAYEV, M. U. and RAKHIMOV, M. M., Central Asia Medical Pediatric Institute; Tashkent Order of Labor's Red Banner State University imeni V. I. Lenin; Institute of Biochemistry, UzSSR Academy of Sciences

[Abstract] A description is given of the preparation, without recourse to a carrier, of the insoluble title conjugates. The biologically-active toxin used was obtained from the Institute of Epidemiology and Microbiology imeni Gamelaya, USSR Academy of Medical Sciences; the enzyme was purified phospholipase A_2 from the poison of a large hornet. The method used was an adaptation of unpublished procedure. The conjugate was derived as a precipitate from the toxin-glutaric aldehyde-enzyme reaction system of that method. It exhibited an adequately-high phospholipase activity and could be used in immunochemical reaction with antibodies to the toxin. Study was made of such conjugates for hemolytic activity upon erythrocytes. It is suggested that the conjugates be used in immunoenzymatic analysis. Figures 2; references 6 (Russian). [1086-8586]

CULTURAL-MORPHOLOGICAL CHARACTERISTICS OF PESTICIDE RESISTANT AND AUXOTROPHIC STRAINS OF VERTICILLIUM DAHLIAE KLEB

Tashkent UZBEKSKIY BIOLOGICHESKIY ZHURNAL in Russian No 3, May-Jun 84
(manuscript received 24 Oct 83) pp 11-13

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Academy of Sciences

[Abstract] Pesticide-resistant strains of the title pathogens were obtained by serial passage (8 to 10 times) in media containing increasing dosages of fungicides (e.g., benomil or uzgen). *V. dahliae* has a broad range of variability; study of the frequency of change in strains resistant to pesticides indicated that formation of auxotrophic forms from the resistant strains is increased by a factor of 1.5-2 as compared with controls. Formation of the auxotrophic strains was carried out by a published method [Zakharov, et al., 1976]. The resistant strains grew on complete or minimal media, the auxotrophic, only on a complete medium. Tabulations of the cultural-morphological properties of the resistant and the auxotrophic strains are given. The auxotrophic strains were found to be especially virulent to cotton. It is suggested that such strains can be studied to gain insight into fungicide-induced variability of pathogens. References 2 (Russian).
[1086-8586]

UDC 547-993:612.44

LIGHT AND TRANSMISSION MICROSCOPY OF POISON GLANDS OF GREEN TOAD

Tashkent UZBEKSKIY BIOLOGICHESKIY ZHURNAL in Russian No 3, May-Jun 84
(manuscript received 5 Jul 83) pp 51-54

KADYROV, I. K. and LEONOV, L. F., Tashkent Order of Lenin's Red Banner State
University imeni V. I. Lenin

[Abstract] While the composition of toad poisons has been well-studied, structure of the producing glands has not been given much attention. This article describes a study of those glands using light microscopy and transmission-electron-microscopy (Hitachi H-600 electron microscope). Pieces of skin taken from the shoulder and hip area of toads captured in Tashkent were studied; these dorsal areas are rich in number of poison glands whereas such glands are not found on the ventral surface of the toad body. The greatest producer of poison is the supra-scapular glands (a term suggested by V. I. Zakharov). A detailed morphological and histological description of the supra-scapular gland, and, also, of a small poison gland of the toad is presented, with illustration of ultrastructure. Secretory functioning of the poison glands is indicated. Figures 2; references 3 (Russian).
[1086-8586]

SIXTEENTH CONFERENCE OF FEDERATION OF EUROPEAN BIOCHEMICAL SOCIETIES

Moscow IZVESTIYA in Russian 27 Jun 84 p 3

MANCHAROVA, Ye. and KHROMCHENKO, M., special correspondents IZVESTIYA

[Abstract] Discussions of rhodopsin and photosynthesis presented at symposia and round-table discussions at the conference are described and discussed. Topics of these discussions included the structure of the visual purple molecule, rhodopsin-containing bacteria which, in essence, represent a natural solar battery which transforms light energy into chemical substance and the possibilities of applying these concepts to generation of vast amounts of energy. Discussion of biorhodopsin in relation to bioengineering emphasized the importance of application of bioengineering to relieve hunger and starvation, provide shelter and energy of control disease. The possibility of another industrial revolution based on biological knowledge and spearheaded by genetic engineering is discussed.
[764-2791]

UDC 577.155.2:543.544

AFFINITY CHROMATOGRAPHY OF NUCLEASES

Moscow BIOORGANICHESKAYA KHIMIYA in Russian Vol 10, No 3, Mar 84
(manuscript received 13 May 83; after revision 9 Aug 83) pp 293-317

BANNIKOVA, G. Ye., VARLAMOV, V. P. and ROGOZHIN, S. V., Institute of Hetero-organic Compounds imeni A. N. Nesmeyanov, USSR Academy of Sciences, Moscow

[Abstract] The affinity chromatography of exo- and endonucleases is extensively reviewed. While stationary supports with all the required properties for this type of chromatography do not exist, agarose and its derivatives, cellulose and its derivatives, polyacrylamide and modified porous glass or macroporous silica, particularly those covered with a hydrophilic polymer, have been successfully used. Since the first reported separation, in 1968, utilizing 3'-(4-aminophenylporphoryl)-thymidine-5'phosphate as a stationary ligand, similar uridine, guanosine and inosine derivatives have been bonded to the support via their phosphate groups. Biospecific sorbents have also been prepared with nucleotide ligands bonded through the ribose or the heterocyclic base. Concanavalin-A sepharose has been used to purify nucleases and phosphodiesterases. Another biospecific sorbent with a nonnucleotide ligand contained the phosphodiesterase inhibitor O-(4-nitrophenyl)-O'phenylthiophosphate and was also used in phosphodiesterase chromatography. Heparin sepharose and hexylamine sepharose are useful in nuclease purification, while cibacron blue is an appropriate ligand for phosphodiesterases. Affinity chromatography can be used to quantitatively determine the specificity of nuclease-ligand binding. Figures 6; references 95: 13 Russian, 82 Western.
[1521-12126]

BIOSYNTHETIC ¹⁹F AND ¹⁴C- DERIVATIVES OF BACTERIORHODOPSIN

Moscow BIOORGANICHESKAYA KHIMIYA in Russian Vol 19, No 3, Mar 84
(manuscript received 14 Sep 83) pp 333-340

KURYATOV, A. B., OVECHKINA, G. V., ALENYCHEVA, T. N., MINAYEVA, L. P. and
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[Abstract] In order to improve the NMR properties of bacteriorhodopsin, *Halobacterium halobium* (R1M1) was grown on synthetic medium containing ¹⁴C labeled or fluorine-labeled amino acids. After purification and complete acid hydrolysis the extent of radioactivity in the bacteriorhodopsin amino acids was measured. Bacteria cultured in the presence of ¹⁴C isoleucine had substantial radioactivity in the lipid fraction and some in the retinal. Results with ¹⁴C proline, phenylalanine and tyrosine bacteriorhodopsin indicated that the use of these amino acids, labeled with ¹⁴C, would give products suitable for ¹⁴C-NMR. Bacteriorhodopsin labeled with ¹⁴C phenylalanine was produced. With fluorinated amino acids, protein yield was a factor of 2.5-4.5 times less than in the presence of the natural amino acids. The ratio of labeled to unlabeled amino acid in the total protein obtained was 20:1 for tryptophan, 1:1 for phenylalanine and 2:3 for tyrosine. The ¹⁹F-NMR spectrum of 5-fluorotryptophan bacteriorhodopsin consisted of eight signals, corresponding to the number of tryptophan residues in the protein. Determination of absorption spectra, circular dichroism, spectrophotometric titration and laser infrared spectra indicated that the structure of the chromophoric center is not affected by fluorine labeling. Small changes in fluorescence may be due to structural alterations. The data do not confirm conclusions of other authors about the participation of tyrosine in the chromophoric group. The fluorinated bacteriorhodopsin had a factor of 2-3 less activity in photoinduced pH changes, compared to native pigment, possible due to slightly disturbed peptide stacking. Figures 4; references 21: 2 Russian, 19 Western.
[1521-12126]

UDC 577.112.4:577.352.332:577.354.23

CHEMICAL MODIFICATION OF SULFHYDRYL GROUPS IN RHODOPSIN. LOCALIZATION OF DISULFIDE BONDS

Moscow BIOORGANICHESKAYA KHIMIYA in Russian Vol 10, No 3, Mar 84
(manuscript received 20 Oct 83) pp 341-357

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[Abstract] In order to determine the location of the disulfide bonds in cattle retina rhodopsin, the effect of chemical modification on the native molecule

was studied. Using stepwise degradation with thermolysis and cyanogen bromide, sephadex chromatography and automatic peptide sequencing, it was demonstrated that N-ethyl[2,3-¹⁴C]maleimide reacts with cysteine 316. Zwittergent was used to solubilize thermolysin fragment 1, after which tryptic digestion, HPLC and automatic Edman degradation demonstrated that cysteine 140 also reacts with the maleimide. By blocking the "dark" sulfhydryl groups with N-ethylmaleimide, irradiating discs previously incubated with thermolysin, reacting the irradiated rhodopsin with [1-¹⁴C]-iodoacetate and identifying the cyanogen bromide fragments, cysteine 322 and cysteine 321 were shown to become accessible to iodoacetate after irradiation. After inversion with papain and morpholinoethane sulfoxide, cysteines 185 and 187 reacted with labeled iodoacetate, indicating that they are on the internal membrane side of the peptide in the native state. In order to locate the disulfide bridge of the extremely hydrophobic rhodopsin, exhaustive carboxymethylation, solubilization of the fragments with SDS and urea, cyanogen bromide cleavage and chromatography were used. The data indicate that the disulfide bridge is between cysteines 110 and 167, that it is retained after irradiation and that it is not accessible to reducing agents. The location of the bridge was confirmed using chymotrypsin followed by thermolysin. Cysteine 264 is the site of the disulfide bridge between the dimers produced with thermolysin. Affinity chromatography demonstrated that in sodium cholate, light-induced fragment dissociation does not occur without reduction of the disulfide bond. Figures 12; references 30: 5 Russian; 25 Western.
[1521-12126]

UDC 577.152.61:578.811.1

KINETICS OF ATP-PYROPHOSPHATE ISOTOPE EXCHANGE CATALYZED BY PHAGE T4 RNA LIGASE

Moscow MOLEKULYARNAYA BIOLOGIYA in Russian Vol 18, No 1, Jan-Feb 84
(manuscript received 24 May 83) pp 227-233

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[Abstract] Standard enzyme kinetics were applied to an analysis of ATP-pyrophosphate isotope exchange in a reaction catalyzed by RNA ligase (EC 6.5.1.3) isolated from E. coli infected with bacteriophage T4 amN82. Determination of the rate constants and the equilibrium constants facilitated analysis of the first stage of the reaction, i.e., interaction of the ligase with ATP to form the adenylated enzyme, and the effects of the substrates. The tabulated data showed that the exchange was little inhibited by the acceptor A(pA)₂ and the donors pAp, p(Ap)₃ and pCp. However, comparison of the experimental data with theoretical calculations showed that only the dimagnesium salts of the substrates-- Mg₂-ATP and Mg₂-PP--participate in the reaction and affect the initial rate of ATP-PP exchange, and not the monomagnesium salts (Mg-ATP⁺, Mg-PP⁺). Figures 4; references 16: 8 Russian, 8 Western.
[1534-12172]

RESTRICTION ENDONUCLEASE EcoRV: PHYSICAL AND CATALYTIC PROPERTIES OF HOMOGENOUS ENZYME

Moscow MOLEKULYARNAYA BIOLOGIYA in Russian Vol 18, No 1, Jan-Feb 84
(manuscript received 12 Jul 83) pp 197-204

KUZ'MIN, N. P., LOSEVA, S. P., BELYAYEVA, R. Kh., KRAVETS, A. N., SOLONIN, A. S., TANYASHIN, V. I. and BAYEV, A. A., Institute of Biochemistry and Physiology of Microorganisms, USSR Academy of Sciences, Pushchino, Moscow Oblast

[Abstract] Standard techniques of enzyme isolation and purification were utilized to obtain a homogenous form of EcoRV restriction endonuclease. EcoRV is an enzyme with a MW of 25,000 and differs antigenically from EcoRI and EcoRII. EcoRV acts on the GATATC site in DNA, with full activity evident at pH 6.5-8.5 and within a temperature range of 30-45°C. Mn^{++} and Mg^{++} ensure full activity of EcoRV; Co^{++} and Zn^{++} allow for low activity, while no activity is evident in the presence of the same concentration (0.5 mM) of Ni^{++} or Cd^{++} . The enzyme is active in the monomeric state, with some retention of activity (50%) after exposure to 65°C; in the presence of the DNA substrate less than 25% of the activity is lost. EcoRV is active on glycosylated and 5-hydroxymethylcytosine-containing DNA of T-even phages, while specificity for methylated phage λ DNA is reduced. The latter fragments form recombinants at the EcoRV site with plasmid pBR322. Figures 5; references 15: 5 Russian, 15 Western.
[1534-12172]

UDC 577.152.277:577.152.211

SPECIFICITY OF NOVAL RESTRICTASES AND METHYLASES: UNUSUAL MODIFICATION OF CYTOSINE AT C₄

Moscow MOLEKULYARNAYA BIOLOGIYA in Russian Vol 18, No 1, Jan-Feb 84
(manuscript received 8 Aug 83) pp 115-129

YANULAYTIS, A. A., STAKENAS, P. S., PYATRUSHITE, M. P., BITINAYTE, Yu. B., KLIMASHAUSKAS, S. Y. and BUTKUS, V. V., All-Union Scientific Research Institute of Applied Enzymology, Vilnius

[Abstract] Details are provided on the isolation and growth of *Citrobacter freundii* and *Escherichia coli* cultures, with subsequent ultrasonication and isolation and identification of 14 restriction endonucleases and four methylases. The activities and specificities of these enzymes were analyzed by comparing their effects on DNA substrates with the effects exerted by enzymes with well-defined target sites, and are summarized in tabular form. A novel restriction endonuclease from *C. freundii*, Cfr10I, was found to cleave at the following sequence: 5'PuCCGGPy. The methylases were found to recognize the same site

as the restrictases isolated from the same strain. In addition, methylation with the methylases from *C. freundii*--MCfrI and MCfr10I--resulted in the formation 5-methylcytosine, while MCfr6I and MCfr9T led to the formation of N⁴-methylcytosine. Figures 11; references 27: 4 Russian, 23 Western.
[1534-12172]

PROPORTIONS OF HUMAN ARM (APPLYING CONCEPTS OF ROBOTICS IN BIOMECHANIS)

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 276, No 6, Jun 84
(manuscript received 4 Feb 83) pp 1352-1355

KOBRINSKIY, A. A. and KOBRINSKIY, A. Ye., Institute of Machine Science imeni
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[Abstract] After reviewing work on the proportions of the human arm in the context of the design of manipulative robots that mimic the movements of the human arm, results are presented from an analysis of this problem for the purpose of applying the concepts of robotics to evaluate other qualities of the natural extremity. Special emphasis was laid on purely geometric criteria, namely the volume of working space and coefficients characterizing the properties of reach and the manipulative ability of the hand (or the grip of the robot) in all possible arm positions. A plane, three-factor model with three rotational pairs was used to describe arm movement in the vertical plane and the body's parallel plane symmetry (the sagittal plane), assuming an unrestricted angle of rotation at the shoulder joint and limits on the angle and movement of the elbow joint as a function of individual differences, in particular those resulting from training. The results of a numeric analysis of a two-criteria optimization problem are shown. Results from optimal synthesis of a kinematic chain using the three-factor model agree well with the actual proportions seen in the human arm, and indicate the importance of this approach both for the synthesis of technical manipulators and study of the principles involved in the function of living manipulative systems. It was also found, surprisingly, that a design based on two functional parameters (the geometric properties of the mobility of the hand and shoulder) can result in optimality as good as the three-factor design. The general conclusions drawn are that an aggregate of criteria exists that describes the different functions of the body, both in the general and the specific, that qualitative assessments of these criteria can be made from the mechanical parameters of the body, and that the mean values for the parameters (typical dimensions, weight, and moments of inertia in the parts of the body participating in an act of movement) are optimal. Figures 3; references 10: 7 Russian, 1 Yugoslav, 2 Western.

[9642-1549]

UDC 577.352.4

NATURE OF DEPENDENCE OF BLOCKING ION CHANNELS ON MEMBRANE POTENTIAL

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 275, No 5, Apr 84
(manuscript received 14 Sep 83) pp 1204-1207

GADZHI-ZADE, Kh. A. and ZIL'BERSHTEYN, A. Ya., Institute of Biological Physics,
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[Abstract] Ion blocking of channel conductivity depends on trans-membrane potential (TMP), with blocking increasing when the ion-block shifts in the external electrical field. Since models of this phenomenon have varied, the present article offers a different explanation, suggesting that the appearance of blocks in the channel causes redistribution of TMP in which much of the latter falls on the blocking molecules. This hypothesis was tested by blocking amphotericine channels with, first, tetraethylammonium (TEA) in the cis-side, followed by ribose in the trans-side. Results confirmed that the degree of blocking of TMP was significantly weakened by introducing a neutral blocking substance. Further, the hypothesis could be extended to suggest that inorganic blocks such as bivalent cations and penetrating ions can cause redistribution of TMP so that a significant portion falls on the ions. The location for bonding ions is at the entrance into the channel, not in its depth. Figures 3; references 7: 3 Russian, 4 Western.
[708-12131]

UDC 577.354.2:577.152.254

ADENYLATE AND GDP KINASES OF FROG RETINA OUTER ROD SEGMENTS: PUTATIVE
FUNCTIONAL ROLE OF TRANSDUCIN T_{β} SUBUNIT

Moscow MOLEKULYARNAYA BIOLOGIYA in Russian Vol 18, No 3, May-Jun 84
(manuscript received 10 Apr 83) pp 776-785

TISHCHENKOV, V. G. and ORLOV, N. Ya., Fourth Main Administration, USSR Ministry
of Health, Moscow; Institute of Biological Physics, USSR Academy of Sciences,
Pushchino, Moscow Oblast

[Abstract] Previous studies [Tishchenkov, VG, et al., Procs. Ist All-Union
Biophys. Conf., (4), p. 132, 1982] on the function of the T_{β} subunit of
transducin were extended by an analysis of the factors involved in the formation

of ATP from ADP in the presence of Mg^{++} , using *Rana temporaria* retinal outer rod segments. The specific activity of adenylate kinase (AK) was calculated as 2-4 μ moles ATP/mg protein/h, and was shown largely by undisrupted outer rod segments. AK activity was exhibited only by the soluble fraction of the outer rod segments, and constitutes a part of the GTP-binding complex (transducin). AK was further defined as the $T\beta$ subunit of transducin, and its activity was regulated by other transducin components. The GDP kinase activity of the transducin complex was shown to be a function of $T\beta$ and $T\alpha$ subunit interaction. The $T\beta$ subunit appears to function as a phosphotransferase which phosphorylates GDP bound to the $T\alpha$ subunit, and leads to the formation of the $T\alpha$ -GTP complex. The latter complex, then, functions to activate phosphodiesterase in the retinal outer rod segments of vertebrates. Figures 7; references 37: 6 Russian, 31 Western.
[1536-12172]

BIOTECHNOLOGY

UDC 61:57.08

MEDICAL ASPECTS OF PROBLEMS OF PHYSICO-CHEMICAL BIOLOGY AND BIOTECHNOLOGY

Kiev VRACHEBNOYE DELO in Russian No 6, Jun 84 (manuscript received 2 Dec 83)
pp 81-82

[Article by R. F. Dzyublik, A. G. Sadovskaya, L. N. Nenova, and L. M. Popova;
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Ministry of Health]

[Text] Decree No 622 "On further development of physico-chemical biology and biotechnology and utilization of their achievements in medicine, agriculture, and industry", issued by the CPSU Central Committee and the USSR Council of Ministers on 24 June 1981, promoted the expansion and intensification of research in this direction. There was significant expansion of research in the most important directions of physico-chemical biology in medicine and in the development of the theoretical and practical foundations of biotechnology. Complex research in this field is being conducted at 25 scientific research institutes and 11 medical institutes under the UkSSR Ministry of Health. Work is being done on developments that involve over 100 scientific topics. Institutions of the UkSSR Academy of Sciences are making an important contribution to the development of physico-chemical biology and biotechnology.

Joint research has made it possible to obtain some valuable results that are of great importance in the theory and practice of medicine. A preparation made of microorganisms has been obtained that is effective in the treatment of purulent inflammatory processes of the skin that are of staphylococcal origin. A method has been developed for cryogenic storage of elements of hemopoiesis for clinical use, and criteria have been determined for evaluating the functional condition of tissues and organs after they have undergone cryogenic storage.

Research at the molecular level involving the study of various pathological conditions of cells has undergone development. Mechanisms of ionic permeability of neuron membranes have been identified, and the nature of the specific activity of ganglion blockers has been studied. Research has been done on the biological role of inter-membrane interaction of mitochondria and microsomes in carrying out the body's antitoxic function, and methods for stimulation of this process are being worked out. The study of the interaction of biological membranes is a new direction in physico-chemical biology. The results that have been obtained indicate the important role of these interactions as a fundamentally new mechanism of integrating cellular metabolism and carrying out the antitoxic function. The research makes it possible to outline ways to control this function, which is important in

developing new methods for treating intoxication. The physico-chemical foundations of nervous conductivity and higher nervous activity are being worked out. The specific functional aspects of communication between various parts of the brain have been determined using a method for recording neuronal activity when separate cortical areas are stimulated.

Research is being done to study the mechanisms of the antiviral molecular regulators of nucleic acid metabolism with the aim of creating highly effective therapeutic and preventive preparations. Genes controlling the synthesis of immunoglobulins, insulin, and interferon have been obtained using an enzymatic method.

In the field of cellular engineering research has been started which will make it possible to obtain specific monoclonal antibodies. There is no doubt about the future applications of this research. Monoclonal antibodies can be used to study the structure of proteins, hormones, and medicines, and for purifying them and testing their histocompatibility.

In the area of hematology achievements in cellular engineering are being used to obtain monoclonal antibodies for cell-surface antigens of normal and malignant cells: group-specific erythrocyte antigens, antigens of the hepatitis-B virus, and leukemia-associated antigens. Monoclonal antibodies can be used to help identify various populations of hemopoietic cells, which in turn helps in revealing mechanisms that participate in the disruption of hemopoiesis.

Research is also being done on obtaining monoclonal antibodies based on hybrids of hemagglutinin and the flu virus. This will make it possible to study the antigenic properties of isolated strains, which will be used in epidemiological work to predict the outbreak of flu epidemics and to obtain vaccines.

It should also be pointed out that not enough research is being done in certain areas of physico-chemical biology and biotechnology. Not enough attention is being devoted to research on the structure and function of the most important biopolymers, proteins, nucleic acids, the molecular foundations of genetic mechanisms that determine heredity, and on developing the physico-chemical bases of hormonal regulation, immunology, cardiology, and oncology. The work being done on improving methods of prevention, diagnosis, and treatment of the most prevalent diseases is in need of considerable expansion, as is work on the development of biotechnological processes in medical production that is aimed at obtaining new medicines and preparations.

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CSO: 1840/1084

IMMOBILIZATION OF ACTINOMYCES OLIVOCINEREUS 154 GLUCOSE ISOMERASE ON MACROPOROUS SILICA CARRIERS

Moscow PRIKLADNAYA BIOKIMIYA I MIKROBIOLOGIYA in Russian Vol 20, No 2, Mar-Apr 84 (manuscript received 28 Oct 84) pp 223-229

VOROSHILOVA, O. I., KISELEV, A. V., NIKITIN, Yu. S., KHOKHLOVA, T. D., ANANICHEV, A. V., YEGOROV, A. M. and ULEZLO, I. V., Moscow State University; Institute of Biochemistry imeni A. N. Bakh, USSR Academy of Sciences, Moscow

[Abstract] Immobilization of partially-purified glucose isomerase derived from *Actinomyces olivocinereus* 154 to silica carriers of Soviet manufacture was studied to determine the conditions for maximum covalent coupling compatible with acceptable activity. Coupling of the enzyme to the carriers was affected via glutaraldehyde to γ -aminopropyltriethoxysilane-treated silicagels and silochromes in phosphate buffer, pH 7.5. Maximum enzymatic activity was exhibited by immobilization on macroporous (50-80 nm pores) silicagels and silochromes to give 60 mg enzyme per gram of carrier. Differences between the native and immobilized enzymes included different pH optima (pH 8.5 for native and 7.5 for immobilized preparation), and greater thermal stability of the immobilized enzyme (75% retention of activity after 140 h at 70°C, versus 30% for the native enzyme). In addition, the immobilized enzyme showed functional stability over a greater pH range (6-9.5). Figures 7; references 17: 10 Russian, 7 Western.
[1516-12172]

UDC 66.015.23:577.150.21

MATHEMATICAL MODELING OF IMMOBILIZED-ENZYME EXTRACORPOREAL SHUNTS

Moscow PRIKLADNAYA BIOKIMIYA I MIKROBIOLOGIYA in Russian Vol 20, No 2, Mar-Apr 84 (manuscript received 15 Jan 83) pp 230-235

BULYGIN, A. N., KLESOV, A. A., ROSHCHIN, S. A., BULYGINA, L. A., PASECHNIK, V. A., KHALYAPIN, B. D. and SHTUKINA, T. V., All-Union Scientific Research Institute of Highly Purified Biopreparations, Leningrad; Institute of Biochemistry imeni A. N. Bakh, USSR Academy of Sciences, Moscow

[Abstract] Mathematical modeling is provided for an immobilized-enzyme system, with the latter occupying the internal surface of extracorporeal shunts. Such devices may find utility in blood purification and in the processing of various other biological fluids. The mathematical treatment generalized the theoretical approach of Kobayashi and Laidler [Biotech. Bioeng., 16:99-118, 1947; Laidler KJ & Bunting, PS, Methods in Enzymol., 64(B):227-248, 1980], and made possible assessment of the rate of substrate conversion in relation

to internal tube diameter, fluid mechanics, substrate diffusion, viscosity, etc. This approach was used in analyzing a system of L-asparaginase immobilized to the internal surface of plastic shunt tubes, using the IF-REACTOR program designed for the Wang-2200VP computer. Figures 3; references 13: 7 Russian 6 Western.
[1516-12172]

UDC 577.152.311*4'17:661.183.8

SYNTHESIS OF IMMOBILIZED PHOSPHOLIPASE A₂ USING ORGANOSILICA ADSORBENTS

Moscow BIOORGANICHESKAYA KHIMIYA in Russian Vol 10, No 6, Jun 84
(manuscript received 18 Nov 83) pp 844-847

YEVSTRATOVA, N. G., OSTAPENKO, O. V., SEREBRENNIKOVA, G. A. and YEVSTIGNEYEVA, R. P., Moscow Institute of Fine Chemical Technology imeni M. V. Lomonosov

[Abstract] A discussion is presented on the need for preparation of immobilized enzymes, pointing out the advantages of extended storage of the enzymes, controlled use in synthesis, repeated use, simplicity of separation of enzyme and products of their use. The need to find appropriate carriers for the enzymes suggested the present work which describes use of organosilica adsorbents. These adsorbents are silochromes whose advantages have already been described. Phospholipase A₂ was deposited on the carrier, making use of the adsorbent's carboxyl or aminogroups. Conditions of adsorption (to produce the immobilized enzyme KF 3.1.1.4) are presented. The adsorbed enzyme is used to separate mixtures of racemic phospholipids. It has been found to be highly active, with capacity for repeated use. In these respects it is more effective than enzymes adsorbed on previously employed carriers, e.g., sepharose or arylaminoglass. References 11: 8 Russian, 3 Western.
[1538-8586]

PROTEIN PRODUCTION BY HYDROGEN-OXIDIZING BACTERIA

Moscow EKONOMICHESKAYA GAZETA in Russian No 27, Jul 84 p 16

TRESKOV, I., academician, director of the Institute of Biophysics, USSR Academy of Sciences, Siberian Department; SID'KO, F., head of laboratories, doctor of physico-mathematical sciences; VOLOVA, Yu., candidate of biological sciences and OKLADNIKOV, Yu., candidate of medical sciences, Krasnoyarsk

[Abstract] Study of hydrogen-oxidizing bacteria which synthesize high-protein biomass by using carbon dioxide and mineral salts is underway in Krasnoyarsk with the research support of the Institute of Biophysics, Siberian Department, USSR Academy of Sciences. Biomass produced by the bacteria is used in piglet and chicken feed instead of half of the usual amount of fodder of animal origin. Inclusion of up to 15-20 percent of this biomass in laying-hen and calf-feed

does not affect the quality of products obtained. The biomass is used to feed fur-bearing animals and rabbits. The economic impact of use of the biomass is significant. Cost of the biomass depends, to a large extent, upon the cost of hydrogen and the volume of its production. Cost of 1 ton of biomass ranges from 400-1000 rubles depending on the method of hydrogen production. Use of the biomass in food for some farm animals and fur-bearing beasts is profitable at a cost of 1000-1500 rubles per ton.
[762-2791]

ENVIRONMENT

WIND EROSION IN TURKMEN SSR

Ashkabad TURKMENSKAYA ISKRA in Russian 10 Jul 84 p 4

BAYRAMOV, S., candidate of geographical sciences, head of nature protection laboratories, Desert Institute, TuSSR Academy of Sciences

[Abstract] Severe erosion problems existing in the TuSSR are being aggravated by anthropogenic factors, especially by transportation of petroleum extraction equipment, oil and mineral extraction and hydroengineering installations. Serious damage to ecological systems exists between the settlement of Darvaza and Lake Sarykamysh, in Western Turkmenistan and in Eastern Kara-Kum. Environmental protection measures in these areas are being carried out mainly by the TuSSR Academy of Sciences, the administration of the Republican Society of Nature Protection, the Agricultural Institute imeni Kalinin and the TuSSR Ministry of Forestry. Progress by these and other special subdivisions at major enterprises is impeded by a shortage of specialists and inadequate training of participating personnel with only the Agricultural Institute offering an effective program. Carefully monitored and unified programs with research stations located in ecologically fragile regions are required to prevent further erosion and repair existing damage.
[765-2791]

UDC 615.919:579.887.9].07

TOXICITY MODELS FOR LEGIONELLA PNEUMOPHILA

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 5, May 84 (manuscript received 19 Apr 83) pp 52-55

TARTAKOVSKIY, I. S., BARKHATOVA, O. I. and PROZOROVSKIY, S. V., Institute of Epidemiology and Microbiology imeni N. F. Gamaleya, USSR Academy of Medical Sciences, Moscow

[Abstract] Guinea pig peritoneal macrophage monolayer cultures and AKR mice were used as experimental models for testing pathogenicity of Legionella pneumophila strains in terms of, respectively, cell viability and animal mortality. Culture suspension of virulent L. pneumophila caused the death of 50% of the macrophages in 6 h, while cell lysate obtained by ultrasonication killed 25-30% of the cells in tissue culture within 2-4 h. Avirulent cultures or culture medium filtrates of the virulent cultures had no effect on the macrophages as determined by the trypan blue test. Both the virulent cultures and their sonic lysates caused death of the AKR mice in 18-24 h; the avirulent culture was without effect. These model systems were determined to be suitable for the rapid differentiation between virulent and avirulent L. pneumophila strains, while the rapid killing of the macrophages indicates the existence of a potent intracellular toxin. Figures 2; references 9 (Western). [1529-12172]

UDC 616.36-002-022-036.2:313.13

CHARACTERISTICS OF EPIDEMIC PROCESS IN VIRAL HEPATITIDES A AND B ON TERRITORIES WITH DIFFERENT MORBIDITY LEVELS. PART 1. HEPATITIS A

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 5, May 84 (manuscript received 10 Oct 83) pp 70-74

KOMPANIYETS, A. A., DOROSHENKO, N. V., STAKHANOVA, V. M., DARDIK, F. G., REYNARU, I. K., VOROBAY, V. S., PIROZHKOVA, Z. P., URBACH, V. Yu. and YYGISTE, A. K., Institute of Virology imeni D. I. Ivanovskiy, USSR Academy of Medical Sciences, Moscow; Kazakh Institute of Epidemiology, Microbiology and Infectious Diseases, Alma-Ata; Tallin Institute of Epidemiology, Microbiology and Infectious Diseases

[Abstract] Serologic studies for the determination of the incidence of antibodies against hepatitis A (HA) were conducted in Tallinn (Estonia) and Alma-Ata

(Kazakhstan), two cities differing in morbidity patterns and severity of clinical manifestations of HA. Basically, the morbidity in Alma-Ata is four times greater than in Tallin, while the incidence of icteric to non-icteric clinical cases is 5.7-times greater in the former than in the latter city. Other differences revealed in the 15 year study covering the 1968-1982 period showed that in a given age group the incidence of morbidity decreased once 50% of that population became immune, a figure attained in the 4 year age group in Alma-Ata and in the 20 year olds in Tallinn. Eventually, all age groups showed 90-100% immune individuals, with high and moderate titers occurring predominantly in the pediatric population. Lowest antibody titers were generally present in the over-40 group. Figures 3; references 6: 4 Russian, 2 Western.
[1529-12172]

UDC 616.98:579.841.95]-022.912.2

ANTIBODY DYNAMICS IN CARNIVOROUS MAMMALS AND CORVINE BIRDS INFECTED WITH FRANCISELLA TULARENSIS

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 5, May 84 (manuscript received 27 May 83) pp 105-108

SUKHANOV, N. A., Irkutsk Scientific Research Anti-Plague Institute of Siberia and the Far East

[Abstract] Dynamics of the antibody response were followed by agglutination and passive hemagglutination tests (AT, PHT) in weasels (*Mustela erminea*, *M. nivalis*), crows (*Corvus corone*) and magpies (*Pica pica*) following subcutaneous infection with *Francisella tularensis*, or feeding on dying mice infected with the same agent. Both the mammals and the birds were serologically negative prior to exposure to *F. tularensis*, and are species known to be relatively susceptible to infection with *F. tularensis*. Antibodies were first detected within 7-15 days after subcutaneous infection, with the PHT titers greatly exceeding the AT titers. Maximum PHT titers were detected on 15-21 days after infection, reaching 1:140 in the weasels and 1:260 in the birds. Thereafter the antibody titers fell and all animals were negative by day 60. Feeding on infected mice resulted in much higher antibody titers with both methods of detection, with the PHT titers again exceeding the AT titers. Antibodies were first detected on day 7, with maximum titers detected on day 15 (PHT titers 1:680 in mammals, 1:210 in birds). All species were seropositive on day 60. In terms of leukocytolysis, all the weasels had developed an allergic response to the tularemia antigens by day 15. These observations indicate that the corvine birds and carnivorous mammals may be used in serologic studies on the prevalence of tularemia. Figures 2; references 7: 5 Russian, 2 Western.
[1529-12172]

RECOVERY OF FLEA POPULATION DENSITY OF DAUR GOPHERS AFTER BURROW DISINFECTION
IN TRANSBAYKAL PLAGUE FOCUS

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 5,
May 84 pp 114-115

KARDASH, A. I., ZARUBINA, V. N. and ROGOV, A. G., Chita; Irkutsk

[Abstract] Studies were conducted on the rate of recovery of the flea population of the Daur gophers (susliks) following burrow disinfection with 10% DDT conducted between 1966 and 1975 in the Transbaykal endemic plague area. Evaluation of the total population density of the fleas and the species composition showed that effective reduction in the population prevailed for some three years, with an effectiveness of disinfection of 89.9% (vs. 99.8% during the initial 1.5 months). Full recovery of the flea population occurred after 4 years in the Southeastern Transbaykal.
[1529-12172]

PUTATIVE ROLE OF BIRDS IN DISSEMINATION OF ZONOTIC INFECTIONS IN SOUTHEASTERN
TRANSBAYKAL

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian
No 5, May 84 p 115

KHAMAGANOV, S. A., DUBOVOY, A. A., ZHIVOLYAPINA, R. R., PESHKOV, B. I. and
BELYAYEV, K. G., Chita; Irkutsk

[Abstract] Epidemiologic studies were conducted on the birds in Southeastern Transbaykal to correlate their infestation with different flea species with isolation of pathogenic agents, in order to assess the putative contribution of birds to the dissemination of zoonotic infections in that region. The studies conducted between 1973 and 1980 encompassed 1942 birds representing 100 different species. Correlation of the serologic and microbiologic findings, as well as data on flea infestation, provided indications that the field sparrow, gulls, green plover, hawk, and wheateater may be involved in the circulation of tularemia, salmonellosis and Erysipelothrix infection. In addition, various larks, the hedge sparrow, and the aberdevine have been implicated as carriers of groups A and B arboviruses.
[1529-12172]

PAPER METHOD OF BLOOD SAMPLING FOR SEROLOGIC TESTING IN EPIDZOOTOLOGIC STUDIES
IN PLAGUE FOCI

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 5,
May 84 pp 115-116

TYULEMBAYEV, M. A., YAKUNIN, B. M., KENDIRBAYEV, Zh. A. and MAMATKANOV, O. M.,
Alma-Ata; Frunze

[Abstract] A paper method has been devised for easy sampling of blood from autopsy material intended for use in epizootologic studies on plague in endemic

areas. Squares of paper (2 x 2 cm) were pretreated with sodium merthiolate (1:1000) and stored in dried state, until use, in a wide-necked flask. On autopsy of animals, the papers were wetted with the cardiac and aortic contents of the animal, and transferred to a test tube containing 2 ml of physiologic saline (giving a 1:10 dilution). After 2-3 h of storage at room temperature, standard serologies were performed. Tests conducted with the 'paper' specimens and washings obtained from the thoracic cavity revealed identical results in terms of antibody titers, with a higher percentage of seropositive results yielded by the 'paper' method. These observations indicate that the use of the 'paper' method can be recommended for epidemiologic studies on plague in examining fallen rodents.
[1529-12172]

UDC 616.98:579.881.13]-07(477.74)

Q-FEVER IN ODESSA OBLAST

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 5, May 84 (manuscript received 26 Apr 83) pp 117-119

ZUBKO, V. I., REVENOK, N. D., ZEVAKOV, V. F. and TOLPINA, Z. A., Odessa Oblast Sanitary-Epidemiologic Station; Odessa Municipal Infectious Diseases Hospital

[Abstract] In recent years studies on the prevalence of Q-fever in the Odessa Oblast have been neglected, and many clinical and veterinary cases have been misdiagnosed. However, in 1982 extensive epidemiologic studies were commenced, which demonstrated that approximately 26:00% of the cattle had serologic evidence of having sustained [fever. Examination of cattle breeders and other animal handlers revealed a seropositive rate of 22:00%, and serologic studies on some 503 patients with fever revealed 1:00% contained antibodies against *R. burnetii*. One case study of a 22 year old student of veterinary medicine is presented, who apparently contacted the disease in the course of his studies. Subsequent examination of other students revealed a total of 17 seropositive cases. Such findings underscore the care that must be exercised in the Odessa Oblast in maintaining a high index of suspicion to assure timely diagnosis and management of Q-fever. References 2 (Russian).
[1529-12172]

IMMUNIZATION OF BLOOD DONORS WITH INACTIVATED, CONCENTRATED AND PURIFIED VACCINE AGAINST TICK-BORNE ENCEPHALITIS FOR PRODUCTION OF IMMUNE BLOOD PREPARATIONS

Moscow VOPROSY VIRUSOLOGII in Russian Vol 29, No 1, Jan-Feb 84
(manuscript received 14 Mar 83) pp 56-59

EL'BERT, L. B., PERIKOV, Yu. V., GRACHEV, V. P., RUSANOV, V. M., KROKHINA, M. A., ROYS, M. S., KRUTYANSKAYA, G. L., NESAULE, V. M., KHATOV, P. P., RUBIN, S. G., SEMASHKO, I. V., LUZIN, P. M., LYSKOVTSSEV, M. M., KIPRIYANOVA, N. V., RUSINSKAYA, T. K., VERETA, L. A., PESKOV, A. S., DOMANSKIY, K. A., YAKOVLEV, Yu. I. and DEKONENKO, Ye. P., Institute of Polymyelitis and Virus Encephalites, USSR Academy of Medical Sciences; Central Scientific Research Institute of Hematology and Blood Transfusion, Moscow, Khabarovsk Scientific Research Institute of Epidemiology and Microbiology

[Abstract] Intramuscular vaccination of 844 persons ranging in age from 20 to 50 years was performed to determine optimal conditions of immunization of blood donors by inactivated concentrated vaccine against tick-borne encephalitis in order to produce immunoglobulin and plasma from their blood. Plasma and serum obtained at Moscow municipal and Latvian republic blood transfusion stations were used to produce 2 series of specific immunoglobulin against tick-borne encephalitis with antihemagglutinin concentrations of 1:1280 and 1:320 antibody titers respectively. Titration of one of the series in neutralization reactions and diffusion-precipitation-on-agar reaction with several tick-borne encephalitis virus strains from different area of the USSR showed high anti-virus activity in regard to both homologous and heterologous variants. The immune plasma produced significant therapeutic effect in treatment of patients with meningeal, meningoencephalytic and encephalytic forms of the disease. Optimum schedules for immunizing blood donors were presented. References 6 (Russian).
[1530-2791]

UDC 616.98:578.833.1]-036.21(575.3)

OUTBREAK OF ARBOVIRUS INFECTION IN TAJIK SSR CAUSED BY ISSYK-KUL VIRUS (ISSYK-KUL FEVER)

Moscow VOPROSY VIRUSOLOGII in Russian Vol 29, No 1, Jan-Feb 84
(manuscript received 31 Mar 83) pp 89-92

L'VOV, D. K., KOSTYUKOV, M. A., DANIYAROV, O. A., TUKHTAYEV, T. M., SHERIKOV, B. K., BUN'YETBEKOV, A. A., BULYCHEV, V. P. and GORDEYEVA, Z. Ye., Institute of Virology imeni D. I. Ivanovskiy, USSR Academy of Medical Sciences, Moscow; Tajik Scientific Research Institute of Epidemiology and Hygiene, TaSSR Ministry of Health, Dushanbe

[Abstract] Outbreak of a disease caused by Issyk-Kul virus, rising in southern Tajikistan in 1982, was described. The virus was isolated from 21 persons and

diagnosis was confirmed virologically and serologically in 17 cases. After sudden onset (body temperature 39-41°C), the disease lasted nearly 8 days with complete recovery requiring 1-1-1/2 months in all cases. The disease syndrome was described, the distribution of cases by month from March to August was presented, pathways of infection were discussed and the role of causative agents was described. No fatalities occurred as a result of the disease. A map of the area of concern is presented. Figure 1; references 22: 19 Russian, 3 Western.
[1530-2791]

UDC 578.835.11:578.74

DETECTION OF ANTIBODIES TO ENTEROVIRUS 71 IN SERA OF MOSCOW RESIDENTS

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 3, Mar 84 (manuscript received 8 Jun 83) pp 94-95

KRAVCHENKO, A. T. and OMEL'CHENKO, T. N., State Scientific Research Institute of Standardization of Medical Biological Preparations imeni L. A. Tarasevich, Moscow

[Abstract] Enterovirus 71 "Bulgarian strain 258/75", produced at the Institute of Applied Virology, East Germany Ministry of Health, was used in a study of serums from Moscow residents to detect the presence of virus-neutralizing antibodies to enterovirus 71 in blood serum of persons without any typical signs of enterovirus 71. Study of 55 serums for presence of virus-neutralizing antibodies to EV 71 produced the following results: number of serums with antibodies titer less than 1:2 was 14; number with titer of 1:2 was 8; number with titer 1:4 was 10; number with titer 1:8 was 8 and number with titer $\geq$ 1:16 was 15. Data obtained showed that 23 (41.7 percent) of the 35 serums studied were seropositive (titer 1:8 and higher) and 15 of the positive serums had a titer $\geq$ 1:16 (more than 50 percent). It was assumed that low antibody titers (1:2-1:4) do not exclude the possibility of their heterotypical origin and the presence of such a level of specific antibodies as 1:8- $\geq$ 1:16 indicates that either this virus strain or some other strain containing some of the same antigens as EV 71 circulates among the Moscow population. References 10: 5 Russian, 5 Western.
[1526-2791]

UDC 616.98:578.833.29.

RIFT VALLEY FEVER

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 3, Mar 84 (manuscript received 31 May 83) pp 3-9

DROZDOV, S. G., Institute of Poliomyelitis and Virus Encephalites, USSR Academy of Medical Sciences, Moscow

[Abstract] Discussion of etiology, epidemiology, pathological anatomy, pathogenesis, clinical picture, laboratory diagnosis, prophylaxis and treatment of Rift Valley fever is based on a survey of non-Soviet literature. References 43 (Western).
[1526-2791]

NATURAL FOCUS OF LEPTOSPIROSIS IN KRASNODAR KRAY RICE FIELDS AND MEANS OF ITS SANITATION

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 3, Mar 84 (manuscript received 13 Apr 83) pp 58-62

KARASEVA, Ye. V., CHERNUKHA, Yu. G. and STRIKHANOVA, Ye. V., Institute of Epidemiology and Microbiology imeni N. F. Gamaleya, USSR Academy of Medical Sciences; Kray Sanitary Epidemiology Station, Krasnodar

[Abstract] Year-round studies (from 1978-1981) examined the presence of rat populations on Krasnodar Kray rice fields and in buildings, population densities, the presence of leptospirosis epizootics and the danger of human infection from any such opizootics. The investigation included study of 2302 animals (1464 grey rats, 372 house mice, 324 wood mice, 22 field mice, 83 muskrats and 27 other species). Presence of leptospirosis was determined by bacterioscopic, bacteriological and serological methods. Leptospirosis epizootics were found among grey rats, house mice, wood mice and field mice but apizootics develop independently if one another in populations of different species in spite of a common habitat because the epizootics were caused by different Leptospirae. This was confirmed by isolation of cultures and serological studies. Epizootics developed in the rice fields year round, being most intense at the end of summer, decreasing somewhat in autumn and increasing again in early spring. Epizootics were more intense in rice fields than in building and rodent distribution varied according to the season. Danger of human infection was greatest in areas commonly visited by humans. Different control methods were used in the field and in settlements. The best trapping time was winter and early spring when rodents were concentrated in certain areas. Zinc phosphide, rotendane, fluoracetamide and brodifakum were used to combat the rodents. Alternation of poisons was most effective and briquettes were the most efficient form. Other control measures included removal of debris from the fields, vaccination programs, systematic sanitation propaganda and field deratization. References 24: 13 Russian, 1 Western. [1526-2791]

DATA OF SEROLOGICAL SURVEY OF REPUBLIC OF CONGO POPULATION TO DETECT ANTIBODIES TO ORTHOPOXVIRUSES. REPORT 1. COMPARISON OF METHODS OF STUDY AND OVERALL RESULTS

Moscow ZHURNAL MIKROBOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 3, Mar 84 (manuscript received 30 Jun 83) pp 95-100

MARENNIKOVA, S. S., SHELUKHINA, E. M., MAL'YSEVA, N. N., YEFREMOVA, Ye. V., MATSEVICH, G. R., NIKULINA, V. G., Khabakhpasheva, N. A., STEPANOVA, L. G., ARITA, I. and GROMYKO, A. I., Moscow Scientific Research Institute of Virus Preparations, USSR Ministry of Health

[Abstract] Serums collected in three regions of the Republic of the Congo (Pul, Sanga and Plato) from all age-groups over the age of 3 years were studied

by use of the hemagglutination inhibition reaction (HIR), neutralization reaction (NR) and the ELISA method. Study of 2114 serums revealed the presence of anti-smallpox antibodies in 19.5 percent, 29.0 percent and 32.8 percent of them, according to the test used. The immune population figure was lowest (17.3 percent) in the undeveloped tropical rain forest of the Congo and was higher by a magnitude of 2 or more in the more economically developed regions. Analysis of 3 groups (persons obviously vaccinated, persons for whom vaccination or recovery was doubtful and obviously unvaccinated nore recovered persons) revealed antibodies in 64.2-79.2 percent of persons at different periods of time after vaccination, the same percentage for the group of persons with doubtful vaccination and 14.2 percent (HIR test) and 30.0 percent (ELISA test) for unvaccinated persons. The percentage of persons having antibodies to orthopoxviruses increased steadily with age. Some possible explanations of this were discussed. The HIR test was less sensitive than the RN and ELISA tests but it is simple and convenient to use in preliminary serological study. Many persons were found to have anti-smallpox antibodies in spite of reports of smallpox in the Congo since 1966 and the termination of regular vaccination in 1977. References 8: 2 Russian, 6 Western.
[1526-2791]

GENETIC ENGINEERING AND VACCINES PRODUCED FROM VIRUS PROTEINS

Kiev MOLEKULYARNAYA BIOLOGIYA in Russian No 32, 1982 (manuscript received 10 Feb 81) pp 3-7

DYACHENKO, N. S., Institute of Microbiology and Virology imeni D. K. Zabolotniy, UkSSR Academy of Sciences

[Abstract] Some major problems involved in producing vaccines from virus proteins are discussed in terms of the role of genetic engineering in this process. Specialists in genetic engineering working on this problem are concentrating on the study of antigenic specificity of individual structural proteins of a virus, the process of its immunoactivation, participation in it of antibodies to individual proteins in order to produce a protective antigen and the search for means of increasing immunogenicity of virus proteins in a soluble state. Development of hybrid plasmids from genetic material of several viruses for subsequent microbiological synthesis of polyvalent antigen should help in production of vaccines from virus proteins. Adenoviruses are used as an example in analyzing problems related to successful development of microbiological synthesis of virus proteins and their use as vaccines. References 29: 8 Russian, 2 Western.
[756-2791]

IMMUNOLOGY

DETOXIFICATION AND IMMUNITY CORRECTION METHODS DESCRIBED

Tashkent PRAVDA VOSTOKA in Russian 14 Jun 84 p 3

VAKHIDOV, V., member of the UZbek Academy of Sciences

[Abstract] On the occasion of the Second All-Union Conference on Sorption Methods of Detoxification and Immunity Correction, the author comments on the principles and uses of these methods and mentions recent advances that have been made in this field. The conference was held at the Tashkent affiliate of the All-Union Surgery Research Center (VNTSKH) of the USSR Academy of Medical Sciences (AMN SSSR).

The author relates that work in this field is being pursued in line with scientific and technical programs which a large number of research institutions are carrying out under the direction of the State Committee for Science and Technology. Soviet scientists under the direction of Yu. M. Lopukhin, member of AMN SSSR, are said to be leaders in the development, study and broad introduction of the new therapeutic methods known as hemosorption, lymphosorption and plasmosorption. Lopukhin and academician R. V. Petrov are credited with pioneer work in the field of immunity correction--the restoration of functions of the immune system by means of various medicinal preparations and physical-chemical effects. Immunity stimulants, including preparations called T-aktivin, levamezol and splenin, are being introduced into clinical practice for the purpose of reducing the number of surgical complications of certain types.

The author reports that sorption methods are being studied and employed in clinical practice at VNTSKH's Tashkent affiliate, where a republic center for extracorporeal detoxification has been created. This center is rendering scientific, consultative and practical assistance to medical institutions which are working with this type of detoxification.

SNAP/FTD
CSO: 1840/752

SOLID-PHASE ELISA FOR TULAREMIA ANTIGEN

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 5,
May 84 (manuscript received 30 Mar 83) pp 88-92

UMNOVA, N. S., SHAKHANINA, K. L., PAVLOVA, I. P. and MESHCHERYAKOVA, I. S.,
Institute of Epidemiology and Microbiology imeni N. F. Gamaleya, USSR Academy
of Medical Sciences, Moscow

[Abstract] Sandwich-type ELISA has been developed for soluble tularemia antigen extracted by the Boivin technique and analyzed to determine parameters for optimum sensitivity and specificity. Employing standard commercial reagents showed that a system could be designed to detect the antigen in the range of 10-50 ng/ml. The specificity of the assay was directly related to the degree of purification of the antibodies used for coupling to polystyrene and conjugation with peroxidase. In addition, removal of unconjugated peroxidase from the system extended the useful range of the assay to below 10 ng/ml. A further important note was that the Soviet preparation of peroxidase from Biokhimreaktiv could be used with equal success in the ELISA in place of the much more expensive Sigma (USA) enzyme. Figures 4; references 11: 2 Russian, 9 Western.
[1529-12172]

UDC 579.842.16.083.3

IMMUNOGENICITY OF INACTIVATED KLEBSIELLA OZAENAE CULTURES IN RELATION TO PROPERTIES, CULTIVATION AND STORAGE OF STARTING STRAINS

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 5,
May 84 (manuscript received 31 May 83) pp 99-102

MOLOCHKO, V. A., KRYLOV, I. A., KRASIL'NIKOV, A. P. and LASTOCHKINA, T. M.,
Minsk Medical Institute

[Abstract] Experiments on subcutaneously inoculated mice with encapsulated strains of Klebsiella ozaenae (02B:K4 antigen) demonstrated that such heat-inactivated vaccines possess strong and stable immunogenicity. The immunogenic properties were directly related to capsular antigen content and essentially unrelated to the initial virulence of the strain, age of culture, and even long term (2 years) storage. A lesser degree of immunity was imparted to the mice by 'unencapsulated' strains. K. ozaenae 2211 was selected as the most immunogenic strain for optimum immunization studies with heated vaccines. Optimum levels of long-lasting immunity were obtained by a single subcutaneous immunization with 250×10^6 heat-killed cells. Figures 1; references 11 (Russian).
[1529-12172]

RADIOIMMUNOASSAY DETERMINATION OF HBsAg IN HUMAN γ -GLOBULIN PREPARATIONS

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 5, May 84 (manuscript received 26 Apr 83) pp 103-105

VYAZOV, S. O., BOCHAROVA, N. G., SHALUNOVA, N. V., ANAN'YEV, V. A. and MINAKOVA, L. V., Institute of Virology imeni D. I. Ivanovskiy, USSR Academy of Medical Sciences; State Institute of Standardization and Control of Biological Preparations imeni L. A. Tarasevich, Moscow

[Abstract] An evaluation was made of the suitability of standard radio-immunoassay (RIA) techniques for the analysis of human γ -globulin preparations for the presence of HBsAg. The results showed that using RIA methodology for analysis of serum or plasma samples was unsuitable for the γ -globulin samples, because of false cut-off counts obtained with standard negative controls. Studies with 99 samples of human γ -globulin preparations yielded 67.7% positives for HBsAg using negative serum controls. However, the use of purified γ -globulin controls yielded 100% negative samples, which was confirmed by neutralization tests. Consequently, these observations indicate that analysis of human γ -globulin preparations for HBsAg by RIA requires the use of controls consisting of known negative γ -globulin pools and, furthermore, that all positive samples should be further tested by neutralization serology. Figures 1; references 10 (Western).
[1529-12172]

UDC 616.36-002.14-022:578.891

ENDOGENOUS INTERFERON IN TREATMENT OF HEPATITIS B

Moscow VOPROSY VIROSOLOGII in Russian Vol 29, No 1, Jan-Feb 84 (manuscript received 11 Mar 83) pp 109-111

FARBER, N. H., KETILADZE, Ye. S., YERSHOV, F. I., KAMILOV, F. Kh. and NOSIK, N. N., Institute of Virology imeni D. I. Ivanovskiy, USSR Academy of Medical Sciences, Moscow

[Abstract] Acute virus hepatitis patients ranging in age from 19 to 60 years were studied in order to establish correlations between the capacity of the patient's body to eliminate the virus and the endogenous leucocytic interferon (LI) titer in the blood. Low LI titers increased the length of hospitalization of the virus hepatitis patients. AlAT indicators increased more than AsAT indicators in patients with low LI level and produced a higher AsAT/AlAT coefficient (0.92 as opposed to 0.61). This and other clinical and biochemical indicators indicated greater liver damage in patients with low LI level. Reverse correlations between the LI level and stability of persistence of the virus in the body was established. The findings justify more extensive therapeutic use of exogenous LI in treatment of chronic and acute virus hepatitis. References 17: 5 Russian, 12 Western.
[1530-2791]

IMMUNOLOGICAL ACTIVITY AND TOXICITY OF ORAL VACCINE PRODUCED FROM SALMONELLA MINNESOTA MUTANT RE

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 3, Mar 84 (manuscript received 15 Apr 83) pp 78-82

APOLLONIN, A. V., ARTEMOVA, Ye. K., VLASOV, G. S., KUKLINA, S. I., SALOV, V. F. and LIKHODED, V. G., Central Scientific Research Institute of Vaccines and Serums imeni I. I. Mechnikov, Moscow

[Abstract] *Salmonella minnesota* NE 343 (SF 1111) with full value lipopolysaccharides, isolated from its mutant NE 328 (R595) with chemotype Re and toxigenic strain *Pseudomonas aeruginosa* NE 313 (PA 103) lacking some proteases were used in a study of the possibility of protecting mice from *P. aeruginosa* by oral immunization with vaccine from the RE mutant. *P. aeruginosa* NE 313 (5LD₅₀ dose) was injected into the caudal vein of white mongrel mice (10-12 g weight) 7 days after oral immunization with 10⁹ microbial bodies 3 days in a row. Vaccine from mutant RE produced a 54 percent survival rate of the mice which is much higher than the rate for unvaccinated mice. Vaccine from the strain with full-value lipopolysaccharides was ineffective. Oral administration of heated RE vaccine was distinguished by low chronic toxicity. The protective effect of the vaccine, the low chronic and acute toxicity from it and the pronounced immunomorphological reconstruction after use of the vaccine demonstrated the advisability of oral administration of the RE vaccine to produce active and passive immunity to conventionally pathogenetic gram-negative bacteria. References 10: 4 Russian, 6 Western.
[1526-2791]

MARINE MAMMALS

HYDRODYNAMIC RESISTANCE IN DOLPHINS

Moscow TEKHNIKA MOLODEZHI in Russian No 6, Jun 84 pp 49-50

ALEYEV, Yu., Sevastopol

[Abstract] The hydrodynamics of dolphins in swimming is discussed. The history of research on this subject is briefly reviewed and the theory of M. Kramer (1957) on the damping properties of the dolphin's skin in overcoming resistance during movement is described. It has now been established that during swimming the front part of the dolphin, as far back as the dorsal fin, is in fact streamlined by a laminar boundary flow, while behind the dorsal fin the boundary layer becomes turbulent. The theory of F. Essapyan holds that the dolphin reduces hydrodynamic resistance during swimming by shifting turbulence toward the tail through the use of mobile transverse skin folds that travel along the body from front to rear. An attempt to model mobile deformation of the skin folds in the dolphin is described. Since it was not possible to do direct experiments with the dolphins themselves, female human swimmers were used as the model. With the aid of high-speed underwater cameras it was established that in rapid swimming and when being towed at speeds of 2 to 4 meters per second in all cases and in all subjects relatively large wavelike folds were formed in the skin along the torso and thighs. The relief of the wavelike folds bore no relationship to the reliefs formed by muscle movement. The folds appeared in two cases: during sharp jerking movements and during prolonged, even swimming at speeds greater than 1.5 meters per second. Maximum skin folding was seen at highest speeds. The distribution of dynamic pressure on the body surface was studied using rigid models of human females and dolphins. It was found that the wave deformations on the skin formed as the result of large vortices on the body's surface, creating significant gradients in dynamic pressure. Deformation occurs passively as the result of external hydrodynamic forces. The basic finding was that, far from reducing hydrodynamic resistance, deformation increases it. The skin muscles located along the belly and lateral surface of the dolphin's body are used not to generate the wave deformation, as previously held, but exactly the opposite, namely to prevent them. Figures 4; no references. [9642-792]

LASER EFFECTS

ISCHEMIC HEART DISEASE TREATED WITH PULSED LASER

Vilnius SOVETSKAYA LITVA in Russian 24 Jun 84 p 4

[Unattributed article]

[Excerpt] Kaunas heart surgeons have added yet another momentous page to the medical biography of the laser. For the first time, the powerful beam has been utilized here to cure ischemic heart disease.

A patient was gravely ill. As a result of sclerosis, his heart vessels had narrowed sharply, the lumens had become plugged in places, and the supply of oxygen to the heart muscle was poor. With the aid of a pulsed laser, the heart surgeons 'drilled' several dozen small channels in the zone of the heart muscle, whose oxygen supply was particularly poor.

The lives of two patients already have been saved with the aid of the laser at the Kaunas Clinical Hospital. These unique operations were performed by Professor Yu. Bredikis, corresponding member of the USSR Academy of Medical Sciences and head of a chair of instruction of the Kaunas Medical Institute, Doctor of Medical Sciences A. Dumchyus and Candidate of Medical Sciences V. Obelenyus, in collaboration with specialists of the laser surgery laboratory of the Physics Institute imeni Lebedev USSR Academy of Sciences and the surgical clinic of the USSR Ministry of Health.

The patients are feeling well. The supply of oxygen to their heart muscles has been restored.

FTD/SNAP

CSO: 1840/754

BRIEFS

LASER INSTRUMENT PRODUCTION--Kazan. A set of instruments for laser surgery has been developed at Medinstrument, the Kazan Scientific Production Association. Laser surgery, bringing new possibilities to medicine, is experiencing an acute equipment shortage, and specialists of the autonomous republic have undertaken a solution to this problem. They were helped a great deal by physicians of the Central Scientific Research Laboratory, USSR Ministry of Health. Serial production of the new products will begin this year.

[Text] [Baku VYSHKA in Russian 8 Jul 84 p 1] 12262

USE OF LASERS IN TREATING ISCHEMIC HEART DISEASE

Moscow VECHERNAYA MOSKVA in Russian 26 Jun 84 p 2

SAMOYLOV, B.

[Abstract] Associates of the All-Union Center For the Use of Lasers in Surgery and the Department of Hospital Surgery of Kaunas Medical Institute have used lasers to create collateral pathways of cardiac circulation in operations on two persons after extensive experimentation on animals. The operations, under anesthesia without artificial blood circulation, employed a specialized pulse laser device which penetrates the heart muscle without harming other tissues. The procedure was used to produce 25 microchannels of less than 1/2 mm each in the myocardium of one patient and 60 such microchannels in the myocardium of the other by passage of laser emission through a "window" in the chest into the myocardium. Patients sat up on the day after surgery and stood up on the following day and heart pain disappeared in both cases. The procedure is derived from findings concerning reptilian blood circulation in which 85 percent of nourishment of the heart comes via channels connecting the heart cavity and the myocardium.
[761-2791]

LASER APPLICATION IN TURKMEN SSR

Ashkhabad TURKMENSKAYA ISKRA in Russian 31 Jul 84 p 3

BABAYEV, O., Turkmen State Medical Institute

[Abstract] Lasers are being used in three main medical applications in the Turkmen SSR, namely therapeutic, surgical and diagnostic. The lasers used in surgery are more powerful than those used for therapeutic or diagnostic purposes. The "Romashna," "Skal'pel-1" and other carbon-dioxide lasers are used as scalpels. Two of the earliest laser surgery units in the USSR were set up in the Turkmen SSR at the Scientific Research Institute of Eye Diseases and at the Turkmen State Medical Institute Surgical Clinic No 3 in Ashkhabad. New methods in laser surgery and laser therapy and new laser equipment have been developed at this institute over the past 4 years. Some 2,000 surgical procedures have now been done there with the "Skal'pel-1" unit, and more than 25 papers on laser surgery have been published and 1 certificate of invention and

22 efficiency proposals approved. Fifteen different methods have been developed for treating diseases with lasers, including the world's first method for treating leishmanial ulcers. Considerable experience has been gained in the treatment of proctologic diseases. Other laser applications have been made in gynecology, pediatric surgery and oncology. A special laser research unit has been set up in the Turkmen Medical Institute. Future plans for the use of lasers in medicine will require the resolution of major problems. It is essential first and foremost to set up a problems laboratory, possibly as a branch of the All-Union Center for Laser Surgery. The republic government is taking steps to provide laser equipment for medical facilities, but this will entail construction work also. Assembly and maintenance work on laser equipment is now being done by personnel from the Ulyanovsk plant where this equipment is being produced, but engineering and maintenance staff must also be trained locally. Further research is also needed on the use of laser equipment specifically in the Turkmen SSR, with consideration of the existing hot climatic conditions. No references.

[9642-790]

PURIFICATION AND PROPERTIES OF INTRACELLULAR NUCLEASE FROM COMPETENT BACILLUS SUBTILIS

Moscow PRIKLADNAYA BIOKIMIYA I MIKROBIOLOGIYA in Russian Vol 20, No 2,
Mar-Apr 84 (manuscript received 6 Jul 82) pp 200-207

BELOV, I. S. and BELOVA, M. M., Kazan State University

[Abstract] A novel nuclease has been isolated from the nucleo-protein-membrane complex (NMC) of competent *Bacillus subtilis* SB25 his_2trp_2 . The sequence of steps resulting in the isolation of the enzyme included cell lysis with lysozyme and osmotic shock, separation of NMC by centrifugation, treatment of NMC with pancreatic RNase and dialysis against Ca^{++} -containing tris-acetate buffer, and chromatography on CM- and phosphocellulose, yielding the enzyme as a 674-fold purified preparation. The nuclease was activated by Ca^{++} (0.5-1.0 mM), and hydrolyzed denatured DNA and RNA with an optimum pH in the 10.0-10.5 range. Mono- and dinucleotides with 5'-phosphate ends were the primary products of hydrolysis of denatured DNA. The enzyme was completely inactivated by the presence of 1.0 mM EDTA; the lack of an unambiguous correlation between protein and nuclease peaks on eluates from the phosphocellulose column indicated a lack of homogeneity. The nuclease was assigned to the deoxyribo-nucleinate-ribonucleinate-5'-nucleotido-hydrolazo-exonuclease group (EC 3.1.4.1) on a preliminary basis. Figures 6; references 13: 4 Russian, 9 Western.
[1516-12172]

REVIEW OF BOOK BY SMIRNOV, V. V., REZNIK, S. R. and VASILEVSKAYA, I. A.,
SPOROGENOUS AEROBIC BACTERIA--PRODUCERS OF BIOLOGICALLY ACTIVE SUBSTANCES
[Sporoobrazuyushchiye Aerobnyye Bakterii - Produktsenty Biologicheski
Aktivnykh Veshchestv], Kiev, Naukova Dumka, 1982, 278 pp

Moscow PRIKLADNAYA BIOKIMIYA I MIKROBIOLOGIYA in Russian Vol 20, No 2,
Mar-Apr 84 pp 300-302

DUDA, V. I., reviewer

[Abstract] This book represents a serious contribution on the genus *Bacillus*, drawing as it does on both Soviet and Western literature, as well as the authors' personal research. The topics covered include the physiology,

biochemistry, cytology, ecology and the systematics of this genus, with particular attention accorded to the production of various bioactive substances. The latter is the subject matter of the largest chapter (5th) in the book, and deals with antibiotics, enzymes, amino acids, vitamins, entomocides and other metabolites that have, or are expected to have, agricultural and medical use. It is pointed out that a book of this scope cannot help but serve as a major stimulus for further studies on this genus.
[1516-12172]

UDC 579.842.23:579.246

INVASIVE CHARACTER OF YERSINIA PSEUDOTUBERCULOSIS

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 5, May 84 (manuscript received 13 Sep 83) pp 26-30

TSENEVA, G. Ya., POLOTSKIY, Yu. Ye., YEFREMOV, V. Ye., DMITRIYEVA, G. M. and POLOTSKIY, V. Yu., Scientific Research Institute of Epidemiology and Microbiology imeni Pasteur, Leningrad

[Abstract] Comparative studies were conducted on the invasive capacity of several serovars of *Yersinia pseudotuberculosis* and *Y. enterocolitica*, using Hep-2 cell monolayer culture, conjunctival infection in guinea pigs, and enteric infections in mice and guinea pigs. The invasive character of *Y. pseudotuberculosis* isolated from patients became evident immediately following adhesion to target cells, with histologic evidence of multiplication within the Hep-2 cells and the epithelial mucosal, serosal and macrophage cells in the in vivo studies. Cell destruction was evident in the in vitro studies, while infected animals developed erosions, ulcers, suppurative lymphadenitis and systemic infections with miliary abscesses in the internal organs. The *Y. enterocolitica* strains under study failed to elicit conjunctivitis or enterocolitis, and in the tissue culture studies showed limited invasiveness without intracellular multiplication and cytopathology. Certain strains of *Y. enterocolitica* were completely noninvasive in tissue culture. Figures 5; references 19: 9 Russian, 10 Western.
[1529-12172]

UDC 579.842.14.083.13:615.371

MICROBIAL PATHOLOGY AND PHYSIOLOGY. PART 4. ECONOMIC AND METABOLIC COEFFICIENTS IN FUNCTIONAL ASSESSMENT OF SALMONELLA TYPHI

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 5, May 84 (manuscript received 1 Jul 83) pp 62-67

MEL'NIKOVA, V. A. and BASNAK'YAN, I. A., Central Scientific Research Institute of Vaccines and Sera imeni I. I. Mechnikov, Moscow

[Abstract] A previously described approach was utilized in assessing the physiological state of the facultative anaerobe, *Salmonella typhi* Ty₂ 4446,

in terms of metabolic (r_g) and economic (glucose) (Y) coefficients [Mel'nikova, IA, et al., Zh. Mikrobiol., No 1: 42-46, 1984]. Employing both batch and continuous cultures on casein and Lederberg's media demonstrated that the functional status of the bacterial population was determined by the phase of the culture, the composition of the medium, aeration and mixing parameters, rate of dilution in continuous culture, and the starting concentration of the energy substrate. The economic coefficient, Y, calculated for glucose was of primary importance as an indicator of the physiologic status of *S. typhi*, since high Y values corresponded to high viability. A fall in the value of Y below a certain critical level signified deterioration in the physiological status of the culture. Figures 3; references 9: 5 Russian, 4 Western.
[1529-12172]

UDC 616.9-022.39-084(571.1.6)

ACHROMOGENIC VARIANTS OF YERSINIA PESTIS ON NUTRIENT MEDIA AND IN ANIMAL BODY

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 5, May 84 p 114

MALININA, Z. Ye., MIKHEYEVA, T. M., DYAGILEVA, I. E. and RAKHMANOVA, O. V., Moscow

[Abstract] Experimental studies have shown that achromogenic variants of *Yersinia pestis* can be regularly isolated from fully virulent, low virulence and avirulent strains by multiple recultivation on liquid media with subsequent storage on solid and liquid media for prolonged periods of time at 28°C. However, multiple passages on solid media do not favor the survival of the achromogenic variants. Aeration alone is not a factor which favors or induces the formation of the achromogenic variants, but merely favors their growth and multiplication once such variants are present in a culture. Of the several antibiotics that have been tested, only streptomycin in a concentration of 0.76 or 1.56 µg/ml of broth culture favors induction of achromogenic variants. Achromogenic strains have also been reported to arise in guinea pigs and mice with a low frequency, although more readily in the latter. It appears that induction of the achromogenic variants is favored by less than optimal growth conditions and may represent an adaptive mechanism.
[1529-12172]

UDC 581.1.547.875.7

NEW MICROBIAL CYTOQUININE

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 275, No 5, Apr 84
(manuscript received 18 Jan 84) pp 1216-1219

MISHKE, I. V., MIKLASHEVICH, E. P. and TEVELEVA, M. K., Institute of Microbiology imeni Avgust Kirkhenshteyn, LaSSR Academy of Sciences, Riga

[Abstract] Natural phytohormones of cytoquinines include 6-(3-methylbut-3-enylamino)purine, 6-(4-hydroxyl-3-methylbut-2-enylamino)purine and their

ribosides, ribotides and conjugates with glucose and amino acids. The present article reports on attempts to develop a domestic Soviet cytoquinine as a product of microbial synthesis using natural sources in various taxonomic groups. The authors identified *Pseudomonas* sp. as suitable for such synthesis, and cultivated it in a mineral medium with mixing at 180 r.p.m. for 72 hours at 28°C. Purine was separated from the supernatant every 24 hours. Then its physicochemical properties were assessed, including chromatographic analysis after isolation in 3 solvents: *n*-butanol : ammonia at 84 : 16, *n*-butanol saturated with water, and isoprpanol : ammonia : water at 16 : 1 : 1. Spectroscopic and chromatographic data showed the compound separated to be a complex ester of hydroxycarboxylic acids of 6-aminopurine. This highly active cytoquinine affirms the occurrence of such purines in nature with a previously unknown substituent at the sixth position of the ring. Figure 1; references 14: 7 Russian, 7 Western.
[708-12131]

UDC 576.809.51

EFFECT OF IMMOBILIZATION, MOLECULAR HYDROGEN, ETHANE AND METHANE ON ACTIVITY OF METHANE GENERATING BACTERIA ASSOCIATIONS

Moscow PRIKLADNAYA BIOKIMIYA I MIKROBIOLOGIYA in Russian Vol 20, No 3, May-Jun 84 (manuscript received 24 Nov 83) pp 340-348

PANTSKHAVA, Ye. S., MALASHENKO, Yu. R., KARPENKO, V. I., CHAN DIN' TOAY and VARFOLOMEYEV, S. D., Institute of Biochemistry imeni A. N. Bakh, USSR Academy of Sciences, Moscow; Institute of Microbiology and Virology imeni Zabolotnyy, UkSSR Academy of Sciences, Kiev; Moscow State University

[Abstract] Results of study of the effect of conditions of immobilization, of the nature of the carrier, of molecular hydrogen, of ethane and of methane on the methanogenic activity of bacterial associations are described. All studies were carried out with suspensions of cells, or growing cultures, of a thermophilic methane-generating association, described earlier [Pantskhava, Mikrobiol. zhurnal Vol 44, 1982] as *Methanobacillus kuzneceovii* which uses methanol or acetate as a substrate. Experiments under the various conditions were done separately. Cells were immobilized on artificial or natural carriers, e.g., silochromes and various modifications of silochromes, cationite, anionite, asbestos, carbon, rocks from cores of Bugrinsk and Volgograd gas wells. The specific growth medium for each experiment is listed. The effect of molecular hydrogen and methane and ethane was studied on specific media. Conditions of experiments are stipulated. Promotion of methane production was found to be enhanced with fibrous asbestos as a carrier and also with the rocks from the Bugrinsk well; the other carriers had little effect or even suppressed methane generation. Molecular hydrogen promoted methane synthesis under conditions of the experiment; ethane inhibited production. Gas phase tests containing methane inhibited methane synthesis and led to H₂ and CO₂ formation on the bacterial cells substrate. Figures 8; references 8: 3 Russian, 5 Western.
[768-8586]

INHIBITOR OF PHOSPHOLIPASE C FROM STREPTOVERTICILLIUM MYCOHEPTINICUM

Moscow PRIKLADNAYA BIOKIMIYA I MIKROBIOLOGIYA in Russian Vol 20, No 3,
May-Jun 84 (manuscript received 6 Dec 82) pp 349-354

YAKOBLEVA, Ye. P., ROZHANSKAYA, T. I., LEVIT, Zh. D., SELEZNEVA, A. A.,
MYASNIKOVA, L. G., FATEYEVA, L. I. and POLYAK, M. S., All-Union Scientific
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[Abstract] Since literature available to the authors contained no reports of a search for microorganisms substances capable of inactivating phospholipase C, the present work was undertaken to select antibiotic-producing microorganisms which generate a phospholipase-inhibitor and to isolate and purify such an inhibitor from the culture liquid. Of microorganisms studied which elaborate antifungal antibiotics (*S. nodosus*, strain 0433, *Stv. mycoheptenicum*, strain 0090--which produces mycoheptin--and *S. levoris*, strain 28) the *Stv. mycoheptenicum* was found to produce an inhibitor of *Clostridium perfringens* phospholipase C. Inhibitor accumulation in the culture liquid was studied and a procedure for its purification, which employed adsorption, precipitation, ultrafiltration, gel chromatography and isoelectric focusing was worked out. The inhibitor was found to be a peptide, M. W. 3500-4000, occurring in two isoforms with isoelectric points of 8.15 and 8.50. Figures 3; references 20: 14 Russian, 6 Western.
[768-8586]

UDC 579.841.11.083.33

NATURE OF PSEUDOMONAS PSEUDOMALLEI ANTIGENS, COMMON FOR SOME SPECIES OF MICRO-ORGANISMS

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 3,
Mar 84 (manuscript received 21 Mar 83) pp 55-57

GONTAR', K. P., FARBER, S. M., YEFREMENKO, V. I., ZAKREVSKIY, V. I. and
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[Abstract] Isolation and study of an antigen complex of the causative agent of microorganisms and animal tissues are described and discussed. Use of affine chromatography on antibody sorbent produced, from an aqueous saline extract of *P. pseudomallei*, an antigen common for the causative agents of glanders, tularemia, plague, pseudotuberculosis, cholera and brucellosis. The common antigen has thermostability, resistance to pronase, high molecular mass, insignificant cathodic mobility and is a component of the O-antigen of the causative agent of melioidosis. Antigenic generality between the isolated biopolymer and animal tissues sensitive to melioidosis was established. Figures 2; references 7: 3 Russian, 4 Western.
[1526-2791]

UDC 616.717/718-001.45-001.5-089

TACTICS IN SURGICAL MANAGEMENT OF GUNSHOT FRACTURES OF TUBULAR BONES

Moscow-Khar'kov ORTOPEDIYA TRAVMATOLOGIYA I PROTEZIROVANIYE in Russian No 6, Jun 84 (manuscript received 11 Jul 83) pp 11-14

[Article by C.G. Karapetyan and V.P. Petrov, Central Hospital, Uambo, Peoples Republic of Angola]

[Text] The problem of gunshot wounds and the treatment of the wounded with gunshot fractures of the tubular bones, in particular, has always attracted the attention of surgeons and traumatologists. This problem is a timely one and is related above all, to the constant advancement in modern armaments, to its changing ballistic properties in comparison with earlier equipment, and to its effect on living tissue. Surgical therapy for this contingent of the wounded in the conditions of Angola has special features.

The functional anatomical result was the basis for formulation of the main principle which guided us during operative therapy for gunshot fractures of the tubular bones [9].

According to our observations, made in the orthopedic department of the Central Hospital of the Uambo Province, we found 1,361 wounded with gunshot fractures of the tubular bones.

Wounds of the extremities, made by modern armaments, are characterized by significant tissue destruction. There are extensive defects and crushing of muscle, and abundant contamination by clothes particles, dirt and so forth. Hemorrhage from wounds at the moment of admission to the medical station, as one would expect, was not observed.

The most prevalent type of gunshot fractures was fine- and large-splinter fractures. Amputation of extremity segments was observed in the majority of cases after mine and grenade explosions, but in children, amputation was used also after firearm injury (table 1).

As is evident from the data presented in table 1, the most prevalent type of wound was splinter fractures of the tibia (23.3 percent). In 17 wounded, we observed a defect in the tubular bone measuring 5 cm and more, together with crush fractures.

So-called tear fractures, mentioned in many manuals on battlefield surgery and traumatology, as a significant component percent of injuries, were almost never encountered, a finding related, in our opinion, to the use of modern forms of firearms which possess significant destructive force.

In Angola, the serious condition of those wounded by gunshot fractures to the tubular bones is intensified because of their late transportation to the medical station and the failure, in the majority of cases, to completely immobilize the patient during transportation. Because of this, the wounded are brought to the hospital in a state of shock, with marked anemia and, not infrequently, with a developing wound infection.

Таблица 1

Распределение раненых в зависимости от вида и локализации перелома

Вид перелома (1)	Локализация (2)			
	бедренная кость (3)	кости голеней (4)	плечевая кость (5)	кости предплечья (6)
Косопродольный (7)	61	57	45	62
Мелкооскольчатый (8)	44	67	51	33
Крупнооскольчатый (9)	106	189	75	48
Раздробленный (10)	84	61	82	36
Ампутация сегмента конечности (11)	83	124	33	20
Всего... (12)	378	493	286	199

Table 1. The Distribution of Wounded in Relation to the Form and Localization of the Fracture

Key:

- | | |
|---------------------|-------------------------------------|
| 1. Form of fracture | 7. Oblique-longitudinal |
| 2. Localization | 8. Fine-splinter |
| 3. Femur | 9. Large-splinter |
| 4. Tibia | 10. Shatter |
| 5. Humerus | 11. Amputation of extremity segment |
| 6. Forearm | 12. Total |

Таблица 2

Распределение больных по виду перелома и срокам остеосинтеза

Вид перелома (1)	Остеосинтез (2)				
	(3) первич- ный (до 48 ч)	раннеотсроченный (4)			
		(5) 3-6-е сутки	7-10-е сутки (6)	11-21-е сутки (7)	позднеотсро- ченный (21-е сутки и позже) (8)
Косопродольный (9)	63	39	35	—	—
Мелко- и крупно- оскольчатый (10)	5	37	463	21	3
Раздробленный (11)	3	12	161	18	18
Всего... (12)	71	88	659	39	21

Table 2. The Distribution of Wounded According to Fracture Type and Time Period for Osteosynthesis

Key:

- | | |
|-----------------------------|-------------------------------------|
| 1. Form of fracture | 7. 11-21st day |
| 2. Osteosynthesis | 8. Late repair (21st day and later) |
| 3. Initial (up to 48 hours) | 9. Oblique-longitudinal |
| 4. Early repair | 10. Fine- and large-splinter |
| 5. 3-6th day | 11. Shatter |
| 6. 7-10th day | 12. Total |

At the medical station, the first plan of action includes the introduction of measures for saving the life of the patient and the subsequent application of measures directed at preserving the function of the extremity.

We completely agree with those authors who consider that surgical treatment for gunshot wounds must be carried out regardless of the time of admission of the wounded.

For the majority of the wounded, on the day of admission to the hospital, the following primary surgical processes were carried out as the basis for antishock measures: excision of nonviable tissues, and removal of foreign bodies and fragments from the bones, freely lying in the wound and not related to the periosteal and surrounding tissues. In a prescribed order, the wounds were washed with antiseptic solutions (cetavlon, mercurochrome), after which the wound was dressed with a wide-spectrum antibiotic (hyperbiotic, chloramphenicol, tseporan, contreks and so forth) or injected with solutions of the above-mentioned antibiotics.

The overwhelming majority of wounded patients suffered from some kind of chronic disease, which was characteristic for the above-mentioned contingent

(chronic malaria, hepatitis, anemia, duodenitis, enterocolitis, tuberculosis, chronic bronchitis, nephritis, intestinal parasitic infection and others), in connection with which, during the first days of hospitalization, special therapy was administered.

During the first days of hospitalization, all manipulations for our patients were carried out on the basis of antishock therapy, which consisted of transfusion with appropriate blood type, and administration of a 5 percent solution of dextrose, analgesics, cardiotonics and wide-spectrum antibiotics. Dressing of wounds was conducted daily, and not infrequently, during dressing procedures, new foreign bodies were extracted from the wound (mine fragments, pieces of bone, bullets).

In our opinion, the principle of immediate surgical therapy for drainage and permanent suturing of gunshot wounds, for which a description can be found in several instruction manuals on surgery, is unacceptable treatment for gunshot fractures of the tubular bones, caused by modern forms of firearms.

We completely diverge from the opinion of A.N. Berkutov [1] that with protective antibiotics, osteosynthesis can be carried out given gunshot fractures of the tubular bones.

The advantage of operative immobilization lies in a more desirable fixation of bone fragments in the correct position. This enables prevention of local infectious complications, and improvement in functional results (early mobility for the patient, acceleration of consolidation) which are significant for the working conditions in Africa, and for the facilitation of management of patients without plaster casts.

Selection of the time period for conducting osteosynthesis given open fractures, as in the case of gunshot wounds, is a controversial question in the literature.

Thus, according to some authors [4,10,11], the period for operative intervention varies from 6-8 hours and up to 2-3 months. However, as is stated by V.D. Komarov and A.V. Kaplan [5,7], operative methods of therapy for open fractures in an early time period have clear advantages. Riska and co-authors [12] recommend conducting early-repair osteosynthesis within approximately 2 weeks after trauma, but Zanaski [13] adheres to a more active tactic, considering that given multiple trauma to the extremities, sometimes in 2 and even 3 bones, osteosynthesis should be carried out during the first 5 days after trauma.

As the final stage for radical surgical treatment, we carried out osteosynthesis in 878 wounded (table 2), using nail constructions of the Central Order of Labor's Red Banner Institute of Traumatology and Orthopedics imeni N.N. Priorov, of Kyuncher, the Scientific Research Institute for Experimental Surgical Apparatus, of Bogdanov, also with plates by Len, Kaplan-Antonov, with G-formed plates, screws, with spokes by Kirshner, and with the compression-distraction apparatus of Gudushaura and Kalnberz.

The largest number of operations (659) was carried out by us in the period of from 7 to 10 days, and delayed osteosynthesis was accomplished in 21 patients when the wound infection was successfully resolved in a later period.

In 17 patients, the presence of a defect in the tubular bone, equalling 5 cm or more, was replaced by an autotransplant, taken either from the collar of the tibia, or from the middle third of the fibula. All autotransplantations were conducted in combination with osteosynthesis in the period after the 21st day.

Of the 878 operatively treated patients, long-term (2 1/2 years) results were successfully recorded in 121 of them.

Good and satisfactory results were noted in 113 patients, of which 11 were post-autotransplantation. In 8 patients, results were negative (in 3 patients, a pseudo-articulation developed because of the wound stress on the afflicted extremity, in 5 patients, osteomyelitis of the leg bone developed, requiring us to remove the construction and to continue conservative therapy, in 1 patient following incorrect application of a circular plaster cast, dry gangrene of the foot set in, requiring exarticulation of the anterior section of the foot).

Conclusions

1. The overwhelming number of gunshot fractures to the extremities was characterized by a gaping exit wound, and the presence of large- and fine-splinters of bone. Amputations of extremity segments were observed, as one would expect, after mine and grenade explosions.
2. Surgical treatment of the wounded, given gunshot fractures of the tubular bones, does not have to be immediate and should terminate in deep suturing of the wound.
3. The majority of the wounded in Angola suffer from chronic diseases, characteristic of the given region, and from the first days of their hospitalization, they were treated with the appropriate therapy.
4. The most rational method of therapy for those wounded with gunshot fractures of the tubular bones, given their mass admission, is osteosynthesis by metal constructions and a compression-distraction apparatus.
5. Given the presence of defects in the tubular bones, measuring 5 cm or more, we consider it advisable, together with osteosynthesis, to conduct bone autotransplantation after complete cleansing of the wound.
6. The most optimal period for conducting osteosynthesis operations was the 7-10th day period, which was completely sufficient for elimination of infection and cleansing of the wound, as well as preparation of the patient for the operation.

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TRANSFUSION OF ABSORBED DONOR BLOOD UNDER CONDITIONS OF LONG-TERM STORAGE AND SEVERE TRAUMA

Leningrad VESTNIK KHIRURGII IMENI I. I. GREKOVA in Russian No 4, Apr 84
(manuscript received 20 Apr 83) pp 119-122

Article by I. I. Deryabin, K. Ya. Gurevich, V. G. Nikolayev, A. L. Belkin, I. N. Lipilkina, M. A. Vaganov, M. S. Povzhitkova, K. A. Pendrak, N. S. Nemchenko, and S. L. Medvedev; of the Military Medicine Academy imeni S. M. Kirov, Leningrad; Problems of Oncology Institute imeni R. Ye. Kavetskiy of the UkSSR Academy of Sciences; General and Inorganic Chemistry Institute of the UkSSR Academy of Sciences, Kiev

Text The transfusion of preserved blood is one of the most important components in treating patients suffering from severe mechanical traumas complicated by blood loss. Hemotransfusion, however, especially in large volumes, is far from being a risk-free procedure. Transfusions are often accompanied by transfusion reactions and complications; they often have an unfavorable effect on the acid-base, biochemical, and immunological states, on recipients' indicators of protein and carbohydrate metabolism, and on the systems of microcirculation and hemostasis [3, 5, 8, 10-12, 14]. These risks are most common for blood that has been stored for long periods (10-20 days). In light of this, it is easy to understand the opinion held by many researchers that it is not wise to make clinical use of blood that has been stored for more than 10 days [2, 6]. Naturally, prolonging the period during which stored blood can be used effectively is an important goal of both civilian medicine and military medicine.

Results obtained in laboratory tests on the absorption of blood that had been stored for long periods of time through SKN-2M nitrogen-containing charcoal made it possible to use absorbed preserved blood under clinical conditions in the treatment of patients suffering from severe trauma.

The aim of the present study was to determine the effectiveness of giving transfusions of absorbed blood that had been stored for long periods to patients suffering from severe trauma.

A total of 82 patients were studied who had come to the military and field surgery clinic of the Military Medicine Academy imeni S. M. Kirov with severe mechanical injuries; according to their vital signs they were given

transfusions of preserved donor blood that had been prepared in the TsOLIPK-7b preservative.

The patients were divided into 2 groups depending on the transfusion procedure that was used: the first group consisted of 48 patients who received transfusions of preserved blood that had been stored for 10-20 days and had been passed through the SKN-2M hemosorbent in hydroxyl form; the second group included 34 patients who were given transfusions of preserved blood that had been stored for 2-7 days. The majority of patients studied received 1-2 liters of blood. For a comparative evaluation of the effectiveness of the blood transfusions, 20 days after the trauma measurements were taken of arterial pressure, heart rate, the number of erythrocytes and leucocytes, the hematocrit, hemoglobin level, glucose, residual nitrogen, bilirubin, total protein and protein fragments, and plasma potassium. The number of T-lymphocytes [17] and B-lymphocytes [15] was measured to determine the patient's immunological status. An original method was used to determine the length of circulation and the deposit and sequestering of the transfused donor erythrocytes and the autoerythrocytes; the method involved using a standard labeling of erythrocytes with ^{51}Cr followed by radiometry of various organs and tissues.

A standard flask containing 350 ml of the sorbent was used as the mass exchanger in the sorption of preserved blood. After the flask was unsealed a rubber stopper was inserted with elements from two single-use systems for blood transfusions, one of which was used to connect the flasks with the blood. Up to 1 liter of blood was passed through this column at the required rate.

In a study of the hemodynamics, it was determined that indicators of blood circulation returned to normal by the second or third day and did not differ significantly between the groups of patients.

The following was determined by studying the hemogram: indicators of red blood were at satisfactory levels in both groups and did not differ significantly; leucocytosis was less pronounced with the transfusion of absorbed blood.

The dynamics of the biochemical indicators in the patients studied are presented in the table below. It was determined that in both groups the levels of glucose, residual nitrogen, bilirubin, and plasma potassium over the course of the entire study were within physiological limits and did not differ significantly. The total protein level increased gradually, and in the first group it increased as a result of a rise in the albumin fraction.

In both groups the dynamics of indicators of cellular and humoral immunity corresponded to values that are normal for changes due to trauma [7, 8], but with the transfusion of absorbed blood the restoration of indicators of cellular immunity was more pronounced, which indicates that the immunological reactivity of patients in this group was better. The lower rise in indicators of humoral immunity with the transfusion of absorbed blood indicates that there was less pronounced sensitization of the recipient's body. This is apparently tied to a reduction in the antigenicity of the preserved blood following absorption.

Biochemical indicators in patients' blood following transfusion

Indicator	Group of patients	Days following trauma			
		1	3	5	10
Glucose, mmol/liter	1	6.6+0.7	4.8+0.4	5.8+1.0	6.4+1.8
	2	7.9+1.3	4.9+0.4	5.5+0.4	6.2+0.6
Total protein, g/liter	1	59.0+3.0	60.0+1.0	58.6+2.4	70.1+1.1
	2	58.0+3.0	56.8+1.9	61.1+2.8	62.4+3.2
A/G ratio	1	1.18+0.11	1.87+0.29	1.47+0.24	1.07+0.46
	2	1.42+0.13	1.22+0.16	0.83+0.17	0.91+0.15
Plasma					
potassium mmol/liter	1	4.3+0.2	5.1+0.2	4.6+0.2	4.6+0.1
	2	4.7+0.1	4.3+0.2	4.2+0.1	4.4+0.6

Research data on the length of circulation of labeled erythrocytes indicate that in the central link of the circulatory system (using radiometry on the area around the heart) with similar dynamics of a gradual decline in the activity, the half-life (50 percent of the original activity) in the first group was 5.8 days; in the second group it was 9.6 days; and in the control group (with autoerythrocytes) it was 12.1 days.

A study of the relative concentrations of labeled erythrocytes (with respect to their action on organs and the heart) showed that with a transfusion of preserved blood the concentration increased in the patients' lungs, liver, and spleen three or four days following the transfusion. This phenomenon, which indicates that the donor blood is being deposited and sequestered, is less pronounced when absorbed blood is used.

The research done here allowed us to establish that the hemodynamic effect is the same with the use of absorbed preserved blood and fresh preserved blood. These data confirm the opinion that there is no difference in the hemodynamic effect depending on the length of storage of preserved blood used in transfusions [4, 16].

The detoxification effect of sorption on blood is confirmed both by the absence of any reactions, as well as the fact that when absorbed or fresh preserved blood was used in the transfusion the morphological and biochemical indicators of the recipients' blood practically did not differ, while negative effects can result from using ordinary preserved blood that has been stored for long periods of time [1, 13]. Furthermore, phenomena such as reduced deposit of transfused erythrocytes in the liver and a higher content of albumin fractions in the plasma offer indirect evidence of improved liver function with the transfusion of absorbed blood.

Indicators of the B-immune system and of the quantity of leucocytes in patients after a transfusion of absorbed blood offer evidence of a less pronounced sensitization. It is well known that the dynamics of immune reactivity can be reflected in the clinical course of a traumatic illness [9].

The results obtained here make it possible for us to recommend sorption of preserved blood that has been stored for a long period in the clinical practice of treating patients suffering from severe trauma.

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9967

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PURIFICATION AND CHARACTERIZATION OF BACTERIOPHAGE T4 RNA-LIGASE

Moscow PRIKLADNAYA BIOKHIMIYA I MIKROBIOLOGIYA in Russian Vol 20, No 2,
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BAKLANOV, M. M., RYAZANKIN, I. A., BUTORIN, A. S., NECHAYEV, Yu. S. and
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[Abstract] A procedure is described for the preparation of nuclease-free bacteriophage amN 82 RNA-ligase (EC 6.5.1.3). The technique involved growth of the virus in *E. coli* B, lysis of the cells, and subsequent fractionation on phosphocellulose, DEAE-cellulose, isoelectric precipitation, gel filtration on Sephadex G-100, and chromatography on hydroxyapatite and aminohexylsepharose to provide the enzyme in yields of 30-37%. The preparation was found suitable for use in experiments on molecular biology and genetic engineering, requiring the use of oligodeoxyribonucleotides and high MW RNA as substrates. The bacteriophage T4 RNA-ligase was effective in the synthesis of the nonaribonucleotide ApUpG(pU)₆ from the trinucleoside phosphate GpUpG and hexaribouridylic acid, and in the insertion of 5'-³²P-labeled cytidine-3', 5'-diphosphate into the 3'-end of bacteriophage MS2 RNA. Figures 3; references 14: 4 Russian, 10 Western.
[1516-12172]

DNA-LIKE DUPLEXES WITH REPETITIVE SEQUENCES. PART 8. SYNTHESIS AND PROPERTIES OF RESTRICTION ENDONUCLEASE EcoRII DNA SUBSTRATE FRAGMENTS

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(manuscript received 7 Feb 83) pp 370-381

GROMOVA, Ye. S., VINOGRADOVA, M. N., YELOV, A. A., VEYKO, V. P., DOLINNAYA, N. G., DRUTSA, V. L., METELEV, V. G., ORETSKAYA, T. S. and SHABAROVA, Z. A., Chemical Faculty, Interfaculty Scientific Research Problems Laboratory of Bioorganic Chemistry and Molecular Biology imeni A. N. Belozerskiy, Moscow State University imeni M. V. Lomonosov

[Abstract] Description is provided of a chemical method for the synthesis of a family of DNA-like duplexes that can serve as substrates for the restriction endonuclease EcoRII, as well as for EcoRI and AluI. The synthetic steps relied on the polycondensation of two nonanucleotides--d(CCTGGAATTp) and c(CCAGGAGCTp)--by water-soluble carbodiimides to form various complementary complexes, containing natural EcoRII sites, nucleotide substitution at the EcoRII site, unnatural bonds at the EcoRII sites (pyrophosphate, phosphoamide, etc.), or two flanked nucleotides in one or both strands. The resultant duplexes had regularly repetitive sequences of EcoRII, AluI and EcoRI sites. Gel filtration on Sephadex G-200 resulted in the isolation of products with a degree of polymerization ranging from 2 to 40, and a 70% yield of polymeric duplexes. Termination of condensation with dephosphorylated nonanucleotides results in the formation of dimers. The resultant concatenate duplexes possessed high melting points and their structural features were confirmed by UV and CD spectroscopies, as well as by cleavage products obtained with the use of EcoRII, AluI and EcoRI. Figures 9; references 14: 5 Russian, 9 Western.
[1535-12172]

UDC 547.963.32.04

ISOLATION AND CHARACTERIZATION OF PHAGE T7 DNA FRAGMENT CONTAINING PROMOTOR B WITH IN VIVO AND IN VITRO ACTIVITY

Moscow MOLEKULYARNAYA BIOLOGIYA in Russian Vol 18, No 2, Mar-Apr 84
(manuscript received 1 Nov 82; in final form 17 Apr 83) pp 397-403

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[Abstract] Standard techniques of molecular biology were employed in utilizing restriction endonuclease AluI in isolating a 124 bp fragment of phage T7 DNA, its subsequent splicing into plasmid pSK genome, and eventual transformation of E. coli C600 cells and selection of clones. The fragment in question

represented the sequence between base pairs 1401 and 1525 of the phage T7 genome, proceeding from the left end of the DNA molecule. In both in vitro and in vivo E coli systems, the 124 bp fragment was found to act as a promotor for RNA-polymerase, with the in vitro transcription initiated by GTP. Transcription was initiated 25 bp from the 3'-end of the fragment, with subsequent mapping studies showing that it can serve for the transcription of all early phage T7 genes, with the exception of genes 0.3, 0.4 and 0.5. Figures 6; references 21: 6 Russian, 15 Western.
[1535-12172]

UDC 547.962:541.63

DISTRIBUTION OF AMINO ACID MOIETIES IN PRIMARY PROTEIN STRUCTURE

Moscow MOLEKULYARNAYA BIOLOGIYA in Russian Vol 18, No 2, Mar-Apr 84
(manuscript received 18 Apr 83) pp 541-547

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[Abstract] An analysis was conducted on the distribution of amino acids in 180 various proteins to determine underlying criteria determining amino acid sequence in primary structure. Distribution of the amino acids was found to be determined by the amino acid composition of the proteins and, in that sense, constitutes a statistical phenomenon. A distinction was made between the statistical and 'unique' characteristics, which demonstrated that the primary structure of fibrous proteins is 'unique', i.e., is predicated on the repeatability of a given block of segment of amino acids. Globular proteins, however, seem to adhere more strictly to the statistical concept. In the latter case, this could be used to explain sensible text generation by frame shift mutations, deletions, or insertions in the genome. Figures 2; references 20: 8 Russian, 12 Western.
[1535-12172]

UDC 577.152-277.6'152"577.212.3:547-963.32.04

T7 PHAGE RNA-POLYMERASE: CLONING AND SEQUENCING OF GENE

Moscow BIOORGANICHESKAYA KHIMAYA in Russian Vol 10, No 6, Jun 84
(manuscript received 18 Oct 83) pp 824-843

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[Abstract] Attention is called to an earlier publication, by the authors, of the complete primary structure of gene 1.0 of T7 phage which codes for RNA-polymerase of T7. Further, it is noted that a separate report [Stahl and Zinn, J. Mol. Biol, 1981, 148, 4] simultaneously described the gene structure. A

detailed discussion of the gene structure and differences in the approaches of the separate research groups is presented. The present report exhaustively describes the cloning, in a plasmid vector, of gene 1.0 of T7 bacteriophage which codes phage-specific RNA-polymerase. One of the synthesized clones, *E. coli* K-12 HB 101 (pSK-T7-1.0a), realizes expression of gene 1.0 since an extract of it stimulates synthesis of RNA on a matrix of T7-DNA in the presence of rifampycin. Analysis of the primary structure of fragments of gene 1.0, which were separated from the plasmid pSK-T7-1.0a, made it possible to establish the precise sequence of nucleotides in that gene (a sequence already independently confirmed in other laboratories). Another recombinant plasmid, pSK-T7-1.0b, based on restriction mapping data, did not differ from the pSK-T7-1.0a except that it did not induce synthesis of the rifampycin-resistant RNA-polymerase. The latter difference was attributed to loss, by the gene 1.0, of a thymidine residue. Aminoacid composition of T7 RNA-polymerase is tabulated. Implication of the authors' findings are discussed in detail. Figures 6; references 37: 10 Russian, 27 Western.
[1538-8586]

UDC 577.214.3

TERMINATION OF DNA TRANSCRIPTION BY POLYNUCLEOTIDE (dA)·(dT) INSERTED INTO PLASMID pBR325

Moscow MOLEKULYARNAYA BIOLOGIYA in Russian Vol 18, No 3, May-Jun 84
(manuscript received 30 Dec 82; in final form 26 May 83) pp 599-606

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[Abstract] Transcription mechanisms were studied in an in vitro *E. coli* system using plasmid pBR325 DNA with inserted 80-100 bp polynucleotide (dA)·(dT) (PAT). The PAT fragment was inserted into the plasmid DNA at the EcoRI site. Analysis of the RNA products obtained by transcription of the native pBR325 DNA and the recombinant DNA with the PAT fragment possessing sticky ends, showed that transcription of the former yielded RNA molecules 500 and 790 nucleotides long, whereas the recombinant DNA yielded RNA 460 and 600 nucleotides in length. Analysis of the RNA products showed that the 3'-ends of the RNA molecules synthesized on a template of recombinant DNA were enriched in UMP, vis-a-vis the products obtained on native DNA. This fact, in conjunction with the shorter length of the RNA products transcribed from recombinant DNA, indicates that the PAT fragment within the recombinant DNA molecule functions as a terminator of transcription. Figures 4; references 17: 3 Russian, 14 Western.
[1536-12172]

SELECTION ALKYLATION OF POLYADENYLIC FRAGMENTS OF mRNA OF KREBS-2 ASCITIC CARCINOMA CELLS BY ALKYLATING DERIVATIVES OF NONATHYMYDYLURIDINE

Moscow MOLEKULYARNAYA BIOLOGIYA in Russian Vol 18, No 3, May-Jun 84
(manuscript received 12 Jan 83; in final form 24 Apr 83) pp 613-619

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[Abstract] Studies were conducted on the putative usefulness of unesterified oligonucleotides as targets for intracellular complementarity-based alkylation, using as a model system Krebs-2 ascitic carcinoma cells and 2',3',-O-[4-(N-2-chloroethyl-N-methylamino)]-benzylidenenonathymidyluridine (I) as the alkylating agent. The analytic data showed that I enters the target cells with high efficiency and alkylates a variety of intracellular macromolecules. However, approximately 30% of the alkylating agent attack nucleic acids. In alkylation of a stable complementary complex the degree of alkylation of poly(A) fragments in mRNA was two orders of magnitude greater than the alkylation of the remaining mRNA segments. These observations indicate that complementarity-based selective alkylation can be achieved not only with the negatively charged deoxyribooligonucleotide reagents, but also with nonionic analogs of deoxyribooligonucleotides. Figure 1; references 17: 11 Russian, 6 Western.
[1536-12172]

UDC 577.322.4

THEORETICAL CONFORMATIONAL ANALYSIS OF MCD PEPTIDE

Moscow MOLEKULYARNAYA BIOLOGIYA in Russian Vol 17, No 6, Nov-Dec 83
(manuscript received 1 Nov 82) pp 1212-1219

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[Abstract] A theoretical analysis was conducted on the conformational aspects of the MCD (mast cell degranulating) peptide isolated from bee venom, based on the known amino acid sequence of its 22 amino acids. The approach consisted of evaluation of low-energy conformational states of successively increasing peptide fragments, with the conformational energy calculated by the atom-atom potential method involving electrostatic interactions, rotational contributions, and hydrogen bonding. The resultant calculations presented a three-dimensional structure for MCD peptide with two disulfide bonds, at Cys³-Cys¹⁵ and Cys⁵-Cys¹⁹, and is in agreement with published NMR and CD spectroscopic data on this peptide. The MCD peptide was shown to share considerable conformational similarity with the homologous tertiapin peptide isolated from bee venom. Figures 3; references 11: 2 Russian, 9 Western.
[1533-12172]

THEORETICAL AND EXPERIMENTAL STUDIES ON HINGE REGION OF HUMAN IgG SUBCLASSES

Moscow MOLEKULYARNAYA BIOLOGIYA in Russian Vol 17, No 6, Nov-Dec 83
(manuscript received 27 Dec 82) pp 1262-1271

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[Abstract] The hinge region of the various subclasses of human IgG was studied by differential adiabatic scanning microcalorimetry and differential thermal perturbation spectrophotometry. The conformational characteristics of the hinge regions both in the intact IgG molecules and in the Fc subunits were found to differ significantly from subclass to subclass. This was based on the observed differences in the energies of interaction between the C_H2 and the C_H3 domains, as well as on the differences in the structural rigidity of the N- and C- termini of the C_H2 domains. The data indicate that the hinge region interacts with the C_H2 domains, and that the differences in the hinge region affect the conformational status of the Fc subunit of IgG. Theoretical spatial models have been proposed for the hinge regions of IgG₁, IgG₂ and IgG₄, and of the disposition of the respective hinge regions relative to C_H2 domains. The proposed models are supported by data obtained by small-angle x-ray scattering. It appears, therefore, that the hinge region determines not only the degree of flexibility of the IgG, but also influences other structural and functional parameters of the antibody molecule. Figures 5; references 34: 3 Russian, 31 Western.
[1533-12172]

UDC 577.113.4

REACTION OF FORMALDEHYDE WITH NUCLEIC ACIDS AND THEIR STRUCTURAL COMPONENTS
IN PRESENCE OF PRIMARY OR SECONDARY AMINES

Moscow MOLEKULYARNAYA BIOLOGIYA in Russian Vol 17, No 6, Nov-Dec 83
(manuscript received 23 Jul 82) pp 1318-1323

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[Abstract] The reactions of formaldehyde in the presence of primary or secondary amines with DNA, cytosine and its derivatives, and with adenine and deoxyadenosine were followed by UV absorption spectroscopy and also analyzed in terms of the reaction kinetics. Reaction of formaldehyde alone with cytidine or adenine, or in the presence of methylol derivatives of secondary amine, yielded products having identical structures, while reactions in the

presence of primary amines yielded products having different structures. Denaturation of DNA was accelerated only in the presence of the primary amines in 0.1 M sodium phosphate buffer, pH 6. Furthermore, cytosine and cytidine were modified only in the presence of the primary amines with accompanying spectral changes indicative of protonation. Formation of six-membered cyclic products having a triazine structure appears to be a general feature of the reaction of formaldehyde with nucleic acid bases in the presence of primary amines. Figures 3; references 9: 5 Russian, 4 Western.
[1533-12172]

UDC 577.113.4

NEW TYPE OF DNA MODIFICATION. SITE SPECIFIC INTRODUCTION OF 3'-5'-PYROSPHOSPHATE
INTERNUCLEOTIDE BONDS

Moscow BIOORGANICHESKAYA KHIMIYA in Russian Vol 10, No 3, Mar 84
(manuscript received 19 Apr 83; after revision 13 Sep 83) pp 394-400

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[Abstract] A new type of modified DNA duplex has been synthesized, containing a 3'-5'-pyrophosphate internucleotide bond. The chemical-template-guided synthesis was carried out with the self-associating decanucleotide pTGGCCAAGCTp (I), made from 1-ethyl-3-(3'-dimethylaminopropyl)carbodiimide (CDI), imidazole to protect the 3'-phosphate and T₄-polynucleotide kinase. Microbore ion exchange chromatography indicated yields of 90-98%. I was not cleaved by phosphodiesterases. The melting curves of I were similar to those of the starting monophosphate decanucleotide, indicating the formation of DNA-like duplexes. Polycondensation of I was carried out with CDI and electrophoretic studies. The data indicated the almost complete absence of I after three days. Sedimentation analysis indicated that the polycondensate contained 200-220 monomers. The condensate was completely cleaved to I by trifluoroacetic anhydride, indicating the presence of an internucleotide pyrophosphate bond. Restriction endonucleases BspI and HindIII cleave the polycondensate, but AluI does not, confirming the 3' to 5' direction of the bond. The proximity of the pyrophosphate bond to the recognition and cleavage sites of AluI appears connected to the lack of activity seen with this enzyme. This may permit the development of unhydrolyzed substrate analogues for mechanical and structural studies of endonucleases. Figures 3; references 15: 6 Russian, 9 Western.
[1521-12126]

PRIMARY STRUCTURE OF E. COLI DNA FRAGMENT PRECEDING TRYPTOPHAN OPERON GENES

Moscow BIOORGANICHESKAYA KHIMIYA in Russian Vol 19, No 3, Mar 84
(manuscript received 30 Nov 83) pp 415-417

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[Abstract] The E. coli tryptophan promoter is often used in genetic engineering to permit gene expression. In order to aid in selecting the operon region, the nucleotide sequence of the 1179 base pairs preceding the tryptophan operon was determined. The fragment was cloned with the pBR322 plasmid, and was removed with EcoRI and PstI endonucleases. Fragment cleavage was accomplished with Sau3AI, HpaII, AluI or mixtures of TaqI + HinfI or BspRI + MvaI. Sequence was determined by the Maxam-Gilbert method. The largest open reading frame in the sequence, as determined by computer analysis, is 291 base pairs long, which is too short to code for a structural gene. The sequence appears to be an intercistronic region with possible regulatory function. Figures 2; references 10: 1 Russian, 9 Western.
[1521-12126]

UDC 577.213.37:578.827.2

STABILITY OF HYBRID PLASMIDS WITH POLYOMA VIRUS DNA REPLICATING IN SACCHAROMYCES CEREVISIAE

Moscow MOLEKULYARNAYA BIOLOGIYA in Russian Vol 18, No 1, Jan-Feb 84
(manuscript received 15 May 83) pp 21-29

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[Abstract] Four hybrid plasmids (pSP97, pSP155, pSP113, pSP114) were constructed as previously described [Oganessian, NA, et al., Dokl. AN SSSR, 267:1237-1239, 1982], containing polyoma virus (PY) DNA (including initiation region for viral DNA replication) and Saccharomyces cerevisiae gene arg4 (selective marker), to determine whether animal virus DNA can support plasmid replication in yeast cells. Transformation of S. cerevisiae with pSP97, which contained the entire PY genome, occurred with a high frequency (10^{-2}) and resulted in autonomic replication of pSP97 in the host cells with retention of plasmid structure and high stability (44-100%) of the arg^+ trait. Plasmid pSP155, containing the PstI fragment (1.0 MD) of the PY DNA which includes the replication initiation region, transformed the yeast cells with a frequency of 0.5×10^{-2} , and replicated with production of normal and altered plasmids and a trait stability of 23-29%. Plasmids pSP113 and pSP114 transformed the yeast cells

with a low frequency (10^{-5} to 10^{-4}), contained the 1.0 MD EcoRI-HindIII PY DNA fragment, and also showed autonomous replication. Stability of the arg^+ trait in both cases was 100%, however, while sSP113 retained its structural features, alterations were found in sSP114 in which the arg4 gene was oriented in the reverse direction to that found in sSP113. Figures 3; references 25: 2 Russian, 23 Western.
[1534-12172]

UDC 579.25.5:579.842.11:578.245.2

EXPRESSION OF MUTANT HUMAN α_2 -INTERFERON IN ESCHERICHIA COLI

Moscow MOLEKULYARNAYA BIOLOGIYA in Russian Vol 18, No 1, Jan-Feb 84
(manuscript received 28 Jul 83) pp 48-59

OVCHINNIKOV, Yu. A., SVERDLOV, Ye. D., MONASTYRSKAYA, G. S., TSAREV, S. A., ZAYTSEVA, Ye. M., ARSENYAN, S. G., CHAKHMAKHCHEVA, O. G., NOVOKHATSKIY*, A. S., ASPETOV*, R. D. and KUZNETSOV**, V. P., Institute of Bioorganic Chemistry imeni M. M. Shemyakin, USSR Academy of Sciences, Moscow; *Institute of Virology imeni D. I. Ivanovskiy, USSR Academy of Medical Sciences, Moscow; **Institute of Epidemiology and Microbiology imeni N. F. Gamaleya, USSR Academy of Medical Sciences, Moscow

[Abstract] A bank of cDNA molecules were obtained by reverse transcription of mRNA derived from human leucocytes producing interferon following induction with Newcastle disease virus, which were subsequently cloned in *E. coli* and analyzed by means of synthetic oligonucleotide probes. One of the positive clones contained a DNA fragment that was homologous to the gene for α_2 -interferon (IFN- α_2), with but a single G $\rightarrow$ A substitution in the conservative N-terminus. This resulted in a Ser⁸ $\rightarrow$ Asn⁸ substitution in the conservative Thr⁶-His⁷-Ser⁸-Leu⁹ segment of IFN- α_2 , with the mutant interferon designated as IFN- α_2' . The complete gene for the mutant interferon was reconstructed for direct expression in *E. coli* under the control of *E. coli* trp operon promoter. The antiviral activity of IFN- α_2' in human diploid fibroblast cells was essentially identical to that of IFN- α_2 , and both species of interferon behaved identically in reaction with monoclonal antibodies (NK-2) directed against IFN- α_2 . Figures 6; references 24: 4 Russian, 20 Western.
[1534-12172]

3'-TERMINAL NUCLEOTIDE SEQUENCE OF BARLEY STRIPE MOSAIC VIRUS RNA

Moscow MOLEKULYARNAYA BIOLOGIYA in Russian Vol 18, No 1, Jan-Feb 84
(manuscript received 10 Oct 83) pp 140-145

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[Abstract] Structural studies were conducted on the 3'-terminus of the noncoding region of RNA-2 derived from barley stripe mosaic virus. The noncoding segment consists of more than 250 nucleotides with the 3'-sequence of approximately 100 nucleotides forming a tRNA-like acceptor for tyrosine. Within the non-coding region a heterogenous in size oligo(A) block is located at a distance of 236 nucleotides from 3'-end and, apparently, serves to separate the coding and noncoding segments of the viral RNA-2. Two structural possibilities are proposed for the terminal 100 nucleotides based on the secondary structures reported for tRNA molecules, in analogy to similar findings in cucumoviruses and bromoviruses. Figures 2; references 19: 1 Russian, 18 Western.
[1534-12172]

UDC 577.152.277:577.151.45

REACTION OF BamHI RESTRICTION ENDONUCLEASE WITH SYNTHETIC SUBSTRATES CONTAINING COMPLETE OR PARTIAL RECOGNITION SEQUENCE

Moscow MOLEKULYARNAYA BIOLOGIYA in Russian Vol 18, No 1, Jan-Feb 84
(manuscript received 15 Jul 82) pp 169-175

ZINOV'YEV, V. V., KOLESNIKOV, V. A., BEZNEDEL'NAYA, N. L., GILEV, A. F.,
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[Abstract] Further studies were conducted on substrate specificity of BamHI restriction endonuclease isolated from *Bacillus amyloliquefaciens*, by using three synthetic polynucleotides and analysis of the cleavage products. The specific substrate sequence for BamHI consists of G/GATCC, with the slash indicating which phosphodiester bond is split. Cleavage of the polynucleotides CGGATCCG and CCAGGATCCTGG yielded, respectively, 5'-di- and tetranucleotides of the expected composition CG and CCAG. However, cleavage of TCCAGATCTGGA, which contains GATC in the middle and is flanked by GGA and TCC, yielded three products 11, 10 and 9 nucleotides long with G, G and T at the 3'-end, respectively. These findings indicate that cleavage to the left of the GATC sequence did not take place, and that the results could be explained by assuming that a GGA...TCC sequence was recognized. Such would be the case if two ends of different duplex molecules came together. Figures 6; references 15: 1 Russian, 14 Western.
[1534-12172]

PERSPECTIVES AND ACHIEVEMENTS IN CREATION OF VIRAL VACCINES BY GENETIC ENGINEERING

Moscow MOLEKULYARNAYA BIOLOGIYA in Russian Vol 18, No 1, Jan-Feb 84
(manuscript received 2 Jul 83) pp 176-188

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[Abstract] Literature, for the most part Western, is surveyed on the promise and achievements of recombinant DNA technology in the creation of viral vaccines. From a historical perspective, several stages can be discerned in such attempts, including the initial attempts at reproduction of whole capsids in microbial and eukaryotic systems. The so-called second generation attempts consisted of cloning individual antigenic determinants of viral proteins. Current studies in genetic engineering stress the advantages of multiviral vaccines having antigenic determinants from different viruses, along with attempts at purely chemical synthesis of capsid antigens and the use of conservative portions of capsid protein. In addition to dealing with subunit-type of vaccines, genetic engineering technology can also be harnessed for the production of live virus vaccines, which consist of attenuated viruses whose DNA bears a natural or synthetic gene coding for a capsid protein or a chimeric protein with antigenic determinants of another virus. Figures 1; references 53: 10 Russian, 43 Western.
[1534-12172]

UDC 577.212.2:579.252.5

GENE CLONING IN BACILLI

Moscow MOLEKULYARNAYA BIOLOGIYA in Russian Vol 18, No 1, Jan-Feb 84
(manuscript received 28 Jun 83) pp 189-196

RABINOVICH, P. M., YOMANTAS, Yu. V., KHAYKINSON, M. Ya. and STEPANOV, A. I., All-Union Scientific Research Institute of Genetics and Selection of Industrial Microorganisms, Moscow

[Abstract] An evaluation was made of the role of direct and inverted repeat sequences in plasmid DNA in transformation of *Bacillus subtilis*, using the riboflavin operon of *B. subtilis* spliced into vector plasmid pUB110, and sequential marker rescue in the *B. subtilis* recE4 cells. The helper plasmid consisted of pJJ108 containing the distal portion of the rib operon, with the proximal portion of the rib operon introduced into the *B. subtilis* recE4 cells via plasmid pJJ105, which was amplified in *E. coli* with the assistance of plasmid pBR322. Salvage of pJJ105 due to homology between the ribB gene and pBR322 DNA led to formation of plasmid pJJ110. The latter plasmid contained all the genes of the riboflavin operon within a 6.3 MD EcoRI fragment of the DNA. A hybrid plasmid, pMX1, obtained in *E. coli* which contained the EcoRI

fragment with the riboflavin operon, vector pBR322, and two genomes of pBU110, was capable of transforming *B. subtilis* recE4 with monomeric forms of DNA. Consequently, direct repeats impart capacity for cloning relatively large MW DNA fragments in bacilli. However, since vectors with direct repeats require preliminary amplification in *E. coli* because direct repeats are unstable in *B. subtilis* recE4⁺ and recE4⁺ cells, streptococcal plasmid pSM19035 with inverted repeats was utilized for cloning DNA in *B. subtilis*. The latter vector facilitates the accumulation of large quantities of the 6.3 MD DNA fragment in *B. subtilis*. The basic scheme for the transformation of the bacilli with inverted repeats appears to involve notching of the DNA, penetration of single-stranded DNA into the cell, formation of dumbbell-like structure, repair, replication and formation of the starting circular DNA. Figures 10; references 16: 9 Russian, 7 Western.
[1534-12172]

NONIONIZING ELECTROMAGNETIC RADIATION EFFECTS

MEDICAL USE OF MAGNETIC FIELDS (original article entitled MAGNET DOCTOR)

Moscow NEDELYA in Russian 21-27 May 84 N 21 p 10

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[Abstract] Developments in medical use of magnetic fields are discussed. Vitebsk Medical Institute associates are developing a new magnetic field therapy technology. New types of magnetic and electronic devices for creating different kinds of magnetic fields or for monitoring treatment by magnetic fields are being developed. A problem commission "Magnetobiology and Magnetotherapy" is being developed at the institute. Vitebsk Medical Institute specialists use magnetic fields in treatment of chronic bronchitis, bronchial asthma, radiculitis and polyarthritis. Associates of Rostov Oncological Institute have reported discovery of adaptational reactions of the organisms which extends the idea concerning stress as a reaction to strong stimuli by including the idea of a "training reaction", reaction of the organism to weak stimuli and "activation reaction", reaction of the organism to moderate stimuli. This calls for feedback to assess the reactivity of the body to magnetic fields and selection of an individual dose according to the patient involved and the problem at hand. Some aspects of the use of magnetic fields for medical purposes over the centuries are recounted.

[663-2791]

DANGER OF FAD DRUGS, FOLK REMEDIES

Kiev RADYANS'KA UKRAYINA in Ukrainian 21 Jun 84 p 4

[Article, published under the heading "To Your Good Health," by Honored Health Worker Ukrainian SSR, pharmacy manager, Main Administration, UkSSR Ministry of Health M. Koshchak: "Drugs Can Be Friends, Drugs Can Be Enemies"]

[Text] Everybody knows that the more powerfully drugs act, the more dangerous they are. For this reason doctors endeavor to use with extreme caution such strong-acting preparations as hormones, antibiotics, and drugs which affect higher nervous activity. And yet these are the most popular with the public. Today almost everybody can obtain at the neighborhood pharmacy remedies against headache, sleeplessness or a bad mood, cough or cold. And people take them at the slightest indication of an ailment. Today's arsenal of medicines totals 5,000 different items. Unfortunately a sufficiently effective medicine has not been found against many diseases. There is a large group of medicines which offer only some relief or easing of the condition. Nevertheless most frequently these very medicines become attributes of self-curing, when in the search for a nonexistent panacea, a patient seeks to try all the remedies about which he has heard.

Of course everybody should possess rudimentary knowledge of a general nature in order to provide emergency medical assistance to oneself or one's loved ones in the case of a sudden illness or accident. Things should not go beyond first-aid measures. And yet among a certain segment of the public there still prevail a great many superstitions and misconceptions about the significance and effect of medicines. People sometimes do a great deal of detriment to themselves precisely by the unwise taking of medicines! Typically a person who does not possess special knowledge is highly unlikely to undertake to repair a TV set or refrigerator, for example. And yet almost everybody sets about to "repair" the human organism -- nature's most complicated creation.

Sometimes half-baked "consultants" would seem to proceed from a fairly solid position. Somebody has treated himself, and with success, with some medicine on a doctor's recommendation, and another person has read an article in a magazine about new remedies by a prominent professor. It is essential to realize, however, that there do not exist any ready-made, uniform prescriptions for treating a given disease. Herein lies the art and skill of the physician, the fact that he treats not a disease but rather a patient.

The specialist's counsel changes on the basis of a great many factors: the pathogen involved, the specific peculiarities of treating the disease, the presence of other, attendant ailments in the patient, reaction to drugs, functional capabilities, and other specific features of the organism.

In addition to self-treatment, one also encounters fads for specific remedies. You will recall that the fad of "jogging to prevent a heart attack" and special diets had not yet died down when another fad for eating raw foods and taking saunas started up.... And dozens of patients go to doctors and tearfully beseech them to prescribe certain specific and only those specific procedures or remedies. Some patients are convinced that somewhere there must be a "wonder" drug which will cure their every ailment. They endeavor to obtain a "miracle cure," searching in Kiev, Moscow, and turning to scientific research institutes. If the doctor tells them in all honesty and frankness that there are no reliable remedies for the given ailment and that with a certain regimen the system itself may gradually overcome the ailment, such "experts" may lose all faith in such a doctor.

At various times miraculous powers were ascribed to gamalone, which allegedly cures paralysis, stugerone, which supposedly prevents stroke, and protectine, which prevents heart disease. Isoptine, intercordine, obzidan and other drugs were in great demand. He who would obtain them by hook or crook, taking them at his own risk, expecting a swift cure, would soon become disenchanted, for no miracle would happen, nor could a miracle happen, for each of the above-enumerated highly-effective medicines should be prescribed with quite specific indications, as a rule over an extended period of time and in combination with other remedies.

The problem of "fashionable" medicines cannot help but cause concern. Enthusiastic publicity about any medicine inevitably leads to its unwarrantedly extensive use and to heightened risk of side effects and complications. In connection with adverse side effectss on the organism caused by certain drugs, today some people are persistently arguing the need to return to natural medicine, especially treatment with medicinal herbs. Enthusiasm over herbs and herbal infusions is frequently grounded on ignorance. He who, replacing pills with herbs gathered in the woods or purchased at the open-air market, thinks that with this he has avoided "harmful chemicals" is deeply in error. If some decoction does in fact act on the organism, it is only because it contains certain chemical compounds and biologically active molecules. Of course such remedies as valerian root, the curative properties of which have long been known to medicine, can be used with cardiovascular ailments and neuroses. But valerian extract tablets are in no way inferior to the root! The conclusion is obvious: folk remedies should be used only to the extent that they do not impede or hinder active treatment of the patient.

Total rejection of medicines is out of the question. It is precisely advances in modern pharmacology which have enabled doctors to conquer the majority of infectious diseases, to treat diseases which had been considered incurable, and to make progress in combating cardiovascular and pulmonary diseases, nervous disorders, tumors, and other diseases.

The role and significance of medicines in the campaign to improve man's health and increase his longevity are growing year by year, as science delves deeper into the mysteries of life. Brilliant advances in pharmacy, biology, biochemistry, and chemistry of synthetic compounds is a guarantee that many new and highly effective medicines will be developed in the near future. But intelligent use of medicines remains an essential condition for the successful treatment of various diseases.

3024

CSO: 1840/727

UDC 616.9-084:615.331.03(048.8)

BACTERIOCINS: PROSPECTIVE PROPHYLACTIC AND THERAPEUTIC USE

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 5, May 84 (manuscript received 11 Oct 83) pp 10-14

BLINKOVA, L. P., Central Scientific Research Institute of Vaccines and Sera imeni I. I. Mechnikov, Moscow

[Abstract] A literature review is presented of the current status of knowledge about bacteriocins derived from gram-positive and gram-negative bacteria. Coverage is accorded to their physicochemical characteristics and antigenic properties, as well as studies on toxicity and spectrum of antibacterial activity. Of the 140 bacteriocins that have been identified to date, only some 3-5% have found use in human and veterinary medicine as antibacterial agents. Their low rate of clinical application is largely due to extreme toxicity for the host organism. Studies have been undertaken on the chemical modification of the various bacteriocins to minimize side effects and antigenicity, and search is being conducted for nontoxic bacteriocin-producing bacterial strains. The basic technology of bacteriocin production consists simply of culture growth, removal of the cells and, when necessary, special purification. References 48: 11 Russian, 37 Western.
[1529-12172]

UDC 615.276.4:422.22].015.46

ANTIGENICITY OF NITROAROMATIC DERIVATIVES OF POLYETHYLENE GLYCOL

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 5, May 84 (manuscript received 13 Jun 83) pp 15-20

KABANOV, V. A., TOPCHIYEVA, I. N., KAZANSKIY, K. S., PETROV, R. V., KHAITOV, R. M. and KHAUSTOV, L. I., Institute of Biophysics, USSR Ministry of Health, Moscow

[Abstract] Mono (I) and disubstituted (II) nitroaromatic derivatives of polyethylene glycol (PEG) were synthesized to test the antigenicity of such conjugates by the Jerne plaque technique, and to determine whether the antibody response is T cell-dependent. Using PEG with one or two terminal hydroxyl

groups and 2,4-dinitrophenyl, 2,4,6-trinitrophenyl (TNP), and trinitrophenyl-ethyl haptens, the corresponding derivatives were used for immunization of (CBA x C57BL) F_1 and athymic nude mice. Immunization with 5-1000 μ g of PEG-I or PEG-II showed a dose-dependent response in terms of splenic antibody forming cells, which increased from 3300 ± 200 cells to $1,500 \pm 380$ cells in going from 5 μ g to 1000 μ g, against a 1970 ± 100 cell baseline level when tested with TNP-conjugated sheep RBC. An antibody response was only elicited by the PEG-I preparations, while PEG-II preparations lacked antigenicity. Studies with the 1000 μ g dose demonstrated that peak antibody formation occurred on the third post-immunization day, and that the antibody response was T cell-independent. The antigenic effectiveness of PEG-I conjugates was attributed to weaker electron-donor interactions between the hapten and the PEG carrier and, consequently, greater accessibility of the haptenic domains to the B cell surface receptors. Figures 5; references 14: 9 Russian, 5 Western.
[1529-12172]

UDC 579.842.15.083.3

ISOLATION AND PURIFICATION OF BACTERIAL RIBOSOMES FROM ENDOTOXIN BY POLYETHYLENE GLYCOL

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 5, May 84 (manuscript received 17 Jun 83) pp 20-25

LEVENSON, V. I., GORACH, G. G., DADASHEV, S. Ya. and RUKHADZE, E. Z., Moscow Scientific Research Institute of Epidemiology and Microbiology imeni G. N. Gabrichevskiy

[Abstract] Studies on the isolation of bacterial ribosomes for vaccine preparation have generally utilized ultracentrifugation, and have been complicated by the cosedimentation of endotoxin. The present studies represent an expansion of previous studies on the isolation of ribosomes, and utilized the observation of Expert-Benzancon [Biochimie, 56:77-89, 1974] on the precipitability of bacterial ribosomes by polyethylene glycol (PEG). In the current modification, ultrasonically disrupted *Shigella sonnei* lysates were clarified by centrifugation, and subsequently subjected to two successive precipitations with PEG. Initial precipitation with 10% PEG resulted in a ribosome preparation contaminated with significant quantities of endotoxin, while the second precipitation with 5% PEG resulted in selective precipitation of the ribosomes with 90% of the endotoxin remaining in the supernatant. Ultrasedimentation, UV absorption, and electron micrography of the ribosomal preparation yielded data indicating good tolerance of the PEG-treatment by the ribosomes. The relative simplicity of this method and the higher ribosome yields suggest that the method can be used for preparative purposes. Figures 4; references 14: 4 Russian, 10 Western.
[1529-12172]

STIMULATION OF ANTIBACTERIAL IMMUNITY IN EXPERIMENTAL MOUSE SALMONELLOSIS BY SEA CUCUMBER TRITERPENE GLYCOSIDES

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 5, May 84 (manuscript received 1 Jul 83) pp 55-58

SEDOV, A. M., YELKINA, S. I., SERGEYEV, V. V., KALINA, N. G., SAKANDELIDZE, O. G., BATRAKOV, S. G. and GIRSHOVICH, Ye. S., Central Scientific Research Institute of Vaccines and Sera imeni I. I. Mechnikov, Moscow

[Abstract] Experimental infections with *Salmonella typhimurium* 415 in inbred and outbred mice were used to evaluate the immunenhancing properties of triterpene glycosides (cucumariosides) isolated from sea cucumbers (*Cucumaria japonica*). Pretreatment of (CBA x C57BL-6)_F₁ mice with 0.4-40.0 µg of the glycosides 14 days prior to intraperitoneal infection with *S. typhimurium* 415 (10⁴ cells) resulted in negligible mortality, while 100% mortality was evident in control mice by day 21 after the infection. Intraperitoneal administration of 0.001 µg of the triterpene glycosides to outbred mice, followed in 14 days by an intraperitoneal challenge with 10³ *S. typhimurium* 415 cells, resulted in elimination of the bacteria from the organs and tissues in 21 days, accompanied by enhanced phagocytic activity of the peritoneal macrophages. In control mice a 40% mortality figure prevailed. These observations indicate that the triterpene glycosides isolated from the sea cucumber enhance natural immunity via activation of phagocytic activity. Figures 4; references 12: 5 Russian, 7 Western.
[1529-12172]

UDC 579.842.11:579.61

CERTAIN PROPERTIES OF *ESCHERICHIA COLI* α-HEMOLYSIN

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 5, May 84 (manuscript received 12 Apr 83) pp 44-48

FAVOROV, V. V., SPRYGIN, V. G., ATRASHOK, R. I., ABRAMOV, A. K. and KHAVILOV, A. I., Institute of Marine Biology, Far Eastern Scientific Center, USSR Academy of Sciences, Vladivostok

[Abstract] In order to further define and characterize *E. coli* α-hemolysin, the effects of various chemicals on the hemolytic activity of the hemolysin and its enzymatic activity were investigated using cultures obtained from rats with stool-induced peritonitis. Determination of α-hemolysin activity against human erythrocytes showed that reagents reacting with protein SH groups (α-ethyl maleimide, p-chloromercuribenzoate, dithioglycolic acid) and hydrogen peroxide had virtually no effect on hemolytic activity. However, reducing agents (2-mercaptoethanol, ascorbate) inhibited hemolysis, while cholesterol in a concentration of 4.3 x 10⁻⁶ M reduced hemolysis by 50%. In

addition, the α -hemolysin preparations were shown to lack phospholipase A activity. Thermodynamic evaluation of the hemolytic reaction showed an energy of activation of $13,800 \pm 400$ cal/mole for the lag phase, and $10,600 \pm 100$ cal/mole for actual lysis, values significantly lower than those reported for O-labile bacterial hemolysins. Figures 2; references 12: 2 Russian, 10 Western.
[1529-12172]

UDC 615.31.1.546:13

QUANTITATIVE SPECTROPHOTOMETRIC DETERMINATION OF ISONITROSINE

Kiev FARMATSEVITYCHNYY ZHURNAL in Ukrainian No 2, Mar-Apr 84
(manuscript received 29 Sep 83) pp 34-37

TROKHYMCHUK, V. V. and RYABYKH, L. D., Military Medical Academy imeni S. M. Kirov, Leningrad

[Abstract] Isonitrosine (1-dimethylamino-2-isonitrosobutanone-3·HCl) is generally determined by titration in nonaqueous solvents, a method which is time consuming, difficult and relatively insensitive. In order to devise a more rapid spectrophotometric method, UV absorption spectra of isonitrosine were obtained in 0.1 M HCl and 0.1 M NaOH, which revealed absorption maxima at 227 and 277 nm, respectively. Since decomposition of isonitrosine was at a minimum in 0.1 M HCl, and because the products of its decomposition do not absorb in the UV range, all further determinations were conducted in 0.1 M HCl. Using the Lambert-Beer law and a specific extinction coefficient of 572.92, pharmaceutical samples of isonitrosine were analyzed by UV spectrophotometry with a relative error of 0.35-2.69%. Figures 2; references 3 (Russian).
[1518-12172]

UDC 547.556.9:577.15/.17

SYNTHESIS AND BIOLOGICAL ACTIVITIES OF ARYL-(HETERYL-)HYDROZONE DERIVATIVES OF ARENESULFOHYDRAZIDE ACID SUCCINATE

Kiev FARMATSEVITYCHNYY ZHURNAL in Ukrainian No 2, Mar-Apr 84
(manuscript received 16 Dec 83) pp 64-65

CHERNYKH, V. P., GRITSENKO, I. S., ZAKHAROVA, T. I., CHUBENKO, V. O. and KHOLUPYAK, I. Yu., Kharkov State Pharmaceutical Institute

[Abstract] Thirteen aryl-(heteryl-)hydrazones of arenesulfohydrazide succinates were synthesized by methods previously described [Bryzyts'ka, AM, et al., Farmats. Zh., No 5: 65-66, 1983]. The products were either colorless or colored crystalline substances with poor solubility in water and were further characterized in terms of IR spectra and pKa determinations. All

derivatives possessed marked hypoglycemic and diuretic properties which were, however, less pronounced than that of the clinically-employed butamide and hypothiazide. Certain of the products also possessed antibacterial and fungicidal properties. References 3: 1 Ukrainian, 2 Russian.
[1518-12172]

UDC 547.962

CALORIMETRIC STUDIES OF THERMAL TOXIN DENATURATION

Moscow MOLEKULYARNAYA BIOLOGIYA in Russian Vol 18, No 3, Mar-Jun 84
(manuscript received 15 Apr 83) pp 786-791

KHECHINASHVILI, N. N. and TSETLIN, V. I., Institute of Biological Physics, USSR Academy of Sciences, Pushchino, Moscow Oblast; Institute of Bioorganic Chemistry imeni M. M. Shemyakin, USSR Academy of Sciences, Moscow

[Abstract] The course of thermal denaturation of cytotoxin I and neurotoxins I and II (CT-I, NT-I, NT-II), isolated from the venom of the Central Asian cobra *Naja naja oxiana*, was evaluated in terms of calorimetric data to determine the thermodynamic parameters reflecting the transition from the native to the denatured state of these low MW ($< 10,000$) peptides. Differences in the heat absorption peaks of CT-I, NT-I and NT-II under otherwise identical experimental conditions pointed to differences in thermal stability. The greater thermal stability of NT-II than of CT-I and NT-I was indicated by the fact that the maximum transition temperature for NT-II was almost 20°C greater than for the other two toxins. The enthalpy of denaturation, ΔH_d , was found to increase proportionately to the temperature of transition from native to denatured state, while the partial heat capacity, ΔC_p , increased linearly with temperature until denaturation. The ΔC_p for each peptide molecule was constant and independent of experimental conditions, and calculated at 0.26 ± 0.02 J/K/gm for NT-II and CT-I, and 0.32 J/K/gm for NT-I. Thermal denaturation at 110°C was ascribed to the enthalpy of dissolution of intramolecular bonds and of vander-Waals contacts between nonpolar groups. Figures 5; references 31: 4 Russian, 27 Western.
[1536-12172]

UDC 577.112:612.124.0.7.1:591.145.3-812

NEW LOW MOLECULAR WEIGHT PROTEIN EFFECTOR OF HUMAN COMPLEMENT FROM VENOM OF CENTRAL ASIAN COBRA NAJA NAJA OXIANA

Moscow BIOORGANICHESKAYA KHIMIYA in Russian Vol 10, No 3, Mar 84
(manuscript received 19 Sep 83) pp 323-332

KOZLOV, L. V., SOLYAKOV, L. S. and ZINCHENKO, A. A., Institute of Bioorganic Chemistry imeni M. M. Shemyakin, USSR Academy of Sciences, Moscow

[Abstract] Using chromatography on DEAE sepharose Cl-6B, cation exchanger CM-sepharose Cl-6b and gel filtration on sephacryl S-200, the venom of the

central Asian cobra *Naja naja oxiana* was separated into six fractions with anticomplement activity. The three acidic fractions, CFA-I, CFA-IIa and CFA-IIb, had molecular weights of 61,000, 5000 and 3000, respectively; the three alkaline fractions, CFB-I, CFB-II and CFB-III, had molecular weights of 54,000, 9000 and 7000. Inhibition of the classical complement activation pathway ranged from 3% to 88% for the five factors determined. CFA-I, CFA-IIa and CFB-I inhibited the alternative pathway at levels of 18-21%. CFB-II had no effect on the alternative pathway and CFB-III activated it. The data demonstrate that *N. n. oxiana* venom differs from that of *N. n. naja* and *N. n. haje*. It was observed that CFB-III inactivates human serum component C-4 and that this is the mechanism of its inhibition of the classical pathway. In the alternative pathway, CFB-III converts component C-3 to a C-3b like form, producing a soluble C-3 convertase. The amino acid sequence at the N-terminal of CFB-III (9 of 12 residues determined) corresponds to that of the cytotoxin II previously reported. Molecular weights and LD₅₀'s also agrees. Figures 9; references 19: 6 Russian, 13 Western.
[1521-12126]

UDC 616.98:578.833.27]-085.277.3:547.94:982.937

ACTIVATING EFFECT OF ADRENALIN, PREDNISOLONE AND VINCRIStINE AT REMOTE PERIODS OF TICK-BORNE ENCEPHALITIS PERSISTENCE

Moscow VOPROSY VIROSOLOGII in Russian Vol 29, No 1, Jan-Feb 84
(manuscript received 11 Mar 83) pp 103-108

FROLOVA, T. V. and POGODINA, V. V., Institute of Poliomyelitis and Virus Encephalites, USSR Academy of Medical Sciences, Moscow

[Abstract] Syrian hamsters (4-5 weeks old, weight 60-70 g) were infected subcutaneously with 0.3 ml suspensions of mouse brain containing B-383 and Vasilchenko strains of tick-borne encephalitis virus to determine the activating effects of adrenalin, prednisolone and vincristine at remote periods of tick-borne encephalitis infection with one, two or three administrations of the drugs 250-270 days after inoculation with the virus. The drugs had considerable effect on the persistent tick-borne encephalitis virus as shown by isolation of virulent and slightly-virulent strains of tick-borne encephalitis virus from organs of animals given the drugs but not from organs of control animals. Adrenalin produced the least activating effect while vincristine produced the greatest effect. Tick-borne encephalitis persisted longer in the brain and spleen than in the liver. A possible mechanism of the activating effect of the drugs is immunodepression. References 20: 15 Russian, 5 Western.
[1530-2791]

DRUGS CONTAINING FLUORINE

Kiev FIZIOLOGICHESKI AKTIVNYE VESHCHESTVA in Russian No 14, 1982
(manuscript received 22 Apr 81) pp 3-22

FIALKOV, Yu. A. and YAGUPOL'SKIY, L. M., Institute of Organic Chemistry,
Ukrainian SSR Academy of Sciences

[Abstract] A review article examines published work on the use of fluorine compounds in drugs. The 28% increase in the number of fluorine-containing drugs in use over the period 1971-1978 results from the increased range of fluorine-modified substances and the low toxicity and absence of side effects in many of these drugs. Significant data have now been accumulated on the effect of fluorine substitution of hydrogen atoms in organic compounds and their physicochemical and biological properties, and this has enabled the formulation of semi-empirical laws that aid in the directed synthesis of useful drugs. The general areas covered in the article include inhalation anesthetics and related substances (halothane, teflurane, and the freons); fluorinated steroids (triamcinolone and its derivatives); nonsteroid anti-inflammatory substances (derivatives of salicylic acid, N-phenylanthranilic acid and its heterocyclic analogue, ketones of the aliphatic and aromatic series, condensed carbocyclic and heterocyclic systems and others); anti-eoplastics (antimetabolites, alkylating agents, steroid hormones and their synthetic analogues, with special reference to 5-fluorouracil); and psychotropics (the phenothiazine series). The research history, chemistry, pharmacokinetics and clinical use of these groups of drugs are discussed at length. Extensive use is made by the authors of structural formulas of compounds of interest. References 107: 33 Russian, 74 Western.
[9642-1558]

UDC 547.468-547.466-615-771

SYNTHESIS AND ANTIBLASTIC PROPERTIES OF AMIDOPHOSPHORIC ACID DERIVATIVES

Kiev FIZIOLOGICHESKI AKTIVNYE VESHCHESTVA in Russian No 14, 1982
(manuscript received 10 Feb 81) pp 27-31

LOSEVA, I. M., GUBNITSKAYA, Ye. S., SEMASHKO, Z. T. and PARKHOMENKO, V. S.,
Institute of Organic Chemistry, Ukrainian SSR Academy of Sciences

[Abstract] New organophosphorus compounds containing a 2-chloroethylamide group on the phosphorus atom were synthesized in the search for improved antiblastics, and their antieoplastic properties studied. Compounds were synthesized through the reaction of the dichloroanhydride of isocyanophosphoric acid with aromatic amines, forming N-dichlorophosphonyl-N'-arylureas (I), followed by the reaction of the anhydrides of (I) with the N-(2-cyanoethyl) of ethyleneimine, resulting in splitting of the ethyleneimine ring and the formation of bi-[N-(2-chloroethyl)-N-(2-cyanoethyl)amido] phosphonyl-N'-aryl ureas (II). The phosphorylated iodide of ethylene ammonia was synthesized

and its antineoplastic properties studied. The antineoplastic properties of the synthesized compounds were tested in two tumor models in rats, namely Guerin's sarcoma and carcinoma 45. Results were unremarkable. It is concluded that the addition of a 2-chloroethylamide group on the phosphorus atom to replace the ethylimide group in N-phosphorylated ureas leads to a sharp decline in activity. Accordingly, these ureas are not of interest as anti-blastics. References 7 (Russian).
[9642-1558]

UDC 547.373 + 272.2

ANTIMICROBIAL ACTIVITY OF PYRAZOLE DERIVATIVES

Kiev FIZIOLOGICHESKI AKTIVNYYE VESHCHESTVA in Russian No 14, 1982
(manuscript received 30 Dec 80) pp 75-77

MAKHSUMOV, A. G., MADIKHANOV, N., DZHURAYEV, A. D., SARYMSAKOV, A. Kh. and ARIPOV, Sh. U., Tashkent Medical Institute; Andizhan Institute of Cotton Growing

[Abstract] As part of the problem of the constant need for new drugs to deal with microorganisms that become drug resistant, new compounds of the pyrazole series were synthesized and their antimicrobial activity studied. Synthesis was done on the basis of cyclization of the propargylic esters of the carboxylic acids with diazomethane at room temperature. The reaction resulted first in the formation of pyrazoleenines (3-(methoxypropionate)-pyrazole, 3-(methoxybutanoyl)-pyrazole, 3-(methoxyhexanoyl)-pyrazole, 3-(methoxyoctanoyl)-pyrazole, 3-(methoxydecanoyl)-pyrazole) which were mostly isomerized into pyrazoles. The antimicrobial activity of the synthesized compounds was tested on Staph. aureus, Bact. pr. vulgaris, Bact. pyoceaneum, Sh. flexneri 2a, Salm. typhimurium and E. coli O_{III}. It was established that the presence of the pyrazole ring in the carboxylic acids enhanced antimicrobial activity. Stronger antimicrobial activity was found in 3-(methoxypropionate)-pyrazole, which slowed growth in all the microorganisms tested. Its action against Sh. flexneri 2a and E. coli O_{III} was particularly high. Reference 1 (Russian).
[9642-1558]

EFFECT OF COCARBOXYLASE AND LIPOIC ACID ON EXCRETORY FUNCTION OF LIVER IN RABBITS EXPOSED TO CARBON TETRACHLORIDE POISONING

Kiev FIZIOLOGICHESKI AKTIVNYYE VESHCHESTVA in Russian No 14, 1982
(manuscript received 2 Jun 80) pp 98-101

VOYTENKO, G. N., MKHITARYAN, L. S. and SKIBA, V. V., Kiev Institute of Advanced Training of Physicians, USSR Ministry of Health

[Abstract] A study was made of the effect of cocarboxylase and lipoic acid on hepatic function in rabbits with carbon tetrachloride poisoning, using the sulfobromophthalein test. After inducing toxic hepatitis by gastric administration of CCl_4 (0.5 ml/kg body weight), the subjects were treated with vitamins (10mg/kg), and cocarboxylase (subcutaneously) and lipoic acid (into the stomach) were then administered separately or together three times daily for three days. The sulfobromophthalein test was made at 3, 5 and 7 days after administration of the CCl_4 . The effect of the cocarboxylase and lipoic acid on the toxic hepatitis was determined from the indexes of the liver enzymes alanine aminotransferase, aspartic aminotransferase and sorbitol dehydrogenase. The level of enzyme activity, particularly sorbitol dehydrogenase, is more sensitive than the sulfobromophthalein test in revealing damage to the hepatic parenchyma, but the sulfobromophthalein test demonstrates better the changes in hepatic function as the liver normalizes following serious impairment. Findings showed that the administration of cocarboxylase and lipoic acid in carbon tetrachloride poisoning in rabbits exerts a marked therapeutic effect on liver function, particularly when they are used together. Figures 1; references 12 (Russian).
[9642-1558]

PHYSIOLOGY

YEREVAN SCIENTISTS' CONFERENCE

Yerevan KOMMUNIST in Russian 1 Jul 84 p 4

[Text] The modern era has been marked by the rapid development of knowledge concerning brain activity. Neurobiology has uncovered remarkable secrets of the living cell and has astonished us with spectacular discoveries. Scientific progress has covered various aspects of the study of cerebral function and its physiochemical and physiological mechanisms. The development and application of fundamentally new procedural approaches in the study of basic problems of cerebral circulation has led to the restructuring of existing theories and developed theoretical plans and systems. Problems of the physiology, vascular pathology and pharmacology of cerebral circulation in light of recent scientific achievements have become an important theme of the first All-Union Conference of Scientists which opened on 21 June in Yerevan. It was opened by E. Gabrielyan, chairman of the organization committee and Armenian SSR Ministry of Health. He stated that over the last ten years, urgency in our country as well as throughout the entire world. The phenomenon of multiple risk factors that are extremely harmful to cerebral circulation, basically created by man himself as a result of production and scientific and technical activity, has turned against him like a biological boomerang. The prevalence and the dramatic outcome of cerebral circulatory disorders, often with total and long-term disability, causes a problem of critical importance, in human as well as in social aspects. This is why the need for expanding and raising the level of scientific research on cardiovascular diseases, including those of the cerebral circulation, is particularly emphasized in the most important party and state documents devoted to all-out development of public health and medical science. The work of the conference will undoubtedly serve as a great stimulus for intensification of research on the study of theoretical and clinical aspects of cerebral circulation. V. Fanardzhyan, vice-president of the Armenian SSR Academy of Sciences addressed the conference participants with words of welcome.

12262

CSO: 1840

ULTRASONIC MONITOR OF PHYSIOLOGICAL PRESSURE RESPONSES

Moscow VECHERNYAYA MOSKVA in Russian 5 Jul 84 p 3

[Unattributed article]

[Text] Scientists of the Institute of Electronics, Belorussian Academy of Sciences have developed an ultrasonic diagnostic instrument for monitoring the state of health of people in various occupations, especially those who work in conditions of frequent and marked fluctuations of atmospheric pressure--pilots, submarine crewmen and miners.

It permits a rapid and accurate monitoring of the auditory tubes in both normal subjects and those in need of medical care. The instrument is easy to use, compact and light-weight.

FTD/SNAP
CSO: 1840/753

CONFERENCE OF FEDERATION OF EUROPEAN BIOCHEMICAL SOCIETIES

Moscow IZVESTIYA In Russian 29 Jun 84 p 2

MANUCHAROVA, Ye. and KHRUMCHENKO, M., special correspondents, Izvestiya

[Abstract] The molecular mechanism operating during signaling of physical and mental pain was a major subject of discussion at this the 16th conference of the tital federation. Emphasis was placed on discussion of the structure and operation of neuropeptides as the substance carrying signals of danger to the body in the form of pain and description of the complex role of substance P in carrying pain sensations. Discussions of biorhythms involved arguments and differences of opinion among conference participants. Many ideas were presented in exhibits revealing the ideas and theses of young scientists; one of these was directly related to biorhythms. It portrayed differences in vital functions and reproduction of a fungus in a sealed container on east to west flights, west to east flights and space flights in response to electromagnetic lines of force of the earth. Aspects of homeostasis of the multicellular organism were also discussed.
[766-2791]

HIGH ALTITUDE PHYSIOLOGY RESEARCH AT KIRGHIZ INSTITUTE

Frunze SOVETSKAYA KIRGIZIYA in Russian 18 May 84 p 3

DANIYAROV, S., corresponding member of the Kirghiz Academy of Sciences, president of the Kirghiz State Medical Institute

[Abstract] The author discusses directions and results of research of high-elevation adaptation and therapy at the Kirghiz State Medical Institute. Both experimentation with living organisms and modeling methods are being used in this work. The author observes that an analysis of the U.S. medical bibliography journal "Index Medicus" shows that Kirghiz scientists hold a leading position in this field. They are the authors of more than 30 percent of all published materials on high-elevation medicine and 60 percent of the materials on high-elevation cardiology. The staff of the Kirghiz State Medical Institute includes 42 doctors of sciences and more than 260 candidates of sciences. The names of leading participants in some of its current projects are mentioned.

M. Mirrakhimov, corresponding member of the USSR Academy of Medical Sciences and full member of the Kirghiz Academy of Sciences, is directing studies of the physiology and pathology of organisms at high elevations. The institute's chair of normal physiology and sectors of its central scientific research laboratory are studying change in the functions of the circulatory and respiratory systems and the interaction and regulation of these functions in high-elevation conditions. In connection with these studies, one group has developed and introduced a computer-based scientific research complex which allows large amounts of information to be recorded at a single time, processed and stored during observations of humans and experimental animals. It is noted that B. S. Mambetaliyev was awarded a doctoral degree in 1983 for original studies of the adaptation of newcomers to high-elevation locales in the process of performing their jobs. Valuable works and recommendations reportedly have been produced by associates of the chair of nervous diseases, which is headed by Professor A. M. Murzaliyev, corresponding member of the Kirghiz academy, and by personnel of the chair of propaedeutic therapy, which is headed by Professor I. T. Kalyuzhnyy. They are studying multiple sclerosis and features of the occurrence and course of endocrine diseases in high-elevation conditions, respectively.

FTD/SNAP
CSO: 1840/752

ADAPTATION RESEARCH FEATURED AT PHYSIOLOGY FORECASTING SYMPOSIUM

Frunze SOVETSKAYA KIRGIZIYA in Russian 15 May 84 p 3

[Abstract] The article is an interview with Candidate of Medical Sciences Arkadiy Leonovich Maksimov, senior science associate of the Kirghiz Academy of Sciences' Institute of High-Elevation Physiology and Experimental Pathology, on the eve of the opening of an All-Union symposium on forecasting in applied physiology. It was the second time that a symposium on this topic was held in the city of Frunze. The symposium was sponsored by the Kirghiz academy and the scientific council on human physiology of the USSR Academy of Sciences and Academy of Medical Sciences. An editorial preface to this article identifies Maksimov as the symposium's executive secretary. His institute was in charge of organizing the symposium. Scheduled to take part in it were more than 300 delegates from 45 citires, including leading scientists who are studying effects of extreme natural factors on humans, as well as specialists in aerospace medicine and work and sports physiology. Commenting on the reasons for holding the symposium and on its discussion topics, Maksimov explains that studies of severe natural conditions' effects on humans are being pursued more and more intensively in the USSR, in connection with the exploration of space and deep levels of the world's oceans, and the economic development of polar regions and mountaineous areas. In the Kirghiz republic, work is in progress on forecasting effects of high-elevation conditions on humans, for example. Maksimov mentions the names of some of the scientists

who were to take part in the symposium, including A. L. Matusov, head of the polar medicine department of the Arctic and Antarctic Institute and one of the Soviet representatives in an international organization which is doing research in Antarctica. Maksimov himself was scheduled to present a paper on human adaptation in high-elevation conditions of Antarctica. He has worked there before, spending a winter at the "Vostok" station, and he is planning to take part in the upcoming 30th Soviet Antarctic Expedition in 1985.

FTD/SNAP

CSO: 1840/752

PUBLIC HEALTH

BULGARIAN PUBLIC HEALTH PROFESSIONALS VISIT UKRAINE

Kiev RADYANS'KA UKRAYINA in Ukrainian 7 Jun 84 p 3

[RATAU wire service article: "Objective of Cooperation -- Man's Health"]

[Text] The Bulgarian Medical Science Days held in Moscow and Kiev were an important contribution toward further broadening of contacts between medical scientists of the USSR and the People's Republic of Bulgaria. A delegation of scientists from this brother country, led by First Deputy Minister of Public Health and Chairman of the Presidium of the Bulgarian Medical Academy A. Maleev, took part in the festivities.

The guests visited the UkSSR Ministry of Health. Minister of Health A. Yu. Romanenko briefed them on the principal directions of development of the health care system in this republic and on participation by Ukrainian medical scientific research establishments in Soviet-Bulgarian cooperation. The head of the delegation presented information on health care achievements in Bulgaria in 40 years of socialist development. It was emphasized that unification of the efforts of scientists and specialists from both brother countries in the field of health protection and care serves the humanitarian goals of strengthening people's health. Under socialism this is a paramount concern of society and the state.

USSR Deputy Minister of Health Yu. F. Isakov and Bulgarian Consul General in Kiev O. Tonev took part in the discussion.

The members of the delegation became acquainted with the activities of the All-Union Scientific Research Institute of Hygiene and Toxicology of Pesticides, Polymers and Plastics of the USSR Ministry of Health, the USSR Academy of Medical Sciences Institute of Gerontology, the Kiev Scientific Research Institute of Labor Hygiene and Occupational Diseases, and visited a number of other institutes. Bulgarian scientists presented papers before their Kiev colleagues. They reported on new research in the field of medicine and biology and discussed problems of hygiene and occupational diseases, surgery, and other important areas in which they are working today.

3024

CSO: 1840/727

BASIC DIRECTIONS IN DEVELOPMENT OF HEALTH CARE AND MEDICAL SCIENCES IN
UKRAINIAN SSR

Kiev VRACHEBNOYE DELO in Russian No 6, Jun 84 pp 1-7

[Article by A. Ye. Romanenko, UkSSR minister of health]

[Text] The decisions of the February and April (1984) Plenums of the CPSU Central Committee and the speeches made by comrade K.U. Chernenko, general secretary of the CPSU Central Committee and chairman of the Presidium of the USSR Supreme Soviet, are full of concern for the people's well-being. At the plenums emphasis was placed once again on the need to coordinate the resolution of the goals that have been set more closely with improvement in personnel policies, working and living conditions, and the health care provided for the workers. These issues are the focus of constant attention on the part of the republic's party and soviet organs.

The course for improving health services is tied inseparably to strengthening the material and technical base of health care. During the first three years of the 11th Five-Year Plan approximately 475.4 million rubles have been spent for this purpose, 162 million rubles of which came from the funds of industrial enterprises and kolkhozes. During this time hospitals with a total of 37,000 beds and polyclinics capable of handling 75,000 visits were put into operation. Hospitals with 1000 beds and a number of different departments were opened in Odessa and Lvov. Other projects put into operation include 26 children's hospitals and polyclinics, 34 maternity homes and obstetric-gynecological departments.

Capital investments during the current five-year plan are aimed primarily at developing a network of major hospitals, children's institutions, maternity homes, and modern, well-equipped polyclinics. A great deal of attention is being given to developing the material base of rural medical institutions.

In the Ukraine the level of hospital services and medical personnel available to the population is high: for every 10,000 residents there are 130 hospital beds and 36 physicians. This means that the quantitative indicators of the medical care provided to the republic's population in terms of basic parameters have approached, and in a number of oblasts exceeded, the norms set for the UkSSR for 1985.

We will summarize the results of the activity of medical institutions during the first three years of the 11th Five-Year Plan taking into account an especially important condition--the ability of the republic's health care system to make the transition to a new stage: providing preventive care and treatment to the entire population. Improving medical services is tied primarily to the need to improve in every way possible the out-patient and polyclinic services that are called on to provide expanded preventive care, early detection of disease, and treatment for the overwhelming majority of patients on an out-patient basis.

Success in solving this problem is determined by the sound foundation and specific goals of planning measures to strengthen and develop the health care system, by the wise use of manpower and funds, and the level and effectiveness of control over the implementation of the measures that have been outlined.

It is completely obvious that the application of experience that has been gained in various areas in organizing preventive examinations and treatment on an out-patient basis is possible only through the creation of a strong material and technical base for polyclinics, providing them with diagnostic and therapeutic equipment, and staffing them with the required specialists.

During the first three years of the current five-year plan many new polyclinics have been built, for example, in Voroshilovgrad, Donetsk, Dnepropetrovsk, Ivano-Frankovsk, Crimean, Lvov, Kharkov, and Cherkassy oblasts, and in Kiev. In these oblasts active use is made of financing from industrial enterprises and kolkhozes for construction along with state capital investments for strengthening the material and technical base of polyclinics.

The planned health center system calls for an increase in the share of work done by out-patient and polyclinic institutions, in connection with which oblast health departments must complete in as short a time as possible a schedule for their operation that meets the interests of industrial enterprises and workers; the introduction of annual preventive examinations and expansion of treatment measures should not bring about an increase in lost work time due to visits to medical institutions.

During the current five-year plan extended operating schedules have been introduced at polyclinics that include evening hours and Saturdays. The majority of medical institutions provide access to medical care seven days a week. When changing the operating schedule of polyclinics it is important not to reduce the diagnostic and specialized medical care available on Saturdays and on days preceding holidays and not to limit the number of patients received and the operation of the medical consulting commission on Saturdays.

District therapeutic physicians play an important role in implementing universal preventive health care and treatment. In this connection regional medical sections will be broken up into smaller units during the current five-year plan. Currently one district physician serves 1870 adults, and one pediatrician cares for 801 children. Therefore, in order to reach the norm that has been set (1700 people per uchastok physician), another 1000 positions will be created and staffed with uchastok physicians; this is a goal that can be met. Here it is important that the proper conditions be created at

polyclinics for the uchastok physicians: transportation for visiting patients at home should be provided, special benefits should be provided for attending institutes to improve one's skills and for going through the certification process; these measures would do a great deal to keep specialists on the job.

Over the past three years alone the UkSSR Ministry of Health has sent 3500 physicians to work in uchastok therapeutic clinics. The goal is to create a priority role for these physicians in the practical work being done by administrators at all levels.

We are devoting special attention to strengthening a very important link in rural health care--out-patient clinics and uchastok hospitals. A total of 4500 young specialists have been sent to work in these institutions over the past 3 years. By the end of 1986, 1198 out-patient clinics will be staffed with a general physician, a pediatrician, and a stomatologist, which will make it possible to bring medical care closer to the rural population.

Today the indicator of availability of medical care for rural residents in oblasts such as Ivano-Frankovsk, Crimean, and Cherkassy, is 8.4 visits to a physician per resident.

In the preliminary work for implementing the mass health center system, which includes creating personal card files and then filling medical prescriptions on an out-patient basis in the process of preventive examinations, the role of physician's assistant-and-midwife centers increases. In Volynsk, Poltava, Kharkov, and Cherkassy oblasts there is intensive construction of model buildings for these institutions and they are being equipped with medical devices, instruments, and refrigerators.

Thus, in order to expand the volume of diagnostic and treatment work on an out-patient basis, taking into account the introduction of annual preventive examinations for the entire population, the following steps must be taken to strengthen out-patient and polyclinic services:

--Develop and coordinate at the appropriate stages specific plans for strengthening the material and technical base of polyclinics of city and central rayon hospitals in the 12th Five-Year Plan, using state capital investments and other sources of financing. Actively draw in funds from industrial enterprises and economic organizations for this purpose;

--Take immediate measures to improve the operation of polyclinics during evening hours and on Saturdays. Work with managers of industrial enterprises, organizations, and educational institutions to develop a system for mass preventive examinations, using primarily time that the individuals are not working or studying;

--Work actively to organize preventive care and rehabilitation departments in polyclinics. Introduce in 1984 the experience of the Kalinino hospital in providing preventive care and treatment to the population at 2-3 polyclinics and central rayon hospitals in each oblast;

--Assign the chief specialists at oblast health departments, together with organizational and methodological departments of oblast hospitals, the task of studying the contingents at polyclinics and the recovery of patients receiving care, primarily children, adolescents, and the working population;

--Prepare and submit for consideration by the oblast soviet executive committees proposals to obtain kolkhoz funds for construction of uchastok out-patient clinics and physician's assistant-and-midwife centers, as well as for housing for medical personnel;

--In 1984-1985 create positions for pediatricians and stomatologists at all uchastok hospitals and out-patient clinics where these positions are provided for in the norms, and fill these positions using graduates from medical VUZes.

Putting modern hospitals and medical departments into operation every year has substantially expanded the possibilities for organizing hospital treatment, which is an integral and very important part of the complex problem of meeting the population's demand for top medical care. In the last three years alone, using all sources of financing hospitals and maternity homes with a total of 37,600 beds have been built. The average capacity of oblast hospitals exceeded 1000 beds (1002), and that of central rayon hospitals reached 330 beds. This republic is one of the leaders in the number of hospital beds provided to the population, standing behind the RSFSR, the Kazakh SSR, and the Latvian SSR; the level of hospitalization in cities and rural areas was 25 per 100 residents (in cities the number was 25.5 and in rural areas the number was 25.9), while in Dnepropetrovsk, Zaporozhye, Kirovograd, Crimean, and Nikolayev oblasts almost every third rural resident receives hospital care. These quantitative indicators show that with the current incidence of illness and under the conditions of proper selection and preparation of patients for hospitalization, and rational utilization of hospital beds, the population's demand for hospital care both in emergency and planned situations can and should be met completely.

However, there are still some shortcomings in the organization of the hospitals' activities, which lead to an unwarranted decline in the availability of hospital care for patients who come on a planned basis, including those from preventive health care centers; this has a negative effect on the volume and effectiveness of hospital treatment.

An analysis of the operation of health care institutions conducted in 1983 made it possible to identify two basic groups of reasons that create to a certain extent artificial barriers to problem-free hospitalization. The first and primary group of reasons includes incomplete diagnostic studies and treatment on an out-patient basis and an absence of proper control over the annual therapeutic measures performed by polyclinics for the out-patients. Planned hospitalization is being replaced to a significant extent by emergency hospitalization and hospitalization based on the turnover rate.

The second group of reasons consists of inadequate management on the part of chief physicians, their assistants, chief specialists, and the organizational and methodological departments of oblast hospitals over the activity of hospitals and their separate departments. There should be an increase in the level of methodological control on the part of chief specialists at oblast

health departments and oblast hospitals: there should be a periodic analysis and expert evaluation of the work being done at specialized hospitals; and treatment schedules and techniques should be worked out for the same type of departments at various hospitals, which in the final analysis will determine the length of the patients' average hospital stay for each hospital.

In recent years a positive trend has been achieved in the republic's basic indicators of the quality of treatment at hospitals; there has been an increase in the effectiveness of treatment provided to cardiology, pulmonary, and other patients; indications for surgical treatment have expanded; and there has been a decline in post-operative fatalities with planned and emergency surgical intervention.

Taking into account the coming increase in the work performed by hospitals as a result of the new universal health care system, the following should be done: 1) Implementation of constant practical control over the utilization of hospital beds; 2) Planned hospitalization of patients only after preliminary examination on an out-patient basis; 3) Expert evaluation of patients who have undergone planned hospitalization in city and rayon hospitals, and preparation of proposals for expanding treatment on an out-patient basis.

In connection with the tasks facing the republic's medical personnel that involve expanding the prevention of illnesses and complications that cause a loss in working ability, the problem of protecting the health of women and children takes on special importance. Data on the significant number of 15-year old young men and women who have not been treated successfully and have been referred by physicians at children's polyclinics to physicians specializing in adolescents indicates that there is an urgent need to improve constant medical observation of children, starting from the moment they are born and on into pre-school care and school education.

The overwhelming majority of administrators in the republic give priority to maternity and children's services when there are questions of construction, providing equipment, and staffing. Persistent, purposeful work done by oblast and city health departments made it possible to achieve positive results in medical services for pregnant women, women in childbirth, and newborns. Every year there is a drop in the mortality rate among mothers and infants, and there is a decrease in the mortality rate among children at an early age that is due to respiratory illness, and infections and parasitic diseases. A stable decline in these indicators has been achieved in Vinnitsa, Kiev, Ivano-Frankovsk, Lvov, Chernigov, and other oblasts. The experience in these oblasts and various model institutions indicates that there are real opportunities for reducing the maternal and infant mortality rate. A study of the health status of women and children showed that at the present stage gynecological care centers should play the primary role in protecting the health of future mothers and in reducing infant mortality; these centers should not only provide complete supervision of pregnant women, they should also carry out the necessary measures for preventing late toxemia and complications of various extragenital diseases, with the aim of preventing premature births and stillbirths, as well as problems such as maternal death. The failure to meet some of these requirements at some gynecological care centers can sometimes result in the death of the mother.

An analysis of the incidence of disease and mortality among infants during the first year of life makes it possible to conclude that the main reserves for reducing the incidence of disease consist of improving the quality of medical care in the perinatal period.

Taking into account the transformations that are taking place in our country in school instruction, the Ministry of Health has outlined a number of measures for improving medical supervision and improving the quality of medical treatment provided to pre-school children and schoolchildren. The necessary prerequisites have already been implemented: pediatric departments have already been broken down into smaller units and they have been staffed with pediatricians. Preventive examinations annually include over 99.6 percent of all schoolchildren.

Pediatric services and medical-physical fitness centers are still not devoting enough attention to improving children's health, the result of which is that risk factors develop at this age for the spread of chronic diseases among adolescents and adults. Especially alarming is the increase in obesity that is the result of an energy imbalance--an improper excess food intake and increasing sedentary behavior. Obesity is a serious social problem, since it leads to early sclerosis, hypertension, and diabetes mellitus, which can create a hereditary predisposition for developing metabolic disturbances in future generations. Under these conditions it is very important to spread propaganda on proper eating habits, physical fitness, and sports, especially among children. The introduction of special sets of physical exercises at a number of pre-schools decreased the incidence of illness among children to one-fourth the original level.

When planning and implementing measures to provide preventive health care and treatment to the population, it is necessary to carry out a number of measures to improve the medical services for women and children:

--An in-depth analysis should be made of the causes of childbirth fatalities that include both the mother and infant at obstetric hospitals and children's hospitals; on the basis of these data measures should be worked out to eliminate shortcomings in the work done by gynecological care centers and obstetric and children's hospitals; steps should be taken to organize individual training of obstetrician-gynecologists and pediatricians and to implement a certification process for them;

--Seminars and practical instruction should be given on issues in intensive care, including infusion therapy, at obstetric and children's hospitals for the chiefs of these departments; staff members of pediatrics, obstetrics, and gynecology faculties should serve as lecturers at meetings of this sort;

--Specific recommendations should be developed for improving the quality of preventive care, diagnosis, and medical care at obstetric hospitals in the case of childbirth trauma, asphyxiation, and pneumonia in newborns.

Success in protecting and improving the health of the population depends to a great extent on the status of scientific research on the most pressing problems

in practical health care and on the introduction of contemporary methods of prevention, diagnosis, and treatment at hospitals and polyclinics. A great deal of work has been done in the republic to raise the level of medical sciences. Scientific research institutes involved in clinical and experimental surgery, neurosurgery, cardiology, cardiovascular surgery, and other disciplines, are working fruitfully in this direction.

In 1983 the Kiev Pediatrics, Obstetrics, and Gynecology Scientific Research Institute imeni Hero of the Soviet Union P. M. Buyko, together with the Kiev Medical Institute, completed work on the development and practical application of recommendations for the prevention and treatment of premature births, and the treatment of fetal hypoxia in pregnant women with complicated obstetric histories, which are aimed at reducing maternal and perinatal mortality. According to clinical data implementation of these recommendations makes it possible to reduce by 40 percent the cases of asphyxiation in newborns and to reduce perinatal mortality by 13-15 percent.

The introduction of a preventive care and treatment system for patients with pulmonary diseases, which was proposed by the Kiev Tuberculosis, Pulmonology, and Thoracic Surgery Scientific Research Institute, at 250 institutions has contributed to a significant reduction (up to 30 percent) in the duration of temporary incapacitation and primary disability due to nonspecific diseases of the respiratory organs.

Associates of the Kiev Cardiology Institute imeni N. D. Strazhesko have made a tangible contribution to the development of measures to make further reductions in mortality due to myocardial infarction. There has been a stabilization of the incidence of cardiovascular diseases in the republic and in the mortality due to these diseases.

However, an analysis of the incidence of illness with temporary incapacitation, primary disability, and mortality among the population, together with the slow rate at which these indicators are declining, indicates that not enough scientific research is being done on the most urgent topics and that the system used to incorporate research into practice is not adequate.

The UkSSR Ministry of Health is taking the necessary measures to incorporate scientific achievements into practice. The considerable scientific potential and the growing material, technical, and manpower possibilities in practical health care make it possible to make greater demands on the directors of scientific collectives and health care organs to exert a more active influence on this process. It must be pointed out that the completion of scientific work, the defense of dissertations and preparation of methodological recommendations represent just the initial phase of incorporation; an effect from the application of scientific research results can be achieved only when clinical scientists and directors of health care organs and institutions work together. A formalistic approach to issues of incorporation is leading to an unwarranted decline in the number of medical institutions which use contemporary methods of diagnosis and treatment of patients with malignant neoplasms, respiratory illnesses, eye diseases, and other disorders.

Comrade V. V. Shcherbitskiy, member of the Politburo of the CPSU Central Committee and first secretary of the CPUk Central Committee said: "Today the scale of incorporation and the time required for incorporation represent the central link being given primary emphasis. The extent to which each worker applies himself skillfully and conscientiously to realizing this goal in his assigned area provides the most accurate and complete testimonial of his labor and political qualities."*

Successful realization of the decisions of the 26th CPSU Congress regarding the preservation and extension of the creative longevity of the Soviet people is tied to the need to improve the administration of health care at all levels, and to proper personnel policies. The Leninist demand to ensure the strictest discipline and personal responsibility for the work being done takes on special importance during a period in which there is a sharp increase in the correlation between final results and the labor contribution of each worker.

"The question of organization and order is a key, fundamental issue for us. There are no two ways about it--any disorderliness or irresponsibility represents more than just material losses for society. They cause serious social and moral damage."** This statement made by comrade K. U. Chernenko, general secretary of the CPSU Central Committee, at the February (1984) Plenum of the CPSU Central Committee should become a criterion for evaluating the activity of all the administrators of health care agencies.

The Ministry of Health has made significant increases in its demands for training and educating medical personnel. There are instances of physicians' treating patients carelessly and these cases are not always subjected to harsh condemnation in the collectives, and the individuals committing these violations are not always made to answer for their actions.

Successful realization of the goals that have been set and that will determine the fulfillment of the five-year plan depends on large-scale creative research and elimination of the obstacles to intensive, fruitful work.

In implementing the decisions of the February and April (1984) Plenums of the CPSU Central Committee, the UkSSR Ministry of Health is taking steps to improve the forms and style of management. Increased demands have been placed on directors of administrations for specific, sound planning of the development of sectors of medical science and practice that are under their jurisdiction, and for implementation of effective control over realization of the goals of the party and government in the area of health care.

*PRAVDA UKRAINY, 3 February 1984

**PRAVDA, 14 February 1984

The party has outlined the basic direction for the development of all sectors of the national economy, at the foundation of which lie profound qualitative changes and decisive intensification. Realization of this direction is a guarantee of success in meeting the goals facing us that involve improving the activity of health care agencies.

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BRIEF

MEDICAL COMPLEX--On the corner of Solidarnost' Prospekt and Kollontay Street, construction has unfolded of a modern medical complex, including a multi-profile hospital with 1100 beds, a maternity home, a psychoneurological institute and other auxiliary wings. They are located in an area of more than 20 hectares at the junction of Veseliy Settlement and the Rzhevki-Porokhovyye rayon. Construction of the main wing, a food block and a laundry is being done by a collective of the Sixth Mobile Mechanized Column of Trust No 5 Glavleningradstroy. Taking into consideration the fact that the project is being built by order of the electorate, the PMK [mobile mechanized column] collective assumed increased responsibilities--to have the nine-story hospital wing ready for the installation of equipment by the third quarter of this year. The finishing work is already being done in this wing, and construction brigades have moved to the management block. The Integrated Brigade of Communist Labor Imeni 26th Parts'yezda, led by V. P. Ivanov, one of the best in the PMK, is working on construction of an underground passageway which will connect the main wing of the hospital with the managerial section. [By N. Kolesnikova] [Text] [Leningrad LENINGRADSKAYA PRAVDA in Russian 13 Jul 84 p 4] 12262

CSO: 1840/759

PROBLEMS IN CONSTRUCTION OF MOSCOW HEALTH-CARE FACILITIES

Moscow MOSKOVSKAYA PRAVDA in Russian 4 Aug 84 p 2

GURO, B., Moscow City Executive Committee Main Administration for Capital Construction

[Abstract] Problems with the construction of health-care facilities in Moscow city are discussed. With only 18 months of the current five-year plan remaining the Moscow construction plan for health-care facilities is already behind schedule to the tune of R5 million. Projects behind schedule include a pediatric clinic on Yalta Street (under general contract to the No 3 Mosstroy Construction Trust), a polyclinic on Kostyakov Street (the No 2 Mossantekhstroy Trust), a pediatric stomatological polyclinic on Skhodnen Street (Nos 5 and 6 Mosstroy trusts), a second unit for a pediatric hospital in Brateyeva, the surgical department in Pervaya Gradsкая, and a tuberculosis dispensary in Nagatina. Reasons for the delays include lack of coordination between construction programs and manpower resources available, entrusting construction to nonspecialist organizations, and changing contractors during construction. Lack of initial preparatory work is also causing delays in construction work: of 17 polyclinics scheduled for completion by the end of this five-year plan, work has been started only on 5. Delays are also being experienced in hospital construction. Because of mismanagement, work has ceased on construction of one hospital on Pistsovaya Street, another on Zagorodnyy Highway, the pediatric section of the No 13 Clinical Hospital imeni Filatov, and an obstetrics facility on Samarkand Boulevard. Solutions suggested for the problems include immediate increases in the capacities of the specialized construction organizations and a radical change in attitudes toward the construction of health-care facilities. The creation of specialized construction brigades is also proposed so that specific experience can be gained in particular types of construction and operations thus improved. No references.
[9642-787]

HUMAN ADAPTATION IN HIGH-MOUNTAINEOUS AREAS

Frunze SOVETSKAYA KIRGIZIYA in Russian 8 Aug 84 p 3

AYDARALIYEV, A., Institute of Physiology and Experimental Pathology of High Mountains, Kirghiz SSR Academy of Sciences

[Abstract] Plans to further develop high-mountainous areas in the Kirghiz SSR are prompting further studies of human high-altitude adaptation. It has

been established that resistance to high-altitude hypoxia is not always stable: human work capacity also depends on the body's "adaptive reserve," which if low can cause problems even at relatively low altitudes (above 1,500 meters). Studies have shown that 12-16% of individuals are unable to adapt to high-altitude conditions. Consideration of data obtained on the effects of cold, heat and hypoxia on the muscular system, and of inadequate water on digestive and water-salt metabolism and total energy has enabled postulation of a general concept on adaptation and the isolation of environmental factors that enhance or lower or retard or accelerate high-altitude adaptation. Mechanisms involved in these processes include functional changes in muscle fiber, reactions at the tissue level, and shifts in neuronal nuclei in the hypothalamic field. Little research has been done on establishing regimes for work and rest at various altitudes, or on when critical levels may be reached. More research is also needed on the physiological cost of performing various operations at high altitudes (elevated energy metabolism, the capacity of the cardiovascular system, respiration and so forth). Preliminary training is important for individuals about to live in high-altitude areas. Training should be stepped in terms of altitude, and it would be advisable to set up intermediate way-stations for adaptation purposes. Work is also being done on ways to accomplish rapid high-altitude adaptation. Most of the high-altitude studies conducted up to now have used young subjects (aged up to 30) but the long-term effects of high-altitude living and adaptation are poorly studied, although it is known that pregnancies and births among newcomers are complicated. Further studies are also needed to establish criteria for the suitability of individuals for various occupations pursued in high-altitude areas. No references.
[788-9642]

PROBLEMS OF MEDICAL STAFFING IN RURAL AREAS

Moscow SEL'SKAYA ZHIZN' in Russian 2 Aug 84 p 2

LIKHONIN, L., head physician, Demyanskiy Central Rayon Hospital, Novgorod Oblast

[Abstract] The problem of physician turnover in rural areas is discussed, with examples given from the Demyanskiy rayon. Only 3 of the 15 junior physicians assigned to Demyanskiy rayon in the past 3 years have remained. Most young physicians leave the area as soon as the period of their initial assignment has ended. Only 1 physician in five overall remains to work in the area. Despite local efforts to encourage young physicians to stay, including the provision of good housing and day-care facilities for children, many prefer to seek positions in the cities. It is conjectured that the high turnover rate results partly from the fact that the departing physicians have trained in urban schools and are unprepared for work in a rural environment. Most of those who do remain come from the physician training establishments in Kalinin, Smolensk and Yaroslav oblasts. Lack of direct help, personal encouragement and advice from senior colleagues is also a contributory factor in the exodus. Suggestions aimed at improving the situation include special concern to create good working and everyday conditions for medical personnel,

enhancement of physicians' prestige among the leadership of the economic and soviet organs, and greater involvement of physicians in the social life of the countryside. Greater care should also be taken to install in junior physicians the qualities of pride and humanism in their profession. Career counseling should also be stepped up for schoolchildren. Greater stress should be laid on the advantages of working in the rural environment, such as the rich practical skills mastered and the opportunities to be creative in applying knowledge. Finally, a call is made for the press to do more in extolling the virtues of medical work in rural areas. No references.
[789-9646]

UDC 616.98:578.532.1]-07:612.017.]-084.4

DYNAMICS OF POPULATION IMMUNITY TO INFLUENZA VIRUSES A AND B AFTER INTRODUCTION OF COMPLEX SYSTEM OF INFLUENZA CONTROL IN CITY

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 3
Mar 84 (manuscript received 22 Feb 83) pp 103-106

KUSTIKOVA, Yu. G. and GAGARINOVA, V. M., All-Union Scientific Research Institute of Influenza, USSR Ministry of Health, Leningrad

[Abstract] Effect of a complex of measures for controlling influenza in Severodvinsk by ensuring population immunity to influenza virus strains A and B was described and discussed. Control measures included mass vaccination programs, study of the health and epidemic situation, emergency prevention of influenza in families with the use of remantidin and sanitary-educational work. Two factors were found to affect population immunity, mass vaccination to control influenza A virus and natural morbidity with regard to influenza B because of the absence of influenza B virus in the vaccines used. Effectiveness of influenza control increased in proportion to extensiveness of the vaccination program. References 5 (Russian).
[1526-2791]

DRUG PRODUCTION DELAYED

Moscow MEDITSINSKAYA GAZETA in Russian 1 Jun 84 p 1

DENISOVA, G., interviewer

[Abstract] In an interview, Professor R. G. Glushkov, corresponding member of the USSR Academy of Medical Sciences and director of the All-Union Chemical-Pharmaceutical Scientific Research Institute, assesses the status of work which this institute and other organizations are doing on new medicinal preparations.

Glushkov reports that the All-Union Medicine Synthesis (Soyuzleksintez) Research and Production Association is preparing to produce the first industrial

lots of six new drugs developed at his institute. Among them are dexamethasone, a fluoridated corticosteroid; a vasodilator called ksantinol nikotinat; and an antimycotic and antiviral preparation called riiodoksol.

Commenting on problems of introducing new drugs into production and public-health practice, Glushkov says this is being delayed primarily by a shortage of production capacities. He notes that a substantial portion of the pharmaceutical industry's capacity is being used to produce drugs that have become obsolete. The assortment of sulfanilamide drugs in production (more than 20 items) is unjustifiably broad, for example. Glushkov recommends organizing the production of sul'faton, a versatile antibacterial preparation, as an effective replacement for a portion of these products. He also complains that the industry's raw-materials suppliers--the chemical and petrochemical industries--do not always meet its requirements. This in turn prevents the pharmaceutical industry from filling many of the orders it receives from medical personnel.

FTD/SNAP
CSO: 1840/751

ANTIMICROBIAL ARENARIN OINTMENT FOR EYE BURNS

Moscow MEDITSINSKAYA GAZETA in Russian 27 Jun 84 p 3

SMIRNOV, V., corresponding member of the Ukrainian Academy of Sciences, director of the academy's Institute of Microbiology and Virology; NEGRASH, A., candidate of Biological sciences

[Excerpt] A new antimicrobial preparation--a pne-percent arenarin eye ointment--has been developed at the Institute of Microbiology and Virology, Ukrainian Academy of Sciences, for the treatment of chemical and thermal burns of the eyes.

This preparation has an antibacterial effect on Gram-positive types of bacteria which are resistant to antibiotics, including staphylococci and streptococci. It is of low toxicity and has no side effects.

Arenarin also has an anti-inflammatory effect and stimulates regenerative processes in tissues.

The first lot of ointment for therapeutic use will be produced in 1985.

FTD/SNAP
CSO: 1840/751

MEDICAL COMPUTER OVERHAULED FOR MULTIPLE USERS

Moscow PRAVDA in Russian 4 May 84 p 6

ZHIGAYLOV, Yu., correspondent, ARkhangel'sk

[Abstract] This short article reports on the creation of a multiple-user consultative system at the computer center of the Arkhangel'sk Medical Institute. The system will provide access to a computer for consultation on diagnosis and treatment by physicians at outlying medical facilities of Arkhangel'sk Oblast, and even on ships. It will be able to respond to 15 subscribers simultaneously.

Personnel of the institute's chair of physics, which is headed by A. Karanin, are overhauling a nine-year-old computer for the system. Its processor has been replaced with an improved one, and its on-line storage capacity has been doubled. Replacement of another device will increase the data-processing speed by 10 times. It is said that the modifications will bring the computer's capabilities up to those of the best third-generation machines.

FTD/SNAP
CSO: 1840/753

UDC 616-053.2-082:008(47+57-22)

IMPROVEMENT IN RURAL PEDIATRIC HEALTH SERVICES

Moscow SOVETSKOYE ZDRAVOOKHRANENIYE in Russian No 5, May 84 (manuscript received 28 Jun 83) pp 30-32

AVRAMENKO, A. I., Kiev Oblast Department of Health

[Abstract] One of the most serious problems facing Soviet health care is the disparity between the quality of care in the urban and rural settings. An analysis of the statistical data on child health care in Kiev Oblast for the period 1975-1980 provided confirmation for this state of affairs in the Oblast. The analysis revealed that 50-60% of the pediatric positions in the rural regions remained open, that physician visits per rural child were 2.2-fold less frequent than for the city child, and that 30% of the pediatric visits were to the therapist. As a result of initial steps taken to improve child care in the villages, these indicators showed a marked improvement. The changes consisted of administrative measures to strengthen the central rayon hospitals, improve pediatric services, and render them more accessible to the population. As a result, rural childhood mortality decreased by 40.6% in the 1975-1980 period.
[722-12172]

FRAUD AND CORRUPTION IN TIKHVIN, VYBORG SECONDARY MEDICAL SCHOOLS

Leningrad LENINGRADSKAYA PRAVDA in Russian 22 Jul 84 p 2

KIRILLOV, Yu.

[Abstract] A newspaper satire describes a case of bribery and corruption at the Tikhvin Secondary Medical School. The school director, Mikhail Mikhailovich Boytsev, indulged in dishonest practices by enrolling students from the southern part of the country and, for a substantial bribe, providing unauthorized living accommodations while they remained at the school. Students paying bribes were awarded their diplomas quickly so that they could return to the milder climes of the south. In order to boost his illegal activities even further, Boytsev enrolled 323 students (against a maximum of 300 scheduled for the school), and a total of 406 people were found to be living in the school hostel even though only 323 had been officially enrolled. Records were falsified in the physician's assistant and nursing departments. Boytsev was tried by the Leningrad Oblast Court and sentenced to 4 years in prison, with confiscation of property. Two secondary school graduates who conspired with him, B. Atabekov and V. Antilava, were also sentenced to long terms of imprisonment, with confiscation of property. Subsequently it was also discovered that bogus diplomas were being dispatched via the mails to one A. S. Alekseyev, deputy director of the Vyborg Medical School. Investigation of this fraud continues. Irregularities were also found in the activities of the oblast medical department chief, A. K. Kondrashov. No references. [9642-1552]

LENINGRAD EMERGENCY MEDICAL SERVICES

Leningrad LENINGRADSKAYA PRAVDA in Russian 5 Aug 84 p 2

BOGOSLOVSKAYA, Ye., SAPUNOVA, G. and CHESANOVA, T.

[Abstract] Organizational problems in the operation of Leningrad's emergency medical services [Skorayapomoshch] are discussed. The siting of ambulance stations is not ideal, but improvements will entail major administrative problems in providing premises and possibly resettling local residents in other housing in order to make physical space for the ambulance stations. Plans drawn up by the executive committee of the city soviet call for the organization of five new strategically located stations, but the plan is behind schedule. Improvements are also needed in the support services for the emergency medical services, such as vehicle maintenance, compilation of duty rosters for personnel, provision of essential medical equipment, and coordination of various medical services. All emergency stations are equipped with the "Foton" portable EKG machines with a modem capability for transmitting EKG readouts via the telephone system to a cardiac center at central dispatch. However, the involved telephone lines are not operational, and many of the "Foton" units malfunction. Many of the accident cases admitted to the hospitals are alcohol related. As many as 30-40 percent of cases delivered to the medical facilities by the emergency services are found to be "unjustified,"

with patients suffering only from alcoholic intoxication. This circumstance is placing an unnecessary load on the emergency services. Some patients also call the emergency services when in fact, although they require medical assistance, they are quite capable of themselves going to a medical facility without the aid of the emergency services. Many physicians are complaining about the abuses of the emergency services. The polyclinics themselves must bear some of the blame here: inadequate services and followups and physicians' lack of proper attention to patients. It is suggested that a partial solution to the problem could be making citizens responsible in some way for unjustified calls made to the emergency medical services. Letters from citizens indicate that they would respond favorably to the establishment of precise rules for calling in the emergency medical services, as has already be done in other cities. Steps already taken in this direction by the Leningrad city executive council are inadequate and further organizational meaasures should be implemented. No references.

[9642-791]

RADIATION BIOLOGY

BIOLOGICAL RESEARCH WITH IBR-2 FAST-NEUTRON REACTOR

Moscow SOVETSKAYA ROSSIYA in Russian 9 Jun 84 p 1

[Unattributed article]

[Text] Dubna--International groups of physicists of socialist countries have been actively pursuing basic research and applied work with a unique neutron source--a fast-neutron pulsed reactor (IBR-2) which was put into operation recently. This reactor has opened up qualitatively new possibilities for investigating the structure of matter that are beyond the capabilities of other sources of radiation. Intense flows of neutron radiation are being used for studying the structure of crystals, liquids, polymers and biological specimens.

Academician I. M. Frank, director of the neutron physics laboratory of the Joint Institute for Nuclear Research, gave a report on these projects at a session of the institute's scientific council which was held here. He pointed out that the new reactor develops exceptionally high power in its pulses--1.4 million kilowatts. Valuable scientific results, including ones of applied importance, have already been obtained in experiments with the IBR-2. Progress has thus been made in understanding the structure of ribosomes, using the method of small-angle scattering of neutrons. Ribosomes are complex molecules which play an important role in the life of cells. Properties of cell membranes are being successfully studied. Studies of so-called superion conductors, i.e., solid electrolytes, which are being conducted with the IBR-2 may be of great practical importance for the advancement of power engineering of the future.

FTD/SNAP

CSO: 1840/754

UDC 664.577.15

STERILIZATION OF ENZYME PREPARATIONS BY COMBINED RADIATION METHODS

Moscow PRIKLADNAYA BIOKHIMIYA I MIKROBIOLOGIYA in Russian Vol 20, No 2,
Mar-Apr 84 (manuscript received 5 Nov 84) pp 239-244

SAMOYLENKO, I. I., FEDOTOV, N. S., TUMANYAN, M. A. and KOROLEV, N. I.,
Institute of Epidemiology and Microbiology imeni N. F. Gamaleya, USSR
Academy of Sciences, Moscow

[Abstract] Evaluation was made of several methods of sterilization of various enzyme preparations (trypsin, papain, chymotrypsin, amyloridine) contaminated by *E. coli* cells and *Bacillus anthracoides* spores. The modalities tested consisted of irradiation with Co-60 (50 Cy/min, 1-15 kGy) in combination with hyperthermia (50°C for 60 min) or with variable magnetic field exposure (750 Oe, 50 Hz). The results showed that the ionizing radiation + magnetic field or ionizing radiation + heat combinations were highly effective in reducing the viability of vegetative bacterial cells and spores. Concomitantly, such methods of sterilization had no significant effects on the activities of the various enzymes in the study. A gamma radiation dose of 10 kGy was found sufficient to ensure sterilization of the enzymatic preparations. Figures 1; references 11: 8 Russian, 3 Western.
[1516-12172]

UDC 616.919.579.843.1].015.46:615.849.114

EFFECTS OF γ -IRRADIATION ON IMMUNOBIOLOGICAL AND IMMUNOCHEMICAL PROPERTIES OF CHOLERA EXOTOXIN. PART 2. IMMUNOGENICITY OF NON-PURIFIED IRRADIATED TOXIN FILTRATE

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 5,
May 84 (manuscript received 18 Nov 83) pp 111-112

RUBTSOV, I. V., NEDUGOVA, G. I. and SAMOYLENKO, I. I., Central Scientific
Research Institute of Epidemiology, USSR Ministry of Health, Moscow

[Abstract] In order to test the effects of ionizing radiation on the immunogenicity of cholera toxin, trials were conducted on the immunization of rabbits with unpurified toxin filtrate inactivated by γ -irradiation with a

standard dose (50 kGy) used for toxoid formation. The rise in antibody titers was identical to that obtained by immunization of the rabbits with standard toxoids, yielding two lines of precipitation on gel diffusion (one corresponding to the cholera toxin, and the other to the O-antigen). Maximum titers with the irradiated toxin and the control toxin were obtained on day 21. The somewhat greater immunogenicity of the irradiated preparation was ascribed to radiation-induced polymerization and aggregation of the toxin. [1529-12172]

UDC 577.391

RADIOSENSITIVITY OF MONGOLIAN GERBILS GROWN IN VIVARIA

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 275, No 5, Apr 84
(manuscript received 19 Aug 83) pp 1208-1210

DOMAREVA, O. P., POPOVA, M. F., SAMOKHVALOVA, N. S. and BULYAKOVA, N. V.,
Institute of Evolutionary Morphology and Ecology of Animals imeni A. N.
Severtsev, USSR Academy of Sciences, Moscow

[Abstract] Ionizing radiation doses vary for different subjects, and some tests have indicated that laboratory animals are more sensitive to radiation than their natural counterparts. Heredity, metabolic differences and physiological state have been related to this phenomenon. The present article reports on study of Mongolian gerbils (peshanki) that had been raised in vivaria since their ancestors were brought from the Tuva ASSR 8 years previously. Test gerbils were fed grain and hay along with wet rations of beets, carrots, cabbage and grass, with no water. Then they were administered radiation doses similar to ones received by their ancestors 8 years before. With doses of 8.0 grams-roenten, gerbils began to die on the 10th day after radiation, while with 12.0 grams-roentgen deaths began on the 5th day. Comparison of radiation effects for the vivarium group and for their wild ancestors indicated that those in captivity were much more sensitive to irradiation. Thus, data generated using wild animals raised in captivity cannot be extended to their natural counterparts. References 11: 9 Russian, 2 Western. [708-12131]

UDC 619:578.08

MODERN APPROACHES TO DEVELOPING VIRUS CONTROL VACCINES AND DIAGNOSTIC REAGENTS

Moscow VETERINARIYA in Russian No 6, Jun 84 pp 23-26

SYURIN, V. N. and KARELIN, V. P., Moscow Veterinary Academy

[Abstract] This is review article. Attention is directed to the contribution that gene engineering can play in the construction of new veterinary prophylactic and therapeutic agents. Developments to date in pertinent molecular biological studies are reviewed. Accomplishments reported in Soviet, but primarily non-Soviet, literature are catalogued. Cited are gene engineering methods in production of strains which can produce therapeutic peptides (insulin, vaccines, interferon, hormones), enzymes and aminoacids, induction of synthesis of neutralizing antibodies, bioorganic synthesis of antibodies, establishment of sequence of amino acids in peptides, and sequence of nucleotides in nucleic acids, preparation of foot and mouth disease vaccine, molecular cloning, monoclonal antibodies (influenza, rabies), hybrid cells, fixation of specific antigens of tumor cells and prospects for development of monoclonal antibody for insight into bodily immune systems.
[772-8586]

UDC 619:614.47:616.988.73

SIMULTANEOUS AEROSOL VACCINATION OF CHICKS AGAINST INFECTIONS LARYNGEAL TRACHEITIS AND NEWCASTLE DISEASE

Moscow VETERINARIYA In Russian No 6, Jul 84 pp 30-31

DUTKO, Yu. S., MAVLIKAYEV, R. G. and BURTSEV, V. I. (deceased), All-Union Scientific Research Institute of Veterinary Virology and Microbiology, POPOVA, N. A. and MOTYLEV, V. F., Tomilinskoye Industrial Production Association

[Abstract] The procedure used in the title work employed the method of aerosol associated vaccination of chicks against several diseases developed in 1978 at the All-Union Scientific Research Institute of Veterinary Virology and

Microbiology. The Newcastle vaccine used was strain B, and La Sota, that for ILT was a strain from VNIIBP [All-Union Scientific Research Institute of Biological Preparations?]. Aerosol generator was the SAG-1. While leghorn chicks, 38-45 days old, were tested. Tabulated data reveal that the aerosol technique, following appropriate dosage precautions, gave satisfactory results; a once-repeated vaccination produced a 6-month immunity from the two diseases.
[772-8586]

UDC 619:616.988-071:636.4

DIAGNOSIS OF VIRAL TRANSMISSIVE GASTROENTERITIS OF SWINE

Moscow VETERINARIYA in Russian No 6, Jun 84 pp 34-35

KIR'YANOV, S. A. (scientific director, professor V. T. Kotov, candidate of Veterinary Sciences A. G. SHAKHOV), All-Union Scientific Research Institute of Non-Contagious Diseases of Animals

[Abstract] Viral (transmissible) gastroenteritis of pigs (VTGES) involves high morbidity and death of suckling pigs up to the tenth day of age. It is widespread and is characterized by an extended course on farms which use a continuous breeding operation. VTGES is presently diagnosed by clinical-epizootological pathomorphological methods, a biological specimen test, immunofluorescent and enzymal methods, serology and isolation of the virus in cell cultures. The animals studied had been collected from 22 farms in different zones; brucellosis, leptospirosis and tuberculosis were ruled not present. Methods (intranasal, contact) of infection, affected animals and mortality are tested. The diagnosis must utilize a combination of the methods cited above to establish VTGES presence. It is considered to be obligatory to employ these procedures whenever the disease is suspected.
[772-8586]

IMPROVING TRAINING FOR VETERINARY PHYSICIANS

Moscow VETERINARIYA in Russian No 6, Jan 84 pp 70-71

ZHAKOV, M. S., rector and BEZBORODKIN, dean, Veterinary Faculty, Vitebsk Veterinary Institute

[Abstract] A report is presented in praise of the virtues of the authors' faculty. The need for well-trained, qualified young veterinary physicians in rural Soviet areas is emphasized. This article points out that the Vitebsk institute is meeting the need to train such personnel. The student sector has give clinics, a library, two gymnasiums, a club and a dining hall. Teaching skills of the faculty are sharpened by a pedagogical seminar which invites exchange lecturers and laboratory experts, to exploit their talents. Communist-oriented teaching plans are in effect. A komsomol unit is active.

The student is approached as an individual by the teaching staff (identified by name). Ability for smooth, productive interaction with other persons, e.g., future co-workers and subordinates, is fostered. Farm economy and management techniques are inculcated. In one year, over 700 animals receive ambulatory therapeutic care, and 400, hospital care, in which the students participate. More than 600 students participate yearly in student science conferences, and in vuz, oblast, republic and All-Union competitions.
[772-8586]

UDC 619:615.372:616.988.25:636.4

MONITORING IMMUNOGENICITY OF TESCHEN'S DISEASE VACCINE

Moscow VETERINARIYA in Russian No 4, Apr 84 pp 24-26

ZHESTEREV, V. I., SERGEYEV, V. A., KOLOMYTSEV, A. A. and YEVSEYEV, V. M.,
All-Union Scientific Research Institute of Veterinary Virology and Microbiology

[Abstract] This article reports results of development of methods to assay the immunogenicity of an emulsification-inactivated Teschen's disease vaccine proposed by the authors' institute in 1978. Sensitivity of swine to experimental infection as a function of age, method of administration of a pathogenic strain of the virus (Transcaucasis strain), its accumulation in the tissues of the infected animals and change in activity during storage of the vaccine were studied. Vaccine immunogenicity of the vaccine for swine and guinea pigs were compared on the basis of infection and of virus-neutralizing antibody titer. It was determined that immunogenicity requires testing on 1.5-2 month old piglets, six per series; degree of infection must be assessed 30-days after intracerebral administration of the virulent virus. Specific activity of the vaccine can be determined on the basis of the titer of virus-neutralizing antibodies. The vaccine is considered immunogenic if the titer, in each of the vaccinated piglets, is no less than 1:64. Antibody levels achieved in swine were higher than in guinea pigs and it was not yet resolved whether the latter can be used to assay vaccine immunogenicity.
[774-8586]

UDC 619:615.371:616.988.73

TRIAL OF VIRAL VACCINE FROM STRAIN BOR-74 VGSKI

Moscow VETERINARIYA in Russian No 4, Apr 84 pp 27-28

SHUL'GA, V. I., Head Veterinary Physician, Poultry Farm "Za Mir",
Dnepropetrovsk Oblast

[Abstract] The VGSKI [not further identified] Veterinary Preparations establishment has developed a new, Soviet vaccine against Newcastle disease, from

strain BOR-74 VGNKI. It has been used by the author since 1981, at an egg-producing poultry farm. Chicks were vaccinated at 20-27 days, and re-vaccinated in 120-130 days--1.74 million by aerosol and 0.16 million in drinking water. Protective titers were determined in the animals treated; no statistical differences were noted in the effectiveness of either method of administration. Although extended immunity was achieved with the title vaccine, an additional period of observation is suggested before acceptance of the vaccine is granted.
[774-8586]

UDC 619.616.595.42-084

CONTROL OF TICK CARRIERS OF PARASITIC BLOOD DISEASE PATHOGENS

Moscow VETERINARIYA in Russian No 4, Apr 84 pp 38-39

KAN, P. T., All-Union Scientific Research Institute of Veterinary Sanitation

[Abstract] In 1950, B. I. Pomerantsev described more than 60 species and sub-species of Ixodide ticks, in 6 genera, which were found in the USSR. Forty of these species parasitize farm animals and 25 of the 40 transmit blood disease pathogens. Protection of animals from invasion of these ticks is one way to prevent pyroplasmidoses. Keeping cattle off pasture is resorted to; chemical agents are used to protect animals which are let out to pasture. Common agents used include klorofos, tsiodrin, dursban, benzofosfat (fozalon) and dikresil; baths and showers are used at set intervals. Variations required for these agents are noted; contamination of milk (from treated cows) must be avoided. Destruction of ticks, e.g., by aerol-2, is an effective procedure on tick-infested sites. It is felt that prevention of pyroplasmidoses can be achieved by effective use of available chemical resources.
[774-8586]

FIRST INTERNATIONAL SEMINAR ON GENERAL EPIZOOTOLOGY OF CEMA MEMBER NATIONS

Moscow VETERINARIYA in Russian No 4, Apr 84 p 63

BAKULOV, I. A.

[Abstract] The title seminar was held in Vratse, Bulgaria and was attended by delegations from Bulgaria, Hungary, Poland, Romania, Czechoslovakia and the USSR. Discussions were held on the problems and characteristics of epizootology, disinfection, rodent control, efficacy of counter measures and identification of outbreaks. Cooperation between the CEMA members, on operational procedures, diagnoses and infectious diseases and on information exchange, was stressed. Terminology adjustment was felt to be needed. Cited contributors include Ts. Txonev, S. Karadzhev, G. Gavrilov (Bulgaria),

S. Kalav (CSS), M. Sastone (Hungary), I. A. Bakulov, Yu. A. Malakhov, I. P. Ovdiyenko and A. A. Seminikhin (USSR). Exchange of publications, interchange of personnel and common research projects were felt to be helpful.

[774-8586]

UDC 578.833.24:578.23

JAPANESE ENCEPHALITIS VIRUS PERSISTENCE IN L₉₂₉ CELLS. CORRELATION OF VIRAL AND CELLULAR FACTORS

Moscow VOPROSY VIRUSOLOGII in Russian Vol 29, No 1, Jan-Feb 84
(manuscript received 7 Feb 83) pp 74-78

URYVAYEV, L. V., DERYABIN, P. G., TAZULAKHOVA, E. B., PARASYUK, N. A. and LOGINOVA, N. V., Institute of Virology imeni D. I. Ivanovskiy, USSR Academy of Medical Sciences, Moscow

[Abstract] Study of the first stage of Japanese encephalitis persistence in L₉₂₉ cell cultures was performed to test the hypothesis that virus persistence in the cells is regulated by a multi-factor mechanism with each factor being more or less important at different stages of persistence. The role of interferon, defective particles, change of the ts-trait of the initial virus and preservation of genetic material in cytoplasm of chronically-infected cells was studied. Passage of the chronic stage of persistence of the tick-borne encephalitis virus produced, first, interferon accumulation in the system with assumption by interferon of the leading role in the chronicity of the mechanism and, second, development of the ts-trait in the persisting virus population and appearance of defective virus particles in the system. Study of biological activity of nucleic acids from tick-borne encephalitis cells suggested existence of infectious RNA in cytoplasm of infected cells and the possible connection of the Japanese encephalitis genome with nuclear DNA of L₉₂₉ cells in the persistence mechanism. References 19: 8 Russian, 11 Western.
[1530-2791]

UDC 616.98:578.833.2}-078.73

INDIRECT HEMAGGLUTINATION REACTION FOR INDICATION OF HEMORRHAGIC FEVER WITH RENAL SYNDROME (HFRS) VIRUS AND LABORATORY DIAGNOSIS OF DISEASE

Moscow VOPROSY VIRUSOLOGII in Russian Vol 29, No 1, Jan-Feb 84
(manuscript received 2 Jun 83) pp 82-85

GAYDAMOVICH, S. Ya., KLISENKO, G. A., TKACHENKO, Ye. A., DZAGUROVA, T. K. and REZAPKIN, G. V., Institute of Virology imeni D. I. Ivanovskiy, USSR Academy of Medical Sciences; Institute of Poliomyelitis and Virus Encephalites, USSR Academy of Medical Sciences

[Abstract] Development of an erythrocytic immunoglobulin diagnosticum for virus hemorrhagic fever with renal syndrome (HFRS) is described; optimum

conditions of use of the indirect hemagglutination reaction to detect the virus antigen in field materials is discussed and use of the indirect hemagglutination inhibition reaction for laboratory diagnosis of infection is described. A 5-10 percent suspension of lung tissue of wild rodents trapped in natural foci of HFRS in the Bashkir ASSR was used in determination of the presence of HFRS virus. The indirect hemagglutination inhibition reaction method for detecting and titrating HFRS virus antibodies proved to be as sensitive as the indirect fluorescing antibodies method and more sensitive than isoenzymic analysis and radioimmunological analysis. The indirect fluorescing antibodies method is more laborious and more complicated than the indirect hemagglutination reaction method. References 19: 10 Russian, 9 Western. [1530-2791]

UDC 578.833.1:578.53².08

INDUCTION OF TS-MUTATIONS OF ALPHAVIRUSES BY N-METHYL-N-NITRO-N-NITROSOGUANIDINE DURING ACTION ON REPLICATING VIRUS

Moscow VOPROSY VIROSOLOGII in Russian Vol 29, No 1, Jan-Feb 84
(manuscript received 27 May 83) pp 86-89

SHABLINSKAYA, L. M. and TSILINSKIY, Ya. Ya., Institute of Virology imeni D. I. Ivanovsky USSR Academy of Medical Sciences, Moscow

[Abstract] Induction of ts mutants of Sindbis virus and eastern equine encephalitis virus by action of N-methyl-N-nitro-N-nitrosoguanidine (MNNG) on intracellular virus and comparison of mutability of Sindbis virus and eastern equine encephalitis virus showed that low concentrations of MNNG (35 µg/ml) have a pronounced toxic effect on chick embryo fibroblast cells and prevent virus multiplication. Attempts to determine conditions which permit action of MNNG on reproducing virus employed 15-20 g/ml concentrations of MNNG and 4-hour exposure. MNNG added to chick fibroblast cultures infected with Sindbis virus for 4 hours induced ts mutations in the virus but that added to eastern equine encephalitis virus did not induce ts mutations under identical conditions. Level of ts mutants in the mutagenized populations of Sindbis virus was 7.9 percent. Practical and theoretical importance of these findings is discussed. Figure 1; references 10: 1 Russian, 9 Western. @1530-2791]

UDC 578.833.26.086.2.083.3

IMMUNOELECTRON MICROSCOPY OF VIRUSES OF TICK ENCEPHALITIS COMPLEX

Moscow VOPROSY VIROSOLOGII in Russian Vol 29, No 1, Jan-Feb 84
(manuscript received 4 Apr 83) pp 114-118

KADOSHNIKOV, Yu. P., DEMENEV, V. A., GAYDAMOVICH, S. Ya., KLIMENKO, S. M. and OBUKHOVA, V. R., Institute of Virology imeni D. I. Ivanovskiy, USSR Academy of Medical Sciences, Moscow

[Abstract] Study of the possibility of determining viruses of a tick-borne encephalitis complex by use of immunoelectron microscopy [IEM] with maximum

simplification of the process showed the direct IEM method which was developed has sufficient resolving power to indicate the virus in brain suspensions of suckling mice. The method revealed aggregation of virions at dilutions of immune ascitic fluids of up to 1:80 with reference to initial titers in the complement fixation reaction. The virus aggregates generally contained elements of cellular detritus. Use of immune ascitic fluids pre-processed by kaolin did not reveal individual representatives of the tick-borne encephalitis complex and no cellular elements were found in the immune complexes in these cases. Experiments involving addition of EDTA to the working solution showed a lesser number of immune complexes and virions in the aggregates in comparison with preparations containing no EDTA. Figure 1; references 17: 9 Russian, 8 Western.

[1530-2791]

CONFERENCES

UDC 616.1-036.4-07+616.1-084:061.2(47+57)"1983"

ALL-UNION CONFERENCE: "EARLY DIAGNOSIS AND PREVENTION OF CARDIOVASCULAR DISEASES

Moscow KARDIOLOGIYA in Russian No 6, Jun 84 pp 119-125

[Article by A. N. Britov, A. I. Martynov and A. L. Vertkin]

[Text] The conference was held 8-10 June 1983 in Novosibirsk*.

In his report, V. A. Koshechkin, chief of the Cardiology Administration of the Therapeutic and Prophylactic Aid Main Administration of the USSR Ministry of Health, presented data on the development of cardiology services in the country. Eleven republics have cardiology scientific research institutes. In the 10th Five-Year Plan 9 cardiology treatment and prevention clinics were created, in addition to over 700 cardiology departments, 2261 cardiology consulting offices, and 439 emergency cardiology teams. In the 11th Five-Year Plan there are plans to organize 73 cardiology treatment and prevention clinics, to increase the current number of hospital cardiology departments, and to create 3648 cardiology consulting offices at polyclinics and 1578 emergency cardiology teams.

Arterial Hypertension, Epidemiology, Risk Factors, and Prevention

R. G. Oganov et al. (Moscow) reported on the initial results of a cooperative program for the prevention of arterial hypertension in 20 cities in this country. The program is being implemented by the Preventive Cardiology Institute of the All-Union Cardiological Center of the USSR Academy of Medical Sciences together with 25 scientific and practical institutions. The study includes over 70,000 people between the ages of 30 and 54. Of this group, 23 percent have been found to have arterial hypertension. The results of repeated screenings showed that the number of people involved in treatment after 1 year in the active intervention group increased from 21 to 73 percent of the number of people with relatively stable arterial hypertension. An evaluation of the effectiveness of the program in organized populations in Moscow indicates that there is a trend toward a statistically significant reduction in over-all mortality in the group subjected to active intervention.

*"Early Diagnosis and Prevention of Cardiovascular Diseases", Novosibirsk, 1983. Part 1. Hypertension, 307 pages. Part 2. Ischemic Heart Disease, 472 pages.

The incidence of hypertension among workers at industrial enterprises and in agriculture, according to the results of various authors, ranges from 12.6 to 39.3 percent, with hypertension occurring more frequently among drivers, machine operators, people working under noisy conditions and with vibration, and workers in assembly shops. The incidence of arterial hypertension increases with age from 16.2 percent and approximately doubles over a period of 20 years. The increase in arterial pressure in about half of the individuals with arterial hypertension is known; 10.2-20.3 percent are treated regularly, with no more than 13.5 percent of the patients being treated effectively. Clinical observation with adequate medication helps to increase significantly the number of patients being treated effectively (A. N. Britov et al., Moscow; V. A. Mironov et al., Perm; and others).

A. M. Shishova and L. V. Chazova (Moscow) reported on the results of a five-year program to combat arterial hypertension among an unorganized population. The number of cases of temporary disability decreased by 32.2 percent and the number of lost work days dropped by 43.3 percent. N. A. Andreyev et al. (Riga) reported on the development of and positive experience gained in using a mini-computer with combined rheopolycardiography to identify, differentiate, and treat patients with arterial hypertension. Z. A. Kalandiya (Voroshilovgrad), A. P. Bondarenko et al. (Zaporozhye) and others have used computers for early diagnosis of arterial hypertension.

V. M. Vyarshalite and O. K. Grinkevichene (Panevezhis) presented norms for arterial pressure among schoolchildren based on sex, age, and height. According to data from a six-year study conducted by Ye. A. Nadezhdina and K. Yu. Petrosyan (Moscow), arterial hypertension was detected in 14.3 percent of 1493 schoolchildren between 12 and 13 years old. Persistent hypertension was found in 2.9 percent of a group of adolescents, and it was detected more often in girls (L. S. Il'ina and S. S. Goncharov, Irkutsk). Risk factors for juvenile hypertension include increased body weight, negative family relations, and a hereditary predisposition (L. V. Bal' and T. M. Vishnevskaya, Moscow; S. Yu. Tursunov et al., Andizhan). Risk factors for adults also include a reduced taste sensitivity to salt, nervous and psychological factors, unhealthy habits (smoking, alcohol abuse), and certain psychological and personality characteristics (F. B. Berezin et al., Moscow; S. S. Belousov and T. S. Ozerkova, Perm; and others).

A study of 1456 adults over the course of 10 years showed that those most in danger of developing hypertension are individuals with arterial pressure in the "danger zone". Among other factors affecting the development of hypertension are episodic increases in arterial pressure, "hypertensive" reaction in arterial pressure to a load, age over 40 years, and being male (V. S. Volkov and A. Ye. Tsikulin, Kalinin).

L. S. Myakisheva and V. P. Osotova (Izhevsk) believe that in order to expand the possibilities of early diagnosis and prevention of hypertension among the adult population, risk groups should be determined at school age and these groups should undergo clinical examination.

T. N. Logveyeva et al. (Donetsk) proposed a method for evaluating an individual's risk for developing hypertension. A. Baubinene and Ya.

Pyatrauskene (Kaunas) noted that the out-patient system is not enough to identify people with arterial hypertension. For example, arterial pressure is measured in only 66-75 percent of the people who come in for medical assistance.

Pathogenesis. K. R. Sedov and S. I. Ivanova (Irkutsk) believe that the hypertensive state is the result of a regulatory reaction in response to ischemia in separate organs or to widespread ischemia in tissues as a consequence of the pressor response of the small vessels. The limitation of the depressor function of the kallikrein kinin system by accelerating the breakdown of bradykinin in the lungs (V. V. Karpitskiy, Yalta) plays an important role in the formation and development of hypertension. Ye. Ye. Gogin and A. D. Martynyuk (Moscow) determined that when arterial hypertension develops in the presence of ischemic heart disease, the signs of activation of the kidney pressor mechanism are absent, while these signs are evident when there is primary development of hypertension in the form of increased renin activity in the blood plasma, increased concentrations of aldosterone, and a reduction in sodium uresis.

During the development of hypertension various changes take place in the indicators of central and pulmonary hemodynamics and in indicators of the status of pressor and depressor neuro-humoral systems and the blood's ion composition, which must be taken into account when therapeutic and preventive measures are being taken (A. V. Tuyev et al., Perm). I. A. Gundarov et al. (Moscow) believe that cardiac and vascular mechanisms participate simultaneously in a pathological increase in mean arterial pressure with any type of circulation. The hemodynamic profile of hypertension is formed by the relationship of these mechanisms and the degree of activity. Ye. V. Belova et al. (Moscow) showed that in patients with labile arterial hypertension there is no marked connection between indicators of central hemodynamics and renal pressor factors (renin, aldosterone). Z. K. Trushinskiy et al. (Moscow) believe that extreme arterial pressure values should not be viewed as the early stage of hypertension, but as a variant from the norm with hyperreactivity of neuro-endocrine regulatory mechanisms that control arterial pressure.

Diagnosis. The reports given by I. P. Zamotayev et al. and A. I. Martynova (Moscow) contained norms for changes in arterial pressure in healthy individuals using a cycle ergometer test and they described the role of a physical workload test not only in the detection of latent arterial hypertension, but also in monitoring the effectiveness of therapy. V. M. Al'khimovich (Minsk), T. A. Yevdokimova and V. G. Bershadskiy (Leningrad) pointed out the practical importance of this method for adults and T. N. Malyarenko (Tambov) and T. G. Vatsadze et al. (Tbilisi) described its practical importance for children.

Ye. V. Yevdokimova et al. (Chelyabinsk) determined that the incidence of a hypertensive reaction in arterial pressure to a workload increases with age and the presence of other risk factors for ischemic heart disease. E. A. Mayte (Tartu) and G. L. Kats and S. A. Shchedrin (Donetsk) noted that it is characteristic of hypertension for there to be an increase primarily in diastolic arterial pressure in response to a workload. Individuals with a hypertensive response in arterial pressure to a workload, which is followed by

an increase in the activity of renin in the blood plasma and the content of cyclic AMP and cyclic GMP, represent a group with a higher risk of developing hypertension (N. A. Zinov'yeva et al., Leningrad).

Early detection of arterial hypertension in individuals with normal arterial pressure at rest is also possible with the use of graded workloads (G. I. Sidorenko and M. N. Antonovich, Minsk), modeling of emotional stress (R. P. Ol'kha et al., Moscow), determination of the vessels' reactivity to noradrenalin, the concentration of catecholamines, serotonin, renin, gluco- and mineralocorticoids in the urine in the presence of an acute salt load and after the introduction of furosemide (I. Sh. Sherental' et al., Novosibirsk), and immersing the subject in a thermoneutral liquid (V. N. Orlov et al., Moscow). K. N. Yemeshin et al. (Baranaul) proposed a method for a complex automated evaluation of the status of hemodynamics for early diagnosis of arterial hypertension. Ye. V. Gembitskiy et al. (Moscow) have started to use an electropuncture diagnostic method to determine the functional status of the cardiovascular system.

Data from angioscopy of the bulbar conjunctiva and rheo- and electroencephalography provide early indicators of vascular damage in patients with hypertension (O. M. Bazanova, Novosibirsk; O. A. Kharchenko et al., Dnepropetrovsk; N. S. Brozhik et al., Rovno).

The reports of A. A. Aleksandrov et al. (Moscow) and I. M. Vorontsov et al. (Leningrad) were devoted to methods for detecting arterial hypertension in children and adolescents. They demonstrated that transitory and labile increases in arterial pressure in this group of individuals cannot serve as a criterion for a certain phase of pathological hypertension. Determination of the cardiovascular system's response to a physical load and a salt load, and a study of the reactivity of cutaneous vessels to vasopressor substances makes it possible to detect primary arterial hypertension in adolescents and young people at the earliest stage under conditions of spontaneous normalization of arterial pressure (S. M. Gavalov and A. I. Khodanov, Novosibirsk).

Also discussed at the conference was the question of differential diagnosis of first-stage hypertension and dysfunction in neuro-circulatory pressure. L. I. Ol'binskaya and V. Ya. Golyakov (Moscow) used a set of clinical and instrumental research methods with a load test and an analysis of the heart's bioelectric and mechanical activity and the dynamics of arterial pressure and the cardiovascular system to develop criteria for differential diagnosis of these illnesses. T. A. Sorokina (Riga) also confirmed that these illnesses can be differentiated using instrumental research methods, including rheocardiography, rheoencephalography, and rheovasography. Ye. V. Pomerantsev et al. (Moscow) used research on hemodynamics, myocardial contractility, and coronary-venous lactate difference to show that dysfunction in neuro-circulatory pressure is "a precursor of organic pathology."

Algorithms for differential diagnosis of early signs of hypertension were developed by I. A. Popov (Voroshilovgrad) and Yu. L. Naumov (Novosibirsk). A. V. Lapko and L. S. Polikarov (Krasnoyarsk) have made the first attempts at using mathematical modelling methods for the force of blood flow and for specific prevention of hypertension.

V. P. Pomerantsev et al. (Moscow) developed a noninvasive method for diagnosis of myocardial insufficiency in patients suffering from hypertension.

Population studies showed that among individuals with increased arterial pressure, 95 percent have hypertension, while in the rest arterial hypertension is symptomatic. Patients with second-stage hypertension are those with the highest risk of myocardial infarction and interrupted blood flow to the brain. Therapy for patients suffering from hypertension should not be given in separate installments, but on a continuous basis. Arterial pressure should be reduced from the original level by 20-25 percent, which will not cause a reduction in myocardial contractility or interfere with perfusion of the tissues. A sodium nitroprusside test is recommended for determining the optimal arterial pressure (I. K. Shkhvatsbaya, Moscow).

The Preventive Cardiology Institute of the All-Union Cardiological Center under the USSR Academy of Medical Sciences developed and successfully tested a differentiated variant of a graded model of long-term drug control of arterial hypertension under out-patient conditions. Beta-blockers are prescribed for individuals with signs of sympathetic hypertension (tachycardia, pulse pressure of over 55 mmHg, extrasystole, a positive orthostatic test, white dermographism, increased perspiration, etc.). Treatment for patients without signs of sympathetic hypertension, but with signs of hypervolemia (bradycardia, dizziness, edema, etc.) begins with thiazide diuretics (first stage). If there is no significant reduction in arterial pressure at the second stage combined use of the drugs named above or diuretics and doxepin, hymethone, or reserpine is recommended. The third stage calls for inclusion of apresin (hydralazine). Careful use of isobarin is recommended at the fourth stage. The effectiveness of this method among patients being treated regularly for relatively "stable" arterial hypertension after 12 months was 75.4 percent and among patients receiving irregular treatment, the effectiveness did not exceed 40 percent (A. N. Britov et al., Moscow).

V. I. Kharchenko et al. (Moscow) found that hypertensive patients should not be given diuretics that promote the excretion of salt when they have a combination of stable arterial hypertension and hyperkinetic blood circulation, since they have a shortage of sodium and water. V. S. Volkov and A. Ye. Tsikulin (Kalinin) propose that long-term hypotensive therapy is indicated only for individuals with marked disruption of indicators of central hemodynamics, microcirculation, and physical working capacity. In other cases of borderline arterial hypertension the advisability of drug therapy is doubtful. Ye. N. Konstantinov et al. (Moscow) determined the need to use cardiac glucosides and substances that act selectively on blood flow to the brain in hypertensive patients.

Today a great deal of attention is being devoted to non-drug treatment of hypertension. Some papers reported on the effectiveness of limiting the consumption of salt in foods, caffeine, and biologically active substances such as serotonin and tyramine, by individuals with borderline and moderate arterial hypertension (M. A. Samsonov et al., Moscow), and increasing their consumption of polyunsaturated fatty acids (N. G. Khaltayev et al., Moscow). Methods of treatment involving psychotherapy and physical therapy are becoming more and

more important (A. A. Obukhova et al., Gorkiy; N. R. Deryaga et al., Novosibirsk; V. L. Geller et al., Ivanovo).

The positive effect of various climatic factors on the course of arterial hypertension was demonstrated (S. M. Bedalova, Baku; P. I. Bey et al., Ternopol; V. G. Aliyev et al. Baku), in addition to the positive effect of therapeutic fasting (L. D. Kunitsa et al., Minsk) and physical training on a cycle ergometer (V. D. Chudimov et al., Barnaul).

Ischemic Heart Disease

Diagnosis. The report given by B. A. Sidorenko (Moscow) was devoted to the clinical aspects of early diagnosis of ischemic heart disease. In the presence of typical cardiac stenosis, 76 percent of the patients had stenotic coronary sclerosis, while stenotic coronary sclerosis was found in only 18 percent of the patients with "probable" cardiostenosis. As a rule, there is no atherosclerotic narrowing of the coronary arteries with cardialgia. In the presence of stenotic atherosclerosis of the coronary arteries that has been confirmed by coronary angiography, hypercholesterolemia was found in 81 percent of the individuals, arterial hypertension was found in 58 percent, diabetes mellitus in 10 percent, and 10 percent of the individuals were smokers. When there was no coronary atherosclerosis the first two risk factors were found in 5 and 20 percent of the individuals, respectively, and none of the individuals had diabetes mellitus or were smokers. A direct correlation was found between the number of risk factors and the presence of ischemic heart disease; therefore, when a patient has a combination of risk factors he should be examined thoroughly. At the All-Union Cardiology Center of the USSR Academy of Medical Sciences the cycle ergometer test and tests with dipyridamol and izadrine are used most extensively for early diagnosis of ischemic heart disease. The sensitivity of the cycle ergometer test is 58 percent, and the sensitivity of the dipyridamol and izadrine tests is 79 and 66 percent, respectively. The specificity of these tests is 95, 80, and 82 percent, respectively. The report indicated a direct correlation between the value of the functional classes and the incidence of false negative results on these tests. The test using nitroglycerine and echocardiographic monitoring is also an important test. In the presence of ischemic heart disease, nitroglycerine causes myocardial hypokinesia to disappear.

R. S. Karpov et al. (Tomsk) showed that typical cardiac stenosis is found in 26 percent of patients with ischemic heart disease and atypical cardiac stenosis is found in 44 percent. Thirty percent of the patients had a pain-free form of ischemic heart disease. A diagnosis of ischemic heart disease was not confirmed in 24 percent of the individuals who underwent hospital examinations. The most sensitive test was the endocardial atrial stimulation test. The other tests in decreasing order of sensitivity were: the cycle ergometer test, and the dipyridamol and novodrine tests. An ergonovine test was used to detect the spastic form of cardiac stenosis. The authors recommend the combined use of several tests for early diagnosis of ischemic heart disease, as this increases the reliability of the results. E. V. Kuleshova and L. L. Yermilova (Leningrad) used an ergometrine test for diagnosis of the spastic form of cardiac stenosis. This test was positive only in patients with attacks of acute coronary insufficiency and with cardiac stenosis both under stress and at

rest. The test was negative in individuals without any clinical indications of ischemic heart disease.

R. M. Sadkovskaya et al. (Perm) established a correlation between the level of Ca^{2+} in the plasma and the threshold of sensitivity to ergometrine. The use of Ca^{2+} antagonists led to a reduction in sensitivity to ergometrine.

According to the data obtained by A. V. Strutynskiy et al. (Moscow), the dipyridamol test was positive in 94 percent of the patients with ischemic heart disease. L. K. Badina et al. (Karaganda) diagnosed latent coronary insufficiency in 24 percent of the men and 10.5 percent of the women with an atypical pain syndrome. The cycle ergometer test is sensitive when it is used in preventive examinations (V. V. Anikin and N. I. Ivanov, Kalinin; Yu. K. Tokmachev et al., Moscow). The information provided by the cycle ergometer test increases significantly when a parallel study is made of indicators of cardiac hemodynamics and myocardial metabolism (Yu. G. Gayevskiy et al., Semipalatinsk). After studying 50 different biochemical indicators in combination with the cycle ergometer test, V. N. Popova (Moscow) developed a method for identifying pathogenetic types of metabolic insufficiencies of the myocardium. According to the data obtained by V. N. Zakharova et al. (Moscow) the study of metabolic processes in combination with the cycle ergometer test can be of prognostic use in dynamic studies.

The reports of I. I. Parkotik (Kiev), V. V. Zboromirskiy (Kiev), N. A. Andreyev et al. (Riga) contain a comparison of the results of the cycle ergometer tests and data from coronary angiography and ventriculography. V. F. Mordovin et al. (Tomsk) believe that negative results on the cycle ergometer test do not exclude the possibility of a vasospastic form of ischemic heart disease according to data from coronary angiography. The report given by V. D. Vakhlyayev et al. (Moscow) indicates that the sensitivity of the cycle ergometer test is 71.5 percent, that of the endocardial atrial stimulation test is 89.3 percent, and a study of the myocardial lactate metabolism has a sensitivity of 85 percent.

Epidemiology, Heredity. The significance of an hereditary predisposition to the development of ischemic heart disease among young people is confirmed by the fact that their fathers or mothers have an incidence of this disease that is double that among a control group and the prevalence of this disease among both parents is three times that found in the control group. The data that have been obtained confirm the hypothesis of the role of immune (HLA) disturbances in the pathogenesis of ischemic heart disease (V. A. Almazov et al., Leningrad). According to the data obtained by G. V. Tatanova et al. (Moscow) the erythrocytes of patients suffering from ischemic heart disease contain a higher level of phospholipids than cholesterol, which is due primarily to the total fraction of cardiolipids and myophosphatide acid, with a relative deficit of phosphatide choline. It has been established that among children in the risk group the incidence of disturbed glucose tolerance is higher than in the population. The early signs of dyslipoproteinemia were characterized by a drop in the plasma cholesterol level and an increase in the content of high density lipoproteins in the cholesterol (L. V. Tarnopol'skaya et al., Donetsk).

M. A. Belokon' et al. (Moscow) conducted a comprehensive study of 68 children between the ages of 8 and 16, whose fathers had experienced a myocardial infarction before the age of 45 and who had atherosclerosis of the coronary arteries that had been confirmed by data. Thirty-five percent of the children studied had 2 risk factors; 45 percent had 3 risk factors; and 20 percent had 4 or more risk factors. During the course of a single epidemiological survey of a representative sample of schoolchildren between the ages of 11 and 17 in a rayon of Moscow, I. B. Tubol et al. found a highly significant positive correlation between the atherogenicity index and systolic arterial pressure, between dyslipoproteinemia, arterial hypertension, and excess body weight.

S. V. Ruyatkin et al. (Novosibirsk) studied the role of genetic and environmental factors in the development of ischemic heart disease among native residents of Chukotka and the Altay Mountains. The research was based on the results of an earlier epidemiological survey to determine the incidence of ischemic heart disease among men between the ages of 30 and 59. The levels of cholesterol, high-density lipoproteins, and triglycerides were used as pathogenic markers of atherosclerosis in studying the pattern of hereditary predisposition to ischemic heart disease.

R. S. Ivanov et al. (Leningrad) showed that signs of coronary atherosclerosis are found more often in relatives of people who have suffered myocardial infarctions than among a control group; coronary insufficiency was detected in half of the relatives only after a cycle ergometer test. Atherosclerosis of the cerebral vessels and injury to arteries in the lower extremities were found much more frequently than in the control group. Hyperlipoproteinemia and carbohydrate metabolism disturbances were found in family members of patients who had suffered a myocardial infarction.

B. A. Koshechkin et al. (Moscow) established that the presence of cardiovascular disease in a patient's family history is a highly informative indicator of risk for ischemic heart disease. The risk for development of ischemic heart disease among men without a strong family history is 7.7, while when one of the parents had ischemic heart disease, the risk is 2.2, and when both parents and two siblings have had ischemic heart disease, the risk rises to 58.8.

Lipid metabolism. A. A. Lobanov et al. (Moscow) noted that the first clinical signs of ischemic heart disease appear at a young age considerably more frequently among individuals with hyperlipoproteinemia.

O. S. Konstantinova et al. (Moscow) showed that among women between the ages of 20 and 69 the level of total cholesterol and alpha-cholesterol was significantly higher than among men and the content of triglycerides in the blood was approximately the same.

Ye. L. Chirkova and V. I. Turchinskiy (Tomsk) found substantial differences in the levels of cholesterol, triglycerides, and alpha-cholesterol in populations from Tomsk and Moscow.

T. D. Tyabut and A. G. Mrochek (Minsk) suggested that a study be made of the lipid content of thrombocytes and erythrocytes as a more reliable indicator of

coronary atherosclerosis, than the lipid content of plasma. A decline in the stability of lipoprotein complexes serves as a definite diagnostic test and a specific risk factor for ischemic heart disease (T. V. Alyutova and N. I. Krylova, Saransk).

Hormones, immunology, and blood rheology. A correlation has been established between the clinical development of ischemic heart disease in males and the hemostatic function of the gonadotropic system (G. P. Kalinina et al., Gorkiy). Patients have increased prolactin activity, especially if they are suffering from a form of ischemic heart disease that produces arrhythmia, which among individuals with stable cardiac stenosis is subsequently replaced by an increase in luteinizing hormone. Among patients with chronic forms of ischemic heart disease and post-infarction cardiosclerosis there is an increase in the concentration of follicle-stimulating hormone. These individuals also have a decline in the basal level of T_3 and T_4 and an increase in the level of immunoreactive insulin, which leads to an increase in the levels of cholesterol, triglycerides, and fibrinogen (V. A. Dudayev et al., Moscow). It was noted that among elderly people with a reduced tolerance to carbohydrates, compared to individuals of the same age with a normal tolerance, there is a significant increase in the content of almost all the serum lipid factors, triglycerides, total cholesterol and its esters, beta-lipoproteins, and non-esterified fatty acids in men; and in women there is an increase in the estradiol level and the gonadotropic function of the hypophysis. The level of T_3 and T_4 declines, but these changes are less pronounced (V. V. Gorbachev, and M. S. Pristrom, Minsk). In patients with ischemic heart disease M. A. Dudchenko et al. (Poltava) observed a 50 percent average increase in the level of ACTH, cortisol, and insulin in the blood.

G. D. Gorb et al. (Donetsk), P. V. Baranovskiy (Ternopol), and N. V. Kanskaya et al. (Tomsk) found changes in the humoral immune system and the T-immune system. An inverse correlation was found between the quantity of T-lymphocytes and the concentration of low-density lipoproteins, which was especially pronounced at the acute stage of myocardial infarction (Kh. M. Veksler et al., Riga).

A. Shumanov (Tashkent) found circulating anti-cardiac autoantigens and autoantibodies in 75-80 percent of patients with ischemic heart disease, with higher titers among young and middle-aged individuals. M. P. Kitayev and M. I. Dvorkin (Frunze) established immunological criteria that make it possible to predict the severity of the course of ischemic heart disease.

V. V. Murashko et al. (Moscow) found during the inter-attack period of ischemic heart disease a significant increase in the content of prokallikrein in the blood and kallikrein inhibitor; at the point at which the condition becomes aggravated, these indicators decline somewhat. In patients with circulatory insufficiency there is a significant decline in these indicators.

At early stages of coronary atherosclerosis there is an increase in the level of free radicals in the erythrocytes (R. G. Sayfutdinov, Irkutsk).

A study of 123 patients suffering from ischemic heart disease showed that the morphology of circulating thrombocytes was unchanged in patients with an acute

myocardial infarction; and in the majority of patients with acute myocardial infarction the percentage of cells that split was over 50. Spontaneous aggregation was observed in 25 percent of the patients. Only 4 of 14 patients with uncomplicated cardiac stenosis had a high percentage of split forms of thrombocytes with no spontaneous aggregation of these cells (V. N. Orlov and Ye. Yu. Vasil'yeva, Moscow).

Prevention, treatment. A great deal of attention at the conference was devoted to prevention of ischemic heart disease in rural areas. According to the data obtained by P. D. Sinitsin et al. (Chelyabinsk), the incidence of ischemic heart disease among women and men in an organized rural population is approximately the same. A correlation was found between the incidence of ischemic heart disease and the level of diastolic arterial pressure, hypercholesterolemia, excess body weight, and diabetes mellitus (V. I. Kiryushkin and V. L. Yakovleva, Moscow), which should be taken into account when preventive measures are being taken. Among rice growers and tractor operators Ye. M. Agapova et al. (Krasnodar) observed hypercoagulation of the blood with simultaneous activation of fibrinolysis. A direct correlation was observed between hypercoagulation and dyslipoproteinemia. Regional consultation centers have been organized in order to improve early diagnosis of ischemic heart disease in rural areas. As a result of the operation of these centers, the number of patients with ischemic heart disease receiving clinical treatment has almost doubled. A. B. Korolenko et al. (Yalta) and T. M. Dzhahalova (Samarkand) showed that implementation of regular preventive measures helped reduce the incidence of acute forms of ischemic heart disease and the number of days of temporary incapacitation and permanent disability.

Among the men building the Baykal-Amur Mainline ischemic heart disease is encountered more frequently, which is due primarily to the presence of risk factors among this group, especially smoking and arterial hypertension (V. F. Ushakov et al., Blagoveshchensk; Yu. Ch. Badmain, Irkutsk). These same factors contribute to the development of ischemic heart disease among workers at the Ust-Ilimskiy timber industry complex (Yu. V. Zheltovskiy and M. S. Chekan, Irkutsk) and among the non-native population of Chukotka (Yu. P. Nikitin et al., Novosibirsk).

Complex multifactorial prevention of ischemic heart disease made it possible to reduce the incidence of cardiovascular diseases and the number of days of incapacitation, and delay the onset of primary disability among rail transport workers (N. A. Kudel'kina and Yu. P. Nikitin, Novosibirsk) and among workers at industrial enterprises in Tomsk (I. N. Konobeyevskaya and Ye. L. Chirkova), Zaporozhye (A. D. Vizir et al.), Odessa (Yu. N. Gordon et al.), Uzhgorod (N. I. Korabel'shchikova et al.), and Kaunas (Z. Yanushkevichyus et al.). The effectiveness of programs to prevent ischemic heart disease increases substantially when they include secondary prevention using a complex of anabolic steroids (N. V. Volkov et al., Gorkiy), trental (L. Z. Polonetskiy and Ye. S. Yatroshchenko, Minsk), hyperbaric oxygenation (S. A. Borukhov et al., Samarkand), and probucol (N. G. Kolbas' et al., Moscow). A four-week prescription for a balanced diet, taking into account basic risk factors, helped to reduce the blood cholesterol level by 26 percent, the triglyceride level by 88 percent, and excess body weight by an average of 12 kg (V. A. Meshcheryakova et al., Moscow). The paper written by L. V. Chazovoy et al.

(Moscow) contains a discussion of issues in the prevention of ischemic heart disease. Emphasis was placed on the importance of having specially trained personnel carry out the preventive measures, as well as on the need for active propaganda of medical information. With early prevention of ischemic heart disease as a goal, suggestions have been made to provide psychotherapy and correction of emotional and psychological states using drug therapy, including tranquilizers, antidepressants, and small dosages of neuroleptics (L. A. Polyakova, Moscow).

N. A. Mazur et al. (Moscow) and A. A. Sapozhnikov and K. V. Markov (Cheboksary) showed that long-term treatment with beta-blockers combined with nitrates reduces the risk of sudden death to four-thirteenths of the original degree of risk. V. V. Pekarskiy et al. (Tomsk) used temporary electrical stimulation to prevent acute circulatory disturbances in patients with arrhythmias. Inhibitory electrical stimulation in patients with ventricular tachycardia helped stabilize the hemodynamics and in a number of cases restored the sinus rhythm.

Intracardiac electrophysiological research has made it possible in approximately 80 percent of the cases to select adequate therapy for prevention of paroxysmal arrhythmias (E. O. Gimrikh et al., Tomsk).

Diagnosis and Treatment of Myocardial Infarction

A number of papers were devoted to the diagnosis and treatment of acute myocardial infarction. G. S. Voytsekhovich (Kazan) used neutral orthogonal leads to diagnose acute myocardial infarction. Ye. I. Zharov (Moscow) determined two variants of scintographic depictions of the myocardium: the focal, which is characteristic of infarctions with a large area of necrosis; and the diffuse, which is characteristic of infarctions with a small area of necrosis. In addition to this, when scanning the myocardium with ^{99m}Tc -phosphate, the increase in the area of the injured section when studied dynamically was closely correlated to the clinical signs of growing cardiac insufficiency and was a poor predictive indicator. The level of myoglobin in the serum in patients with acute myocardial infarction was significantly higher, especially when the course of the disease was complicated. This was also confirmed by G. A. Kulkybayev and R. K. Tatayeva (Alma-Ata), M. M. Uyekyula et al. (Tartu), and A. V. Bredikhin et al. (Novosibirsk).

Ya. S. Vasil'yev et al. (Tomsk) showed that serial determination of the activity of myofilament monobasic phosphate is not only one of the early criteria for the diagnosis of acute myocardial infarction, it is also an indicator of the extent of myocardial injury.

B. I. Sverdlova et al. (Kuybyshev) presented data that provide evidence of the diagnostic importance of changes in the concentration of nicotinamide coenzymes. For example, during the acute stage there is an increase in the concentration of NAD⁺ and the opposite is true for the concentration of NADP, which declines. A. N. Zakirov and R. N. Kil'debekov (Ufa) and M. V. Danilenko et al. (Lvov) recommend that levels of products of excessive lipid oxidation be used as additional criteria for evaluating the severity of acute myocardial infarction; while B. R. Rustamov et al. (Samarkand) and A. D. Kuimov et al.

(Novosibirsk) recommend that the levels of glucocorticoid hormones and insulin be used as additional criteria.

The work presented by V. A. Lyusov et al. (Moscow) indicated the effectiveness of peripheral vasodilators for treating cardiac insufficiency in patients who experienced acute myocardial infarction. In the presence of arterial hypertension and the hypokinetic form of blood circulation the authors recommend the introduction of nipride, and in the presence of normal arterial pressure and the eukinetic form of circulation they recommend isosorbide dinitrate.

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WORKING CONFERENCE OF THE ALL-RUSSIAN SOCIETY OF CARDIOLOGISTS AND ACADEMIC COUNCIL ON CARDIOVASCULAR DISEASES UNDER THE RSFSR MINISTRY OF HEALTH:
"CIRCULATORY INSUFFICIENCY AND NEW METHODS OF TREATMENT AND DIAGNOSIS IN CARDIOLOGY" (24-26 MAY 1983, KOSTROMA)

Moscow KARDIOLOGIYA in Russian No 6, Jun 84 pp 125-126

[Article by S. A. Koroleva, Moscow]

[Text] Forty papers were presented that were devoted to the diagnosis, prevention, treatment, and prognosis of acute and chronic cardiac insufficiency; lectures were given on pressing issues in cardiovascular pathology: "Unstable Cardiac Stenosis" (V. A. Almazov, Leningrad); "Diagnosis of and Differential Therapy for Hypertensive Crises" (A. S. Golikov, Moscow); "Treatment of Ischemic Heart Disease" (L. I. Ol'binskaya, Moscow); and "Treatment of Chronic Cardiac Insufficiency" (A. V. Vinogradov, Moscow).

A meeting was held of the commission on "Circulatory Insufficiency with Cardiac Arrhythmia," under the Academic Medical Council of the RSFSR Ministry of Health. In his report, A. P. Golikov, chairman of the commission, summarized the results of scientific research done in the republic on cardiac insufficiency during 1981 and 1982. Data on disturbances in the mechanical activity of separate groups of cardiac muscle in the presence of chronic circulatory insufficiency are of interest in understanding the mechanisms involved in the development of cardiac insufficiency (V. N. Fatenkov et al., Kuybyshev).

The role of hormonal dysfunctions in the pathogenesis of circulatory insufficiency and the dystrophic syndrome was described in the reports given by L. T. Pimenov (Izhevsk) and A. G. Rylova and F. I. Abazova (Moscow). Substantial endocrine disintegration was discovered, which intensified with progressive cardiac insufficiency and especially with cardiac insufficiency that did not respond to treatment. Hypersomatotropinemia with a simultaneous shortage of anabolic hormones served as a basis for successful application of anabolic hormones combined with amino acid mixtures, which was aimed at correcting protein metabolism (L. A. Leshchinskiy, Izhevsk).

Antibodies against digoxin were found in patients with cardiac insufficiency that did not respond to cardiac glycosides (I. M. Korochkin and I. A. Verbitskaya, Moscow).

A. V. Vinogradov et al. (Moscow) showed that the severity of the clinical course of myocardial infarction and the incidence of cardiac insufficiency, especially in elderly individuals, depend on the rate at which the necrotic process develops in the myocardium.

Disturbances in external respiratory functions that are tied to stress in the presence of acute coronary insufficiency, as well as to the severity of cardiac insufficiency in the process of the formation of the myocardial infarct, play a substantial role in the development of acute cardiac insufficiency with myocardial infarction (V. R. Abdrakhmanov, Moscow).

B. I. Vorob'yev et al. (Rostov on Don) believe that disturbances in the microcirculation, particularly increased permeability of pulmonary capillaries to protein and fluid, play an important role in the development of pulmonary edema. The authors propose that metabolism of the major mass of biologically active substances that increase the permeability of histohematic barriers and promote the accumulation of a protein-rich fluid in the intercellular spaces occurs in the lungs.

Emphasis was placed on the need to evaluate the type of central hemodynamics in carrying out differential therapy for cardiac insufficiency (V. I. Bobkova; V. D. Vakhlyayev et al., Moscow; G. A. Gol'dberg et al., Novokuznetsk); there was also discussion of the significance of early detection methods and methods for controlling cardiac insufficiency. Polycardiography, mechanocardiography, and radiocardiography have been recommended for evaluating myocardial contractility and the status of central hemodynamics (V. Ya. Bobylev et al., Yaroslavl); in addition to echocardiography and integral rheography (I. M. Kheynonen et al., Sverdlovsk); a method for determining the filling pressure of the left ventricle using echocardiography in conjunction with data from electrocardiography and phonocardiography (S. N. Zheltkevich and Yu. A. Khrustalev, Yaroslavl); and tetrapolar rheography combined with a cycle ergometer test (A. A. Obukhova et al., Gorkiy; A. M. Sokolov and A. Ye. Baskakova, Kostroma).

The diagnostic significance of electrocardiography plays a definite role in evaluating myocardial contractility: a horizontal depression (A. V. Vinogradov, Moscow) or elevation of the S-T segment with a measured physical load in patients with ischemic heart disease (Yu. S. Mdinradze et al., Moscow).

In the opinion of L. I. Ol'binskaya and O. A. Vartanova (Moscow) and N. I. Semenovich et al. (Moscow), in order to evaluate the effectiveness of therapy and to provide adequate corrective therapy with nitrates for patients with ischemic heart disease, it is necessary to determine the intensity and duration of their action on indicators of central and peripheral hemodynamics.

Ye. S. Geppe et al. (Moscow) presented a description of cardiomyopathies that was obtained using cardiac catheterization methods (including catheterization of the coronary sinus), angiography, and endocardial biopsy of the myocardium.

V. I. Frantsev et al. (Moscow) presented data on the expediency of transvenous endomyocardial biopsy combined with research on myocardial contractility for evaluating the heart's functional reserve.

Principles in the treatment of congestive heart failure were described in the paper presented by V. P. Pomerantsev (Moscow): increasing the heart's pumping function, decreasing the hemodynamic load on the myocardium, treating the primary disease, eliminating aggravating and contributing factors, decreasing physical activity, decreasing the exchange of circulating blood, primarily by means of a negative sodium balance, evaluating the status of central hemodynamics, and identifying indications for the use of cardiac glucosides.

It has been established that vasodilators are very effective in the treatment of cardiac insufficiency with long-term use of long-acting nitrates on an out-patient basis (Ya. I. Kots, Orenburg); also effective are alpha-adrenergic blockers (tropaphen, phentolamin), L-dopa, apressina, and especially combinations of these drugs (Ye. N. Dormidontov et al., Yaroslavl), when vasodilators are combined with drugs that improve the rheological properties of the blood and microcirculation (V. V. Murashko et al., Moscow; T. R. Petrova et al., Krasnodar), when nitroglycerin or sodium nitroprusside is used to treat patients with acute myocardial infarction (A. P. Golikov et al., Moscow; V. D. Vakhlyayev et al., Moscow; V. A. Lyusov et al., Moscow; V. I. Bobkova et al., Moscow; I. M. Kheynonen et al., Sverdlovsk).

In the reports given by M. Yu. Bal et al. (Voronezh) and N. B. Perepech (Leningrad), methods were presented for predicting cardiac insufficiency in the presence of acute myocardial infarction, which offer evidence that indicators of central hemodynamics combined with an evaluation of the size of the infarct and clinical observations are very informative in providing a prognosis.

The report given by I. V. Landysheva (Blagoveshchensk) described specific aspects of the development of circulatory insufficiency in patients with chronic nonspecific pulmonary diseases under the influence of low temperatures in northern parts of the Amur region.

Data were presented on the role of the activity of the kinin system in the genesis of arterial hypertension (Yu. A. Panfilov et al., Kuybyshev), on the possibility of effective, controlled treatment of arterial hypertension among an organized group of workers and workers in the Vladivostok ship repair industry (R. T. Libenzon et al.), and on the possibility of a standardized evaluation of the condition of individuals with hypertension for monitoring the effectiveness of hypotensive therapy (B. G. Bershadskiy et al., Leningrad).

Long-term recording of EKG's using various methods, primarily halter monitoring (V. L. Doshchitsin et al., Leningrad), is of great value in the diagnosis of cardiac arrhythmias. In order to clarify the nature of the pathology of the sinus node and the sino-atrial node in the presence of the weak sinus node syndrome, a multidimensional study must be made, including an atropine test with a measured physical load and daily EKG monitoring (A. S. Smetnev and G. V. Grudtsyn, Moscow).

Of definite importance are methods that involve occlusive plethysmography for evaluating the pharmacodynamic effect of vasoactive drugs (V. S. Volkov et al., Kalinin), evaluation of the functional status of the myocardium taking into account metabolic changes in the wall of the left ventricle using data from echocardiography (F. Ye. Ostapyuk and A. G. Avtandilov, Moscow), polycardiography on patients with hypertrophic obstructive cardiomyopathy after the introduction of amyl nitrate or nitroglycerine (S. I. Yakimenko, Leningrad), and echocardiographic research on the phase structure during diastole using computer graphic analysis (V. Yu. Styazhkin and A. V. Sumarokov, Moscow).

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SOVIET BIOCHEMISTRY ADVANCES SURVEYED AT CONFERENCE OPENING

Moscow MEDITSINSKAYA GAZETA in Russian 27 Jun 84 p 1

SAKHANOVSKAYA, M. and LIKHOLITOV, V.

[Abstract] The article is a report of a press conference for journalists which was held on the opening day of the 16th Conference of the Federation of European Biochemical Societies. At the press conference, prominent scientists commented on the present-day status of biochemistry and contributions which Soviet scientists have made recently to its advancement. Among the speakers were Yu. A. Ovchinnikov, vice-president of the USSR Academy of Sciences and chairman of the conference; Academician S. Ye. Severin, president of the All-Union Biochemical Society and vice-president of the conference's organizing committee; A. A. Bayev and P. G. Kostyuk, members of the presidium of the USSR Academy of Sciences; and V. F. Bystrov, corresponding member of the USSR Academy of Sciences and general secretary of the conference.

Ovchinnikov mentioned a number of directions in which biochemists have made important advances, particularly molecular biology and biophysics, genetic engineering, immunochemistry, cell-membrane bioenergetics and the study of hormones and superhormones, including neuropeptides. He mentioned that biochemical research of human higher nervous activity is leading to the solution of a number of extremely complex questions connected with memory, pain and sleep. Schools of Soviet biomembranologists have earned wide renown for their studies of membrane proteins and the role of the calcium transport system in the functioning of nerve cells.

The following works received special mention as pioneer accomplishments in key directions of biochemistry: research of the genetic apparatus of eukaryotes by G. P. Georgiyev, corresponding member of the USSR Academy of Sciences; work in the field of genetic engineering by academician A. A. Bayev; basic research of the transmission, on the translation level, of hereditary information in cells by academician A. S. Spirin and others; and interpretation, using genetic-engineering methods, of the structure of the enzyme DNA-directed RNA polymerase from the colon bacillus at the USSR Academy of Sciences' Institute of Bioorganic Chemistry imeni Shemyakin. Ovchinnikov noted that work of exceptional merit on the development of artificial vaccines is being pursued jointly by R. V. Petrov, member of the USSR Academy of Medical Sciences, and V. A. Kabanov, corresponding member of the USSR Academy of Sciences.

Kostyuk mentioned some of the main problems of present-day neurophysiology, neurobiology and the new direction of molecular physiology. Specialists are investigating the molecular makeup of different types of nerve cells and the possibility of influencing certain functions by producing effects on complex molecules of these cells. Neurobiologists reportedly have taken the first steps toward identifying, on the molecular level, processes on which attributes such as memory are based.

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SCIENTIFIC ACTIVITY OF ARMENIAN ORDER OF RED BANNER OF LABOR SCIENTIFIC RESEARCH INSTITUTE OF EPIDEMIOLOGY, VIROLOGY AND MEDICAL PARASITOLOGY IMENI A. B. ALEKSANYAN (FOR THE 60TH ANNIVERSARY OF THE FOUNDATION OF THIS INSTITUTE)

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 2, Feb 84, excerpts from pp 114-117

[Excerpts, article "Scientific Activity of the Armenian Order of Red Banner of Labor of the Scientific Research Institute of Epidemiology, Virology and Medical Parasitology Imeni A. B. Aleksanyan, by K. M. Dekhtsunyan]

[Excerpt] In 1955, the Institute of Malaria and Medical Parasitology and the Institute of Epidemiology, Microbiology and Hygiene were consolidated into the Scientific Research Institute of Epidemiology and Hygiene. In 1971, after the hygienic laboratories were removed from the institute, it was named the "Institute of Epidemiology, Virology and Medical Parasitology imeni A. B. Aleksanyan".

The epidemiological laboratory (directed by Doctor of Medical Sciences G. B. Gukasyan) is one of the oldest sections of the institute. The fundamental nature of its scientific research has resulted from the needs of practical health care of this republic, for example, epidemiological characteristics of intestinal infections (typhoid fever, paratyphoid, dysentery, salmonellosis, viral hepatitis) and the development of efficient measures for treatment and prophylaxis (V. G. Mikaelyan, V. A. Aleksanyan, A. S. Galstyan, G. B. Gukasyan, A. Y. Mkrtichyan, I. A. Tonoyan, et al.).

Under the direction of A. B. Aleksanyan, the laboratory has developed methods to combat diphtheria and its prophylaxis. As a result, this infection was eliminated practically everywhere in this republic by 1970 (the intensive method of prophylactic vaccinations, proposed by the author). In recent years, this laboratory has been studying the immunological effectiveness of ADS anatoxin with a decreased anatoxin content (A. V. Tatevosyan, Y. V. Manvelyan). The data collected are the basis for the development of a mathematical model, which predicts antitoxic immunity to diphtheria and tetanus.

Previously, the laboratory studied epidemiological characteristics of whooping cough (A. M. Arutyunyan) and brucellosis (F. A. Tsaturyan). For the first time in this republic, natural foci of leptospirosis were detected (S. V. Rostomyan). For 40 years, Professor V. A. Aleksanyan has devoted a large

amount of work to determining the epidemiological geography of infectious in Armenia. Results of many years of research aided practical health care organs in conducting effective, scientifically-grounded measures to combat and prevent different infectious diseases in various geographic zones.

Over the past 10 years, intensive research has been conducted on salmonellos which greatly harm the national economy of this republic. The development and perfection of methods for the diagnosis and preventive treatment of salmonellos has reduced the incidence of illness caused by this infection (G. B. Gukasyan, I. A. Tonoyan).

The laboratory of viral infections (directed by Candidate in Medical Sciences V. G. Vartapetyan) has studied the epidemiology, diagnosis, virology and methods to combat such viral infections as rabies, poliomyelitis, arboviral infections and rickettsia (V. A. Avetisyan, M. Y. Kotsinyan, O. V. Bondarenko et al.).

This laboratory researchs influenza and other serious respiratory diseases of viral etiology, controls circulation of viruses and the condition of the collective immunity, which has enabled them to determine the etiology of outbreaks of influenza and influenza-like diseases, and determines the direction of epidemiological control measures in the particular conditions of this republic (V. A. Avetisyan, 1972; 1973; B. G. Vartapetyan, Y. A. Vantsyan).

The circulation of adenoviruses of serum types 1, 2, 3, 4, 5, 6 and 7 was determined for the territory of Armenia and their role in the etiology of outbreaks of influenza-like diseases and conjunctivitis was revealed (V. G. Vartapetyan, 1974).

The lab has studied reactogenicity, immunogenicity and epidemiological effectiveness of a series of native skin vaccines. The living skin vaccine L-16 (A. V. Zakaryan) was recommended for mass vaccination. A great amount of research has been devoted to the study of epidemiological characteristics of the skin in the period of mass vaccinations and the study of the duration and intensity of post-vaccination immunity of the child population of this republic and the causes of disease of the skin of vaccinated children (A. V. Zakaryan, A. S. Danilov, S. A. Mashuryan, 1976, 1981).

During the investigation of the presence of psittacosis in Armenia, the source of psittacotic infection was discovered, the presence of infection in the population was determined and the relative share of psittacotic infection in the etiology of obscure high-fever diseases was established (S. A. Shahnazaryan, 1976). Research has been conducted to determine the reactogenicity and immunogenicity of the tablet-form variola vaccine. An analysis of data has shown that oral immunization of 15-16 year-old youngsters with tablets of the anti-variola vaccine does not yield to the cutaneous vaccine in effectiveness (T. A. Arakelyan, 1981). In the territory of Armenia, 10 types of arboviruses have been divided for various geographic zones, including the viruses [of] Tamdy, KGL [expansion unknown], Tyaginya and Zovashen, of which the latter is new to science. A serologic search was conducted for the presence of antibodies to arboviruses of agricultural animals and in occupational groups of the population (V. A. Zakaryan, S. A. Shakhnazaryan, V. A. Avetisyan et al., 1980, 1981).

Since 1980, research has been conducted in the laboratory on viral hepatitis, the development of various immunological tests for differential diagnosis and early exposure of patients in the seat of infection, and the immune structure of the population in relation to viruses of hepatitis A and B have been studied. The relative incidence of diseases caused by the B virus among all viral hepatitis diseases has been determined.

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INSTITUTE OF BIOORGANIC CHEMISTRY IN NOVOSIBIRSK

Moscow MOSKOVSKAYA PRAVDA in Russian 30 Jun 84 p 1

[Text] Novosibirsk--The scope of scientific undertakings has been broadened at the Siberian branch of the USSR Academy of Sciences. An institute of bioorganic chemistry has opened in Academy City. The main efforts of this institute's staff will be aimed at developing a theory and methods of producing effects on biological molecules.

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URGENT PROBLEMS OF FORENSIC MEDICAL SERVICE IN LIGHT OF DECISIONS OF JUNE (1983) AND DECEMBER (1983) PLENUMS OF CC CPSU

Moscow SUDEBNO-MEDITSINSKAYA EKSPERTIZA in Russian No 2, Apr-May-Jun 84
pp 3-6

[Article by A. P. Gromov and I. Ye. Panov of the Scientific Research Institute of Forensic Medicine (Director--Corresponding Member of the USSR Academy of Medical Sciences, A. P. Gromov) of the USSR Ministry of Health]

[Text] The decisions of the June (1983) and December (1983) Plenums of the CPSU Central Committee entered the life of our party and people as an urgent program drive for the achievement of new frontiers in the economic and social development of our Motherland.

The Soviet people are reviewing the materials of the Plenums as a striking display of the Lenin approach on the part of the CPSU to the solution of the urgent problems in the modern stage of Soviet social development; they are also examining the concern of the party for the Soviet man, his material well-being and spiritual development, the basic improvement of international relations, and the strengthening of peace on earth.

At the December (1983) Plenum of the CPSU Central Committee the importance of the following problem was stressed particularly: to maintain the accelerated tempo, and at the same time make a good start from the very first days of 1984 and widely extend socialist competition in order to ensure the unconditional fulfillment of the planned goals and use all means for their over-fulfillment. Main emphasis should be placed on clear-cut organization of all work, acceleration of scientific-technical progress, and more complete utilization of industrial potential and of all material, labor and financial resources. Additional reserves should be sought more persistently and utilized more completely, above-planned target growth of labor productivity should be attained as well as cost reduction and the strengthening of economic conditions in each organization. The Soviet people should be mobilized for the solution of key national-economic and social-political problems, and the consciousness and political culture of the working people should be developed daily.

In light of the decisions of the June (1983) and December (1983) Plenums of the CPSU Central Committee the forensic medicine service is facing important

and responsible goals. The ways and means for further improvement of production indicators should be determined, first of all, by more complete utilization of the intensive growth factors and additional reserves; everything should be done also to further improve the quality of forensic medicine expert opinion and to reduce the time it requires.

The work results of the forensic medicine service in 1983 are a good basis for the implementation of measures to carry out its worthwhile goals. Much organizational, political-educational and economic work has been done, as a result of which the organizational work of the forensic medicine expert opinion bureaus has improved, the material-technical base has been consolidated, the professional training level of key personnel has improved, the quality of expert opinion has grown, new investigative methods have been introduced into practice, and cooperation has been developing between the law and order and the health service bodies. The achievement of these results has been promoted by the extensive and single-minded work of the USSR Ministry of Health, the Scientific Research Institute of Forensic Medicine, and the local administrators of forensic medicine expert opinion institutions.

For purpose of further intensification of work of the forensic medicine expert opinion bureaus and improvement of the quality and efficiency of expert opinion, the Scientific Research Institute of Forensic Medicine has worked out new Rules for the organization and production of forensic medicine expert opinion on a dead body and has given these Rules to the USSR Ministry of Health for approval; the Institute has also prepared drafts of new Rules for the organization and production of forensic medicine expert opinion according to the materials of a case and the forensic-chemical examination of material evidence, and is completing the drafting of new Rules for forensic medicine expert opinion on material evidence, as well as a number of circular, methodical and informational documents. The systematic inspections of the state of forensic medicine expert opinion, conducted by the Institute in individual union republics with subsequent publishing of corresponding informational letters, enables identification of operational work deficiencies and the taking of measures to eliminate them, as well as wide dissemination of advanced know-how in other union republics. At the present time, analysis and generalization of the work of forensic medicine laboratories is being carried out at the Institute; this will enable implementation, as early as 1985, of a number of specific measures on the further intensification and improvement of efficiency in the laboratories. The annual conferences, organized by the Institute, of chief forensic medicine experts from the Ministries of Health of the union republics with subsequent implementation of the accepted measures on real problems of expert opinion practice, are of great importance for all the forensic medicine service.

A course on intensification of work and improvement of work quality and efficiency is conducted in all forensic medicine expert opinion bureaus. Substantial successes have been attained by many bureaus of the Russian Federation, the Ukrainian, Belorussian, Kazakh, Latvian, Lithuanian, Moldavian, Tajik and Estonian SSR. On the whole, the work quality of forensic medicine institutions in Azerbaijan, Armenian, Georgian, Kirghiz, Turkmen and Uzbek SSR has grown markedly. The strengthening of leadership locally and the

taking, by the Scientific Research Institute of Forensic Medicine, of the forensic medicine service work under special control in the individual union republics have contributed to improved work quality.

However, what has been done should not be overestimated. There is much to be done in eliminating the existing deficiencies in the forensic medicine expert opinion bureaus. The operational activity of forensic medicine bureau administrators, socialist competition, the economic, organization, ideological-educational work of the party, and the trade union and komsomol organizations of the forensic medicine expert opinion institutions should have as their purpose the progressive and persistent continuation of the line for maximum improvement of production efficiency and achievement of high end results.

First and foremost, problems of management and improvement of the entire operational mechanism are coming to the fore. Time commands this because the continuous progress of production, science, technology and culture places new problems before management and demands its continuous improvement, creative research, judicious experiments as well as organizational and psychological reorientation.

In accordance with the recommendations of the Second All-Union Conference of Forensic Physicians of the Main Forensic Medicine Expert Opinions [Bureaus], comprehensive long-term plans for the social development of forensic medicine service have been worked out in the union republics for 1984-1990 as well as plans for the postgraduate training of personnel. A special check of these plans revealed that they do not provide for all the available means, techniques and methods that enable the attainment of best results with the least expenditure of manpower, nor do they utilize all available reserves. The real problems of operational, administrative, organizational, practical and preventive work are not taken into consideration; the main key directions of activity are not clearly defined; many of the planned measures are of a nonspecific and nonconstructive nature; implementation time periods are not designated for all measures nor persons responsible for them; and, high quality implementation of some measures does not appear possible in the suggested time periods.

The plans should be reworked and refined including, first of all, all those measures whose implementation is urgently required by actual conditions. And, the knotty problems of development should not be adapted to the conditions formed at the bureaus, but should be aimed at moving forward rapidly. Also, it is essential to provide measures for a comprehensive, advanced mechanism of management that ensures well organized, smoothly flowing work in all structural subdivisions, utilizing the material and labor resources and available reserves. A climate of very exacting demands and high efficiency, uncompromising and strict in regard to inefficiencies and oversights, should be created in all forensic medicine expert opinion bureaus. Further implementation of the solutions of the CC CPSU, USSR Council of Ministers and the All-Union Central Trade Union Council on "Intensification of Work for Strengthening Socialist Discipline of Labor" is of greatest importance for putting these goals into practice.

The urgent problem of perfecting the organizational structure of management on all levels and in all links of forensic medicine service includes a greater role and importance for the republic forensic medicine expert opinion bureaus in the planned development, organization and coordination of the work of all service subdivisions in a republic, as well as implementation of production activity control. The republic bureaus should become the real headquarters for forensic medicine expert opinion in the respective union republics. For this purpose, they should carry out in full measure the functions imposed on them, and decisively eliminate such occurrences as formalism and banality; they should develop a creative relationship between the personnel and the assigned tasks. Inactivity and the striving for imaginary well-being should receive a critical rating, based on principle, from the party and trade union organizations.

The forensic medicine laboratories of the republic bureaus should be organizational-methodical centers of their respective subdivisions. Apart from complex repetitive expert opinions, the laboratory goals should include the continuous incorporation into practice of new types and methods of laboratory investigations, wide dissemination of advanced know-how, improvement of the subject qualifications of experts by conducting specific subject seminars, and a provision for further development of forensic medicine and forensic chemistry expert opinions at local bases in the republics.

Perfecting the selection of personnel on the basis of subject and political qualifications and training the true organizers of forensic medicine expert opinion, the ones who are full of initiative and are capable experts, are of great importance. The work should be activated, with a reserve for administrative position replacement, combining a goodwill attitude with high demands and principles.

The correct organization and coordination of the work of forensic medicine expert opinion institutions locally depend largely on the improvement of performance control. In many ways the end result of all work depends on how successfully the basic units of the forensic medicine service manage with their jobs--the rayon, interrayon and city expert opinion bureaus. For this reason, the control of their work should be clear-cut, continuous and effective.

Local visits, which study the state of affairs and develop constructive measures to eliminate deficiencies and utilize potential reserves, are an effective form of control. In the course of each work check, assistance should be given to improve organization and work conditions.

The dissemination of advanced know-how holds an important place in a number of organizational measures. Prompt notice should be taken of everything new and useful, the best forms and methods of work should be widely incorporated into practice, and the undertakings of the front rank workers and innovators should be supported with methodically feasible organizational, economic and moral measures. Incorporation of advanced know-how may be carried out by conducting seminars, and preparing letters, reviews and methodical recommendations. A large role in the operational incorporation of advanced know-how is played by socialist competition, whose organization should be rebuilt in

accordance with the new demands. In evaluating socialist competition results, the main attention should not be focused so much on the quantitative work indicators as on quality improvement and time reduction of expert opinion production, improved utilization of production power, and saving of material resources. One must remember that socialist competition is an effective means of improving the consciousness of labor and cultivating a feeling of collectivism in labor as well as high social ideals. Therefore, the continuous perfection of socialist competition is the clear duty of party organizations, administrators, and every communist of forensic medicine expert opinion institutions.

Measures have to be taken for more practical incorporation of medical science achievements into the practice of expert opinion. It should be noted that serious attention is given to this matter in the overwhelming majority of union republics. The methodical instructions, recommendations and informational letters, issued by the Scientific Research Institute of Forensic Medicine, are promptly used in the work, specific subject seminars are conducted, and experts are trained in new investigative methods at institutes for the advancement of doctors, on the job in the Scientific Research Institute of Forensic Medicine and at large bureaus of forensic medicine expert opinion. However, in individual bureaus the significance of this important work is not properly understood. Often, even with the availability of the necessary technical base and trained experts, the recommended new methods of investigation are incorporated into practice with considerable delay. Micromethods, which enable the investigations of very small objects, are not sufficiently widely used nor are methods of quantitative and semiquantitative evaluation. Not all the authors of completed scientific investigations rush to put their data into effect. Drafts of methodical documents, received by the Scientific Research Institute of Forensic Medicine, often do not meet requirements and, for this reason are returned for reworking. The approval time period for new investigative methods in forensic medicine bureaus often exceeds the established time periods.

Elimination of the mentioned deficiencies will enable to improve the scientific validity, quality and efficiency of forensic medicine expert opinions and to reduce their production time.

The close relationship of ideological work to the solution of various daily matters has always been at the center of the party's attention. The materials of the June (1983) Plenum of the CPSU Central Committee stress particularly the fact that the ideological, mass-political work is moving increasingly to the foreground, and its role and importance are growing as well. This position is also of paramount importance for specialists in the field of forensic medicine, which represents one of the greatest party disciplines in medical science.

Life makes increasingly higher demands on the general education and professional training of forensic medicine experts, their political and economic culture, and their moral and ethical upbringing. A thorough mastery of Marxism-Leninism, its method and basic principles, ideological conviction, and continuous work on improving one's ideological-political level are essential for a forensic medicine expert; these are important not only for

the elucidation of the meaning of the processes and events of social life from class and party positions, but for the correct solution of the complex problems of professional activity as well. The development of these qualities in workers of the forensic medicine service, the cultivation of Soviet patriotism, the need of honest labor for the well-being of society, creative activity, initiative and communist morals should be the focus of attention for administrators of forensic medicine expert opinion institutions, trade union and komsomol organizations, and the All-Union Scientific Society of Forensic Physicians. The leading role in this struggle should be played by members of the Lenin party, who by their selfless labor and moral example, their organized nature and business-like characters, and irreconcilability toward laxity and any displays of private party psychology or consumer attitude toward life, should serve as an example for all employees of the forensic medicine expert opinion bureaus.

The Law of the Union of Soviet Socialist Republics on labor collectives and the increasing of their role in the management of enterprises, institutions, and organizations opens up for the forensic medicine expert opinion bureaus, each forensic medicine expert, and the middle and junior medical workers new horizons for the application of creative powers and the display of capabilities, energy and work enthusiasm. The problem is to ensure a wide use of the Law and to use the great potentialities of the labor collective to the maximum as an instiller of moral force against violators of the socialist way of life. The problem is particularly serious in regard to eradication of hard drinking, money grubbing, misappropriation of public property, bribe taking, careless attitude toward work, and absenteeism. To see in these ugly occurrences only relics of the past--means to consciously run away from the necessity of identifying and eliminating the conditions that give rise to these occurrences. In the struggle against negative occurrences it is essential to correctly combine measures of an economic, educational, organizational and judicial type. Party organizations and administrators of forensic medicine expert opinion bureaus should be guided by the power of public opinion, and the influence of labor collectives; and, those administrators who are still dealing with negative occurrences should use proper measures.

Special attention should be focused on the moral-ethical aspect of the work of forensic medicine experts. Their actions and deeds should be beyond moral reproach. Displays of callousness, hard-heartedness, indifference, proof of hurting anyone's self-respect and other violations of professional ethics should be overcome in a most decisive manner. Each warning or formal statement regarding a petty detail attitude toward a case or the improper carrying out of forensic medicine expert opinion should be reviewed promptly and comprehensively, and the necessary measures should be taken.

The June (1983) Plenum of the CPSU Central Committee placed before the Soviet health service a large-scale problem--to improve the quality of therapeutic-preventive care by introducing an annual clinical examination for all the population. The decision of the Plenum is still another striking display of the constant concern of the party for improving the health and well-being of the Soviet people. The solution of this problem will enable us to strengthen the health of Soviet citizens, identify diseases at early stages, and prevent their development. The forensic medicine experts should also participate in the realization of this solution.

The following is far from a complete listing of ways that forensic medicine experts may feasibly participate in the work of improving clinical examinations and strengthening the health of the Soviet people; systematic generalization of materials comparing diagnoses during life and post-mortem; identification of reasons for nondiagnosis of diseases and pathological states; discovery of gross errors during the giving of therapeutic-preventive care; systematic conducting of forensic medicine clinical-anatomic conferences; a serious, purposeful analysis of traumatism cases, poisonings, sudden death and others for the purpose of developing more effective proposals for their prevention; and activation of work on hygiene education for the population, publicity for a healthy life style, and, a drive against alcohol abuse and other harmful habits.

The decisions of the June (1983) and December (1983) Plenums of the CPSU Central Committee are an urgent program drive of the party and all the Soviet people. There is no doubt that the forensic medicine service collective of the country, which fervently approves of the Plenum decisions, will apply all efforts to the successful carrying out of the set goals and the attainment of new successes in communist building.

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DEVELOPMENT AND PERFECTION OF COORDINATION OF SCIENTIFIC AND PRACTICAL ACTIVITY
IN LEGAL EXPERT OPINION INSTITUTIONS

Moscow SUDEBNO-MEDITSINSKAYA EKSPERTIZA in Russian No 2, Apr-May-Jun 84
(manuscript received 20 Oct 83) pp 7-9

[Article by A. R. Shlyakhov and M. N. Rostov of the All-Union Scientific Research Institute of Legal Expert Opinion (Director--Doctor of Jurisprudence, A. R. Shlyakhov) of the USSR Ministry of Justice, Moscow; received 20 Oct 83]

[Text] The decisions of the 26th Congress of the CPSU and the resolutions of the November (1982), June (1983) and February (1984) Plenums of the CPSU Central Committee make the criminal experts and the legal experts responsible for intensifying the search for new ways of using extensively the achievements of scientific-technical progress in expert opinion practice; the purposes of these ways should be the successful uncovering, investigation and prevention of crimes as well as the establishment of objective truth in every criminal and civil case.

Experience shows that in our country the improved efficiency of legal expert opinion depends largely on the cooperation of the state legal expert opinion institutions. The joining of their efforts will raise the level and quality of their scientific, expert and preventive activities.

Complicated problems, whose solution requires comprehensive expert study by specialists in various branches of knowledge, appear in investigatory and legal practice. Often, the complicated problems are successfully solved only with the joint efforts of criminal experts, forensic physicians, expert automobile technicians, and representatives of other specialized branches of knowledge. Only comprehensive expert investigations enable the reconstruction of actions of persons at the moment the crime was committed; enable the determination of the relative locations of person shooting (attacker) and victim at the moment of shooting (cause of wound), number of injuries (wounds) and the order in which they occurred; enable the establishment of evidence of contact interaction between clothing of the accused and that of the victim (as well as transport means of the victim), type (shape, size) of weapon, with which injuries were inflicted on clothing and body of victim; enable the reliable identification of the crime weapon; enable the establishment and identification of the specific source of origin of evidence objects, destruction mechanism of object, and causes of fire and its development in

time and space. At the same time complicated expert opinion problems often remain unsolved or only partially solved when separate investigations are carried out. Thus, one of the basic modern trends in legal expert opinion development is the joining of knowledge and the experience and efforts of representatives of various scientific disciplines for the study of the sum total of properties of evidence objects and bringing together the diverse information to solve complicated, integrated problems.

Unfortunately, the modern potentialities of legal expert opinion are not fully utilized. This is largely caused by a certain fragmentation in the practical and scientific activities of the different legal expert opinion institutions.

In scientific-methodical work the criminal experts and forensic physicians do not have sufficient contact with the investigators and lawyers. Also, there is practically no cooperation in the development of preventive measures.

The need for comprehensive cooperation between legal expert opinion institutions, irrespective of the department they belong to, is stipulated by the general interdependence of evidence objects, generality of scientific methods of investigation, and unity of purpose. Of course, the coordination of these institutions assumes consideration of the specificity of their goals and functions as well as the actual potentialities of technology and personnel.

The problem of cooperation and its coordination assumes a special urgency because of the heavy flow process of information volume growth dealing with an infinite variety of objective reality. It is difficult to envision the outlook for the growth volume of scientific information, but the predictions are such: in 1985 the volume of scientific information will increase by 5 times compared to 1965, and in the year 2000 will increase by 14.5 times. By the year 2000 the quantity of officially transmitted scientific information will reach 57.5 million documents a year*.

The rapid growth of information is seen in the field of legal expert opinion as well. For this reason, even at this time measures should be taken to find principally new ways of processing, storing, supplementing and updating information as well as ways of its rapid retrieval by experts and scientific workers.

True, it has been conjectured that reality will be differentiated so much by its regularities that the knowledge of these regularities will distance scientists from each other; researchers will be increasingly locked into their own narrow field of knowledge and will become "deaf" in any personal contact with each other**. Of course, this very pessimistic conjecture is controversial. However, the differentiation and continuous fractionation of scientific knowledge is not controversial. A search for the solution to this problem is going on in the general philosophical and science management studies.

* Kogan, V. Z. Chelovek v potoke informatsii [Man in a Flood of Information], Novosibirsk, 1981, p 2.

** Nauka v sotsial'nykh, gnoseologicheskikh i tsennostnykh aspektakh [Social, Gnoseological and Value Aspects of Science], Moscow, 1980, p 46.

The practical measures for uniting the forces and means and the coordination of efforts of the representatives of different branches of knowledge reflect the objective need for the development of scientific research and efficiency improvement of modern science.

The cooperation of legal expert opinion institutions, irrespective of their specific character, is essential and feasible in all spheres of legal expert opinion activity: production of expert opinions; study and generalization of investigatory, legal and expert opinion practice; and, the development of preventive measures, scientific-research and scientific-methodical work.

Necessity for cooperation in practical expert activity is determined primarily by the development of complex investigations that are known to have appeared in expert practice long ago. However, complex expert opinion as a form of complex investigation has existed without standardized control for many years. In 1982 Instructions on the organization of complex expert opinion production in the legal expert opinion institutions of the USSR Ministry of Justice and the USSR Ministry of Health were put into effect for the first time. Meanwhile, the practice is raising questions that require further development of the problem of complex expert investigations.

The specialization of experts is unavoidably becoming increasingly more narrow under the conditions of deepening differentiation of scientific knowledge. Investigators and judges do not have any official information on the professional training and qualifications of experts. The All-Union Scientific Research Institute of Legal Expert Opinion has allocated money for information on the distribution and competence of the legal expert opinion institutions of the USSR Ministry of Justice, but this is still insufficient funding for information on the different kinds and types of expert opinions. An earlier suggestion was to publish lists of experts which would give information on their competency (professional training and qualifications). The need for publication of such lists at the present time, in a period of complex investigation development, is becoming increasingly more urgent since the investigators and judges have to know the operational staffs of all legal expert opinion institutions of the republics, oblasts (krays) and cities. This will contribute to the correct assignment of difficult, complex, repeated expert opinions and the successful solution of complicated expert problems. The scientific-research institutes of the legal expert opinion laboratories should take the initiative and head the work on preparation of lists of experts, including those persons working in branch scientific research institutes and who are sometimes recruited for conducting expert investigations.

The cooperation of legal expert opinion institutions in the study of investigatory-legal and expert practice materials would provide for the development of comprehensive proposals on the prevention of crime against the life and health of citizens. The problem is to organize a systematic study of circumstances, conducive to the committing of crimes, for the purpose of developing organizational and scientific-technical measures for their prevention.

Scientific research and experimental work also demands a strengthening of cooperation between the legal expert opinion institutions. To do this, coordination is essential, first of all, to avoid unnecessary parallelism and to

achieve a rational distribution of forces and means and, secondly, to unite the efforts of several collectives for joint development of the more urgent problems of legal expert opinion.

Interdisciplinary integration, displayed in the establishment and development of systematic and complex investigations, and attempts to formalize and mathematize knowledge are an objective necessity, determined by the demands of practice. Cooperation is essential for developing unified methodological and theoretical principles, which should serve as the basis of special methods and systems of complex investigations for the solution of integrated problems of boundary questions for the different kinds (types) of legal expert opinions. In 1982 the All-Union Scientific Research Institute of Legal Expert Opinion of the Ministry of Justice and the Scientific Research Institute of Forensic Medicine of the USSR Ministry of Health conducted joint scientific research work in the area of the legal bases of complex investigations and the theoretical and methodical aspects of complex investigations for the purpose of establishing contact interaction of a crime weapon with the clothing and body of the victim. In 1983 the volume of joint scientific research did not change substantially.

In 1983 the associates of the All-Union Scientific Research Institute of Legal Expert Opinion started a scientific research work project whose purpose, specifically, is to produce an automated information retrieval system on legal expert opinion subjects as well as to develop scientific bases and principles for the automated solution of expert problems (subproblems). Joining of the scientific forces of criminal experts and forensic physicians would, undoubtedly, contribute to the successful attainment of these goals.

Criminal experts and forensic physicians have successfully worked together in developing a dictionary of basic terms for forensic medicine expert opinions. This collaboration should be strengthened and intensified for the task of producing an encyclopedic dictionary which will contain terminology and concepts for all classes, kinds and types of legal expert opinion.

Cooperation in use of equipment and apparatuses. Scientific research institutes (laboratories) of legal expert opinion and bureaus of forensic medicine expert opinion have at their disposal different instrument bases. Not all these institutions have well equipped physical and chemical-biological subdivisions. Thus, there is a problem of more rational use of equipment and instruments, primarily of expensive and complex equipment. One should bear in mind that modern technology becomes obsolete in 7-8 years, and in 15 years practically complete technological reequipment takes place. Development of a general plan for the replacement of total equipment and instruments in legal expert opinion institutions, providing for their relatively uniform distribution over the rayons, oblasts and krais, would be helpful. The development of a Position on conditions of reciprocal use of laboratory technology in legal expert opinion institutions of the USSR Ministry of Justice and the USSR Ministry of Health appears expedient.

Coordination of cooperation in training and advancing the qualifications of expert personnel. In the legal expert opinion institutions of the USSR Ministry of Justice special attention is devoted to the training and retraining of experts, who have a natural science or technical education.

The training program of these specialists includes subjects on the scientific bases and principles of criminalistics, theory of legal evidence, theory of legal expert opinion, and criminal law and process. This is essential because a criminal law expert is responsible for establishing factual data as well as for determining their cause-effect relationship to the investigated event.

A proposal on the organization of special training for experts, recruited for producing complex medical-criminalistic legal opinions was offered at the All-Union Conference for incorporation of scientific methods and recommendations into investigative-legal practice (November 1977). A criminal expert should have training in the area of forensic medicine expert opinion, and a forensic physician should have knowledge of criminal law.

For criminal experts and forensic physicians a study of methods for complex investigations of real evidence should be organized. The development of unified programs is expedient for the training of experts; such training may be conducted at institutes for the advanced training of physicians or as correspondence courses by experts at the All-Union Scientific Research Institute of Legal Expert Opinion of the USSR Ministry of Health.

The activity of legal expert opinion institutions should be coordinated at all levels. The organization of coordinative councils on problems of criminalistics and legal expert opinion in each autonomous republic, kray and oblast appears expedient.

Reconstitution of the All-Union Scientific Society of Forensic Physicians and Criminal Experts, which would ensure and strengthen the creative ties of experts, researchers and administrators of expert institutions in different branches, would contribute to increased cooperation of the legal expert opinion institutions.

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MARXIST-LENINIST WORLD VIEW AND IDEOLOGICAL STRUGGLE IN MEDICAL SCIENCE

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[Article by N. F. Loginov and V. P. Petlenko

[Text] The development of consciousness, primarily political consciousness and political culture, among the working masses in the process of socialist and communist construction is of unsurpassed and constantly growing importance. Pointing this out, the June (1983) Plenum of the CPSU Central Committee set appropriate goals for party organizations. In his speech at the Plenum, comrade Yu. V. Andropov, general secretary of the CPSU Central Committee, said: "We must also proceed from the standpoint that the formation of consciousness among communists and all citizens of our socialist society is the job not only of professional ideologists, propagandists, and people working in mass media. It is the job of the entire party."¹

The foundation and nucleus of communist consciousness is the scientific materialist world view. In this connection V. I. Lenin wrote: "We... set as our main goal the development of a solid revolutionary world view..."² It is well known that V. I. Lenin recognized Marxism as the only consistent and truly proletarian world view. In describing the "Communist Manifesto", he wrote: "This work describes the new world view with great clarity and brilliance..."³

Marxism-Leninism is the world view of all the Soviet people. The CPSU builds all of its revolutionary transformation activity and all of its communist education work on the firm foundation of Marxist-Leninist theory.

A world view is a system of generalized views of the objective world and man's place in the world, people's relationship to the activity surrounding them and to themselves, as well as their convictions, ideals, and principles of knowledge and activity that are determined by these views. A world view is not the sum of all of man's knowledge of the surrounding world, but a system of generalized views. It is essential for man to know the world, to find his place in it, to choose the corresponding lifetime goals, and outline the ways to achieve these goals and the consequences of his actions. All of this is focused in one's world view, which is also a way for the individual to come to understand himself.

A world view is a reflection of social life. In a class society, it has a class character. As a rule, the prevailing world view is that of the class that is in power.

Thus, the world view is the most general understanding of the world, man, and society, which determines man's social, political, philosophical, religious, moral, esthetic, scientific, and theoretical orientation.

The subjects of a world view are the individual, social group, class, and society. The world view is the nucleus both of the society's consciousness and the individual's consciousness.

In a class-antagonistic society there is no single world view and there cannot be, since each class has its own specific world view. There is an intense, irreconcilable struggle among the classes. The class with the most progressive method of production, the interests of which correspond to the objective trend in historical development and to data from science and social practice, is the class with the advanced world view. It is well known that in a bourgeois society this class is the working class; in the process of spreading the revolutionary movement, this class develops a communist world view.

The basic elements of a scientific world view are: a system of generalized views, ideas, and concepts of the world and man (knowledge), a set of principles and ideals, and a system of convictions and values.

We should stress that the Marxist-Leninist philosophy, political economics, and scientific communism offer generalized views and ideas of the world and man, that is, the knowledge found in a world view. Other social and natural sciences, including medical and biological sciences, also participate in the formation of these views.

A physician needs a world view not only for a proper understanding of medical problems, but also for a scientific orientation in contemporary problems of world politics. World politics are characterized by an unprecedented severity and tension in the ideological struggle. At the June Plenum of the CPSU Central Committee, Yu. V. Andropov, general secretary of the CPSU Central Committee said: "A battle is being waged for the minds and hearts of billions of people on the planet. Mankind's future depends to a great extent on the outcome of this ideological struggle."⁴

The battle of ideologies inevitably draws into its orbit the entire complex of contemporary scientific knowledge and its scientists and creators. Communist ideology is based on a scientific world view and is inconceivable without the assimilation of the fundamental achievements in all the sciences dealing with nature, society, and man. The experience in recent decades demonstrates convincingly that the logic of scientific progress makes the need to realize communist ideals even more obvious. Bourgeois ideology is anti-scientific in its very essence and in the foundation of its world view, but it still strives to find a basis in contemporary science and to utilize the high authority of science and scientists to strengthen its positions and to overthrow communism. This applies especially to the class of anthropological sciences, including

medicine and the associated fields of biology, sociology, pedagogy, and criminology.

These trends reflect one of the social consequences of the scientific and technical revolution--science turning toward man. All the aspects of anthropology have become an arena for active research using the most up-to-date methods. Major achievements have been made in anthro-genetics and medical genetics, in neurophysiology, psychopharmacology, zoopsychology, and human psychology. Ethology (the science of animal behavior) and other disciplines are tied to research on humans. The development of these sciences is primarily the consequence of the growing importance, in spite of the opinion of extreme technocrats, of the so-called "human factor" in all areas of social life (including military affairs).

The question of the relationship of medicine as a science to the ideological struggle today requires an examination of medicine's growing role in contemporary society, as well as its structure, which is an increasingly complex set of medical, biological, clinical, social, and hygienic disciplines, including scientific facts, methodologies, and specific theoretical constructs that by themselves are not involved in the ideological struggle; in addition to general methodological concepts and a world view which are formed under the strong influence of ideologies and themselves have a reciprocal influence on these views.

Materials on the June (1983) Plenum of the CPSU Central Committee indicate once again the importance of the human problem. In the speech given by K. U. Chernenko, secretary of the CPSU Central Committee, an important demand was made of scientists: "Clarity in one's world view, or if you like, methodological discipline of thought, is a necessary condition for the successful development of social sciences."⁵

Errors in the understanding of man's essence were cited as examples of violating methodological discipline: "One cannot recognize as scientific ideas which explain human qualities such as honesty, courage, and decency, as the result of 'positive' genes and deny that these qualities are formed by the social environment."⁶ This is not a new question, but it has taken on unprecedented urgency and importance today.

In contemporary Western sociology, psychology, pedagogy, criminology, and medicine we encounter concepts that "biologize" man and manifest a startling tenacity and adaptability to new scientific data. Some of the propositions in these teachings (such as Freudianism) still influence the views of scientists in some socialist countries. In our opinion, one of the reasons for this phenomenon can be found in the serious shortcomings in criticism found in our literature of the concepts that "biologize" man. We do not always apply Leninist principles of criticism to non-Marxist social doctrines, such as exposing their gnoseological and social roots, their objective role in the ideological life of contemporary society, combining criticism with positive resolution, from a Marxist standpoint, of the questions that have been posed, and striving to distinguish genuinely scientific achievements from their ideological interpretation. It is no coincidence that the June Plenum of the CPSU Central Committee stressed that proper scientific criticism plays an

important role in overcoming incorrect views in science: "It is unacceptable, of course, to apply ideological 'labels' in theoretical polemics, but this does not exclude the possibility of impartial evaluations of work which merits this."

To all teachings which would "biologize" man we can apply Lenin's description of idealism as a "barren flower" growing on the living tree of human knowledge, the gnoseological roots of which are "linearity and one-sidedness, a wooden and petrified quality, subjectivism and subjective blindness..."⁸

It seems to the authors that the general methodology of these teachings can be reduced to an effort to find in man some key anatomical and physiological properties or needs, and forms of behavior or psychological patterns inherited from man's ancestors. This is how a certain model of man in general is formulated, along with the idea of his "eternal nature," which are used as a basis for explaining social phenomena. Depending on what in man's "nature" is an author's focus, and what motives are driving him, man has been declared either "good" or "evil" by nature. In these doctrines both society and man are presented as absolute entities that are above historical influence. The most varied sociological teachings have been built and are still being built on this foundation. A certain principle has been observed: in the 18th and 19th centuries a number of optimistic doctrines on the transformation of society appeared that were based on the concept that man is "good by nature" (D. Diderot, L. Feuerbach, D. I. Pisarev, P. Kropotkin, etc.), but by the end of the 19th century the reactionary and pessimistic teachings of Nietzsche, Schopenhauer, and Nordau appeared, which were based on the idea of man's "failure and impotence." In the 20th century bourgeois philosophy and sociology are marked by the abasement of man, an effort to dethrone man, and gloomy prophecies of his degeneration and death.

All the contemporary teachings that "biologize" man are full of pessimism. They are a reflection of the complex processes of contemporary capitalist society and a response to the social demand of the contemporary bourgeoisie in its campaign against approaching socialism.

The gnoseological source of the theories that "biologize" man, including Freudianism, neo-Freudianism, social Darwinism, "social ethology," racism, and neo-eugenics, is a one-sided approach to man, an absolutist approach to his biological nature, a lack of understanding or a lack of desire to understand man's social nature, and a subjective approach to selecting and evaluating scientific data. The obvious and essentially banal fact that man belongs to the animal world often conceals the path toward a truly scientific understanding of man. The basic methodological error lies in reductionism and in efforts to reduce social phenomena, that are inherent in society as an extremely complex system, to characteristics of the "social atom"--the individual man--and then to reduce qualities of this abstract individual to biological characteristics.

Another error is the extensive and uncritical application of the "analogy" method and the "bold" transfer of concepts and ideas in the area of biology and medicine to society, as well as the utilization of sociological terminology to describe biological phenomena. For example, according to Lorentz, as a result of genetic selection we have inherited from the Stone Age "...an aggressive

instinct, fatal in its dimensions, which remains in our blood today as an evil legacy." N. Tinbergen (of England) believes that man "...has inherited the animal trait of group territoriality," which supposedly gives rise to war. How easily they "explain" the tragedies of world history!

At the June Plenum of the CPSU Central Committee the following was pointed out: "It has long been known how unproductive attempts have been to transfer concepts and methods of natural and technical sciences automatically to areas of social phenomena and to give simplified interpretations of the relationship between nature and society; this in essence interferes with strengthening creative cooperation between these sciences and social sciences." Here we can refer to V. I. Lenin, who wrote the following on the clumsy juggling of biological terminology: "These concepts cannot be used to study any social phenomenon and cannot clarify any method in social sciences. There is nothing easier than pinning a label from 'energetics' or 'biological sociology' on phenomena such as crises, revolutions, class struggles, and so forth, but there is also nothing more fruitless, more scholastic, and more lifeless than this concept."¹⁰ We still encounter biological sociology labels today. Contemporary social Darwinists, neo-eugenics, and "social ethologists" put these labels to use especially actively. A number of Western universities have introduced instruction in "social biology", the founders of which are seeking answers to social questions in human biology and the biology of man's animal ancestors.

It seems that there is a need for a more strict definition of the Marxist understanding of man in general and of the individual. K. Marx's thesis that "The essence of man is not an abstract quality, inherent in each individual. It is actually the sum of all social relations"¹¹ described a fundamentally new approach to the problem of man and was aimed directly against the ideas of Feuerbach, who was seeking man's essence in his anatomy and physiology.

Marx believed that the essence of man, that is, the quality that distinguishes him in a fundamental, qualitative way from an animal, should be sought not only and not so much in biology, but in his activities as a member of a qualitatively distinctive system--society. This also applies to the individual: "...The essence of an 'specific individual' is not his beard, blood, or abstract physical nature, but his 'social quality.'"¹²

We still encounter in our literature the concept of man's "bio-social" nature. In our opinion this is a confused formula. It confuses the question of man's structure as a unity of biological and social forms of physical movement with the question of man's essence, which is social and only social. Also false is the assertion that the body is biological and the personality social. The body of contemporary man is a product not only of biological evolution, but also of history. In turn the personality is formed not only under the influence of social conditions, but also under the influence of the individual's biological characteristics. The recognition of man's social essence should not lead to errors which would "sociologize" man, and it should not reject or trivialize man's biological elements.

Even at the level of the individual, the social elements cannot be reduced to biological elements. For example, the content of man's consciousness in principle cannot be reduced to the physiology or anatomy of the brain. Attempts to develop laws of general development on the basis of individual models are also wrong, since there is a qualitative boundary between the two different systems. Of course, reducing something complex to simple terms and some higher concept to lower principles is often justified as a device used in research, but reductionism as a principle of explanation leads to serious errors.

Critics of capitalism can also be found among the supporters of concepts that "biologize" man. For example, the leader of neo-Freudianism, E. Fromm, saw capitalism as a sick, neurotic society and socialism, in his opinion, was "the only constructive solution." But there are different kinds of criticism. In this case the criticism is coming from petit bourgeois and abstract romantic positions. V. I. Lenin drew a fundamental line between criticism of capitalism from petit bourgeois and proletarian positions. The petit bourgeois protests against the oppression of capital: "But how does it protest? It protests as a representative of a class that is perishing hopelessly, despairing of its future, cowed and cowardly..."¹³ Neo-freudian "socialism" has nothing in common with scientific socialism and is directed against true socialism. E. Fromm fabricated a petit bourgeois "socialist" utopia, placing hopes on psychoanalytic treatment of "individual pathology."

E. Fromm is not alone in his attempts to expand to the extreme the object of medicine and biology, along with their effectiveness in resolving social problems.

A number of natural scientists and physicians, entering the sphere of sociology, offer various prescriptions for "saving" mankind, including methods for man's biological and psychological adaptation using narcotics (I. Bodamer) or by having each individual develop his own "philosophy" of life (H. Selye). The supporters of neo-eugenics assert that all social problems are the result of man's biological imperfections and they see the solution in a "genetic revolution." We also see plans for using contemporary methods of technocratic manipulation and manipulation through scientism of the consciousness and behavior of the masses (C. Delgado). We encounter open racist and elitist propaganda less often in the scientific environment (K. Darlington, A. Jensen).

The ideas of those who "biologize" man are not as inoffensive as they may appear, since they are included in the ideology of all exploitative classes in every epoch. To justify their domination, exploiters have referred either to the will of god (heaven) or to nature, or to their so-called "blue blood." Any attempts to spread propaganda on the equality of people, even when references were also made to god and nature, were punished by fire and sword. Today using "need" and "natural law" as justification for the existence of the ruling imperialist elite has become an even more important task for them than in the past.

Here they turn to those scientists who either willingly or unwillingly offer "scientific" arguments for racism, chauvinism of all types, and for

discrimination against poor and colored people in educational systems and in other spheres of social life.

Bourgeois ideology takes advantage of the errors and political naivete of a number of important biologists, in whose subjective honesty of intentions we have no doubt. But, "...in politics it is not so important who defends directly known views. What is important is who benefits from these views, proposals, and measures."¹⁴ The objective role of all these perceptions of man, from the liberal views to the openly reactionary views that "biologize" man, is to work against the theory and practice of scientific socialism and to remove responsibility from capitalism for all the negative phenomena of war, racism, hunger, etc., and place it instead on man's "eternal" and supposedly defective "nature." Those who propagandize these teachings are on the same side of ideological barricades and in the same camp as those who defend capitalism.

The emergence of views that "biologize" man among individual Soviet scientists is a reaction to errors in evaluating the role of genetic factors in man's development and to the appearance of vulgar sociological notions among some representatives of anthropological disciplines. History has shown that when there is extensive interest in genetics and errors are corrected, errors have been made in the direction of underestimating the role of social conditions.

When criticizing theories that "biologize" man, it is important to understand and to rework the valuable scientific material that is used in these theories and to evaluate it from a Marxist standpoint. It is important to avoid the mistakes of the past. V. I. Lenin taught that it is the task of Marxists to be able to assimilate and rework the achievements of bourgeois scientists and at the same time "to know how to hold one's line and to combat all forces and classes that are hostile to us."¹⁵ Life presents a specific "ideological demand" on Marxist scientists to do further work on the urgent problems involving man.

FOOTNOTES

1. Yu. V. Andropov, "Izbrannyye Rechi i Stat'i" Selected Speeches and Articles, Moscow, Politizdat, 1983, p 284.
2. V. I. Lenin, "Polnoye Sobraniye Sochineniy" Complete Works, Vol 7, p 312.
3. Ibid., Vol 26, p 48.
4. Andropov, op. cit., p 285.
5. "Materialy Plenuma TsK KPSS. 14-15 Iunya 1983" Materials on the Plenum of the CPSU Central Committee. 14-15 June 1983, Moscow, Politizdat, 1983, p 35.
6. Ibid., p 34.
7. Ibid., p 35.

8. Lenin, op. cit., Vol 29, p 322.
9. KOMMUNIST, No 9, 1983, p 21.
10. Lenin, op. cit., Vol 18, p 348.
11. K. Marx and F. Engels, "Sochineniya" Works, Vol 42, p 262.
12. Ibid., Vol 1, p 242.
13. Lenin, op. cit., Vol 23, p 256.
14. Ibid., Vol 23, p 61.
15. Ibid., Vol 18, p 354.

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