

**RUSSIAN ACADEMY OF SCIENCES**

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**RUSSIAN FEDERATION STATE RESEARCH CENTER –  
INSTITUTE OF BIOMEDICAL PROBLEMS OF THE  
RUSSIAN ACADEMY OF SCIENCES**



**XV CONFERENCE ON SPACE BIOLOGY AND AEROSPACE MEDICINE  
WITH INTERNATIONAL PARTICIPATION**

**BION-M1 PROJECT: SCIENCE RESULTS AND FUTURE PLANS**

**NOVEMBER 18 – 20, 2014, MOSCOW**

## **DEAR COLLEAGUES,**

I would like to extend my sincere greetings to each and every one of conference attendees, to those who took part in the Bion-M1 project as well as to those who are involved in other aspects of space biology and physiology research.

It is everybody's knowledge that many experiments and investigations, which made significant contributions to life sciences advancement, were successfully performed during 11 Bion missions flown by our country in 1973-1997. Sixteen years after completion of the Bion-11 mission, the first biosatellite of the Bion-M series was launched on April 19, 2013. The Bion-M1 flight proved an important event in Russian and world cosmonautics that demonstrated the important role experimental investigations play in fundamental and applied research.

Bion-M1 was designed and developed within the framework of the Federal Space Program of Russia for the period of 2005 – 2015. The spacecraft, as other biosatellites flown earlier, was manufactured by the State Science-Production Space-Rocketry Center CSDB-Progress (TsSKB-Progress, Samara). The agency responsible for the development and implementation of a comprehensive program of scientific experiments, for the development of research hardware, as well as for the selection and preparation of biological specimens was the RF State Research Center – Institute of Biomedical Problems of the Russian Academy of Sciences.

The Bion-M1 experimental investigations were carried out with the participation of 70 Russian research and education centers as well as foreign scientists.

I believe that during the upcoming meetings it will be very important to discuss not only Bion-M1 science results but also investigations that need to be performed in future space flights and ground simulation studies.

I would like to wish the Conference participants stimulating discussions and enjoyable meetings with your colleagues.

**I.B. Ushakov, Academician  
IMBP RAS Director  
Program Committee Chair**

## **General Information**

The Conference meetings will take place in the Presidium of the Russian Academy of Sciences located at 32A Leninsky Prospect, Moscow. The closest Metro station is Leninsky Prospect. The closest trolley-bus stop (## 4, 7, 33, 62 from the Metro station Oktyabrskaya) is Gagarin Plaza.

To enter the building, you'll be required to show a passport or another Photo ID document.

The working languages will be Russian and English. Simultaneous translation will be provided.

The financial support to the Conference is given by the Presidium of the Russian Academy of Sciences, the Russian Foundation of Fundamental Investigations, and OAO "Fund Service Bank".

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## CONFERENCE PROGRAM

*Tuesday, November 18*     *09:30 – 11:00*     *Presidential Hall*  
**Opening Ceremony and Plenary Session**

*Tuesday, November 18*     *11:30 – 13:00*     *Presidential Hall*  
**Cardiovascular and Respiratory Systems**

*Tuesday, November 18*     *14:00 – 15:30*     *Presidential Hall*  
**Biochemistry and Morphology of Internal Organs**

*Tuesday, November 18*     *15:30 – 17:00*     *Presidential Hall*  
**Genomics and Proteomics**

*Tuesday, November 18*     *11:30 – 13:00*     *Conference Hall*  
**Biotechnology**

*Tuesday, November 18*     *14:00 – 15:30*     *Conference Hall*  
**Microbiological Investigations**

*Tuesday, November 18*     *15:30 – 17:00*     *Conference Hall*  
**Radiation Studies**

*Wednesday, November 19*     *09:30 – 11:00*     *Presidential Hall*  
**Central Nervous and Sensory Systems (Session 1)**

*Wednesday, November 19*     *11:30 – 13:00*     *Presidential Hall*  
**Central Nervous and Sensory Systems (Session 2)**

*Wednesday, November 19*     *14:00 – 16:00*     *Presidential Hall*  
**Motor System (Session 1)**

<b>Wednesday, November 19</b>	<b>16:00 – 17:00</b>	<b>Presidential Hall</b>
<b>Motor System (Session 2)</b>		
<b>Wednesday, November 19</b>	<b>17:00 – 18:30</b>	<b>Presidential Hall</b>
<b>Skeletal Tissues</b>		
<b>Wednesday, November 19</b>	<b>09:30 – 11:00</b>	<b>Conference Hall</b>
<b>Exobiology</b>		
<b>Wednesday, November 19</b>	<b>11:30 – 13:00</b>	<b>Conference Hall</b>
<b>Plants in Space</b>		
<b>Thursday, November 20</b>	<b>09:30 – 11:00</b>	<b>Presidential Hall</b>
<b>Immunology</b>		
<b>Thursday, November 20</b>	<b>11:30 – 13:30</b>	<b>Presidential Hall</b>
<b>Cell Biology</b>		
<b>Thursday, November 20</b>	<b>14:30 – 15:00</b>	<b>Presidential Hall</b>
<b>Hardware for Behavioral Studies of Rodents</b>		
<b>Thursday, November 20</b>	<b>15:00 – 17:30</b>	<b>Presidential Hall</b>
<b>Round Table Discussion: Major Bion-M1 Science Results and Research Plans for Bion-M2 Mission</b>		

**Tuesday, November 18**

**09:30 – 11:00**

**Presidential Hall**

**Opening Ceremony**

**Chaired by I. B. Ushakov**

**Welcome Addresses – A. I. Grigoriev, RAS Vice-President  
L. M. Zelenyi, RAS Vice-President, Chair of the  
RAS Cosmos Council  
Roscosmos**

**Plenary Session: Bion-M1 Mission**

**Chaired by E. A. Ilyin**

- **Bion-M1 Mission: Overview and Overall Schedule.** *V.N. Sychev, E.A. Ilyin, E.N. Yarmanova, D.V. Rakov, B.S. Shenkman, I.B. Ushakov, A.N. Kirilin, O.I. Orlov, A.I. Grigoriev (IMBP RAS, SRC Progress)*
- **Bion Spacecraft – Yesterday, Today, Tomorrow.** *V.I. Abrashkin (SRC Progress)*
- **Pre-flight Preparations and Post-flight *in vivo* Investigations of Experimental Mice.** *A.A. Andreev-Andrievsky, A.S. Popova, O.L. Vinogradova, O.N. Dolgov, K.V. Anokhin, D.V. Tsvirkun, B.S. Shenkman, V.N. Sychev (IMBP RAS, Kurchatov Institute).*

**11:00 – 11:30**

**Coffee Break**

**Tuesday, November 18**

**11:30 – 13:00**

**Presidential Hall**

### **Cardiovascular and Respiratory Systems**

**Chaired by O.L. Vinogradova**

- Telemetry Recording of Blood Pressure and Heart Rate of Mice During and After Spaceflight. *A.A. Andreev-Andrievsky, J. Lloret, A.S. Popova, P. Aubrey, D.V. Tsvirkun, H. Gauquelin-Koch, E.A. Ilyin, C. Gharib, M.A. Custaud, O.L. Vinogradova (IMBP RAS, Moscow State University, University of Angers)*
- Spaceflight Effects on Vasomotor Responses of Small Arteries in Various Organs. *O.S. Tarasova, S.S. Sofronova, A.A. Borzykh, D.K. Gainullina, O.L. Vinogradova, M.D. Delp (IMBP RAS, Moscow State University, Florida State University)*
- Spaceflight Effects on Physiological Activity of Resident Cardiac Stem Cells of Mammals. *G.B. Belostotskaya, E.A. Zakharov (Sechenov Institute of Evolutionary Physiology and Biochemistry, Federal Medicine Research Center)*
- Spaceflight Effects on Pulmonary Surfactants. *I.G. Bryndina (Izhevsk Medicine Academy)*
- Spaceflight Effects on the Amount of Endogenous CO Exhaled by C57Bl/6 Mice During Their 30-Minute Exposure to a CO-Free Environment. *Yu.A. Shulagin, A.I. Dyachenko, S. Tatarkin (IMBP RAS)*

**13:00 – 14:00**

**Lunch**

**Tuesday, November 18**

**14:00 – 15:30**

**Presidential Hall**

### **Biochemistry and Morphology of Internal Organs**

**Co-Chaired by B.V. Morukov and V.I. Gulimova**

- Investigations of Thick-Pawed Geckos in a 30-Day Spaceflight. *V. I. Gulimova (Institute of Human Morphology, Russian Academy of Medical Sciences)*
- Spaceflight Effects on the Pancreas of C57Bl/6 Mice. *A.E. Proshchina, Yu.S. Krivova, S.V. Savelyev (Institute of Human Morphology, Russian Academy of Medical Sciences)*
- Spaceflight Effects on the Fibrous Components of the Extracellular Matrix of Connective Tissue of the Gastrointestinal Organs of C57Bl/6 Mice. *D.A. Atyakshin (Burdenko Medicine Academy, Voronezh)*
- Spaceflight Effects on the Structure and Biochemistry of the Parotid Gland of Mice. *L.M. Erofeeva, S.V. Belozarov, T.G. Ostrovskaya, T.P. Vavilova (Moscow Medical-Stomatological University)*
- Localization of Regulatory Peptides in the Kidneys of Experimental Animals Exposed to Real and Simulated Microgravity. *I.A. Nichiporuk, G.Yu. Vasilyeva, Yu.I. Vasilegina (IMBP RAS)*
- Spaceflight Effects on Collagen Metabolism in the Skin of C57Bl/6 Mice. *E.G. Butolin, O.V. Danilova (Izhevsk Medicine Academy)*

**Tuesday, November 18**

**15:30 – 17:00**

**Presidential Hall**

### **Genomics and Proteomics**

**Co-Chaired by O.A. Gusev and A.S. Ivanov**

- Genomic Analysis of the Transcription Response in Various Organs of Mice Flown on Bion-M1. *O.A. Gusev (Kazan Federal University)*
- Effect of Gravitational Unloading on Isatin-Binding Proteins in Mice Exposed to Real and Simulated Microgravity. *A.S. Ivanov (Orekhovich Institute of Biomedical Chemistry, Russian Academy of Medical Sciences)*
- Spaceflight Effects on Cytochromes P450 in the Liver of Mice. *N.E. Moskaleva (Orekhovich Institute of Biomedical Chemistry, Russian Academy of Medical Sciences)*
- Mapping of Ubiquitinated Subproteome of Mice Flown on Bion-M1. *A.S. Zhabereva (State Medical Academy, Nizhnyi Novgorod)*

**Tuesday, November 18**

**11:30 – 13:00**

**Conference Hall**

**Biotechnology**

**Co-Chaired by I.A. Smirnov and V.K. Ilyin**

- Results of BioUtilization Experiments on Foton and Bion Spacecraft.  
*V.K. Ilyin, D.V. Korshunov (IMBP RAS)*
- Power Characteristics of Microbial Fuel Cells Used on Foton-M4 and on the Ground. *I.A. Smirnov, V.K. Ilyin, A.Yu. Tyurin-Kuzmin, P.E. Soldatov, T.S. Smolenskaya, D.V. Korshunov (IMBP RAS)*
- Biodegradation of Cellulose-Containing Organic Wastes by Thermophilic Anaerobic Microbes in Spaceflight. *E.R. Sadraddinova (Moscow State University)*
- Absorbed Probiotics: New Applications in Extreme Environments.  
*E.A. Tereshkova, I.B. Brodsky (ZAO Partner)*

**Tuesday, November 18**

**14:00 – 15:30**

**Conference Hall**

### **Microbiological Investigations**

**Co-Chaired by V.K. Ilyin and E.A. Tereshkova**

- CARBON, MRT and SIGMA Payloads for Bion-M1 and Foton-M4 Spaceflight Experiments. *V.I. Abrashkin, Yu.N. Gorelov, L.V. Kurganskaya, A.V. Shcherbak (SRC Progress, Samara Medical University)*
- Effects of Space Microgravity and Hypomagnetic Fields on Soil Biochemistry and Microbiology. *O.Yu. Sarokvasha, E.A. Galanskaya, O.A. Pavlova (Samara State University, Samara Medical University)*
- Spaceflight Effects on Microorganisms. *V.A. Gritsenko, N.I. Tanaeva, A.V. Zhestkov (Samara Medical University)*
- Spaceflight Effects on Probiotic Microorganisms *Enterococcus durans* (Strain RSH), *Leuconostoc mesenteroides* (Strains 3M and 3B), and *Streptococcus thermophiles* (Strain RAV) Exposed as Monocultures or Symbiotic Consortium. *A.I. Shestakov (Moscow State University)*

**Tuesday, November 18**

**15:30 - 17:00**

**Conference Hall**

### **Radiation Studies**

**Chaired by V.A. Shurshakov**

- Ionizing Radiation Doses Measured by Thermoluminescent Detectors on the Bion-M1 Exterior Walls. *E.A. Dvlgopolaya, I.S. Kartsev, R.V. Tolocek, V.A. Shurshakov (IMBP RAS)*
- Application of a Combined Method Using Passive Detectors for Measuring Cosmic Radiation on Bion-M1. *K.O. Inozemtsev, V.V. Kushin, R.V. Tolocek, V.A. Shurshakov (IMBP RAS)*
- Radiation Dose Power Variations Inside Bion-M1 as Measured by RD3-B3 Dosimeters. *O.A. Ivanova, T. Dachev, B. Tomov, Y. Matvijchuk, P. Dimitrov, V.A. Shurshakov (IMBP RAS)*
- Specific Requirements for Dosimetry of Biological Experiments onboard Unmanned Spacecraft. *V.A. Shurshakov, O.A. Ivanova (IMBP RAS)*
- Dose Measurements on Bion-M1 by Passive Detectors. *A. Stradi, J.K. Palfalvi, J. Szabo, V.A. Shurshakov, R.V. Tolocek, T. Berger, I. Ambrozova, S. Kodaira, J. Kubancak (IMBP RAS, Hungary)*

**Wednesday, November 19      09:30 – 11:00      Presidential Hall**

**Central Nervous and Sensory Systems (Session 1)**

**Co-Chaired by I.B. Kozlovskaya and A.S. Shtemberg**

- Scientific findings of the US investigators from the Bion-M1 mission.  
*R. Boyle (NASA Ames Research Center)*
- Status of Mice On Day 1 After Their Return From the Bion-M1 30-Day Spaceflight. *A.S. Popova, A.A. Andreev-Andrievsky, O.N. Dolgov, J. Alberts, O.L. Vinogradova (IMBP RAS, Moscow State University, Indiana State University)*
- Catecholamines and Their Metabolites in Blood and Brain Structures of Mice Flown on Bion-M1. *A.S. Bazyan, A.S. Shtemberg, V.S. Kudrin (Institute of Higher Nervous Activity and Physiology RAS, IMBP RAS, Institute of Pharmacology, Russian Academy of Medical Sciences)*
- Long-Duration Spaceflight Effects on 5-HT Gene Expression in Mice. *A.S. Tsybko, A.V. Kulikov, E.M. Kondaurova, E.A. Kulikova, I.B. Krasnov, B.S. Shenkman, E.Yu. Bazhenova, N.A. Sinyakova, V.S. Naumenko, N.K. Popova (Institute of Cytology and Genetics, RAS Siberian Branch, IMBP RAS)*

**11:00 – 11:30      Coffee Break**

**Wednesday, November 19    11:30 – 13:00    Presidential Hall**

**Central Nervous and Sensory Systems (Session 2)**

**Co-Chaired by I.B. Kozlovskaya and A.S. Shtemberg**

- Behavioral and Physiological Changes in Snails Flown on Foton and Bion-M1. *N.A. Aseev, A.Yu. Malyshev, T.A. Korshunova, M.S. Lemak, M.V. Roshchin, A.B. Zyuzina, K.S. Zakharov, P.M. Balaban (Institute of Higher Nervous Activity and Neurophysiology RAS)*
- Study of the Vestibular Cerebellum of Geckos and C57Bl Mice Flown on Bion-M1. *A.E. Proshchina, A.S. Kharlamova, V.M. Barabanova, V.I. Gulimova, S.V. Savelyev (Institute of Human Morphology, Russian Academy of Medical Sciences)*
- Otolith Organs of the Vestibular Apparatus of Mice Flown on Bion-M1. *D.V. Lychakov, L.V. Zueva, B.S. Shenkman, T.A. Kharkevich (Sechenov Institute of Evolutionary Physiology and Biochemistry, IMBP RAS)*
- Morphological Changes in Motor Neuron Nuclei of the Optic Nerve of Mice Flown on Bion-M1. *R.S. Shtanchaev, I.B. Mikheeva, N.A. Penkova, L.L. Pavlik (Institute of Theoretical and Experimental Biophysics RAS)*
- Degenerative Changes in the Retina of Mice Flown on Bion-M1. *A.E. Bugrova, T.F. Shevchenko, T.S. Konstantinova, G.R. Kalamkarov (Institute of Biochemical Physics RAS)*

**13:00 – 14:00    Lunch**

**Wednesday, November 19 14:00 – 16:00 Presidential Hall**

**Motor System (Session 1)**

**Co-Chaired by B.S. Shenkman and R.R. Islamov**

- Isoforms and Gene Expression of Giant Proteins in Thin and Thick Fibers of Cross-Striated Muscles of Mice Flown on Bion-M1. *A.D. Ulanova, Yu.V. Gritsyna, I.M. Vikhlyantsev, N.N. Salmov, A.G. Bobylev, Z.R. Abdusalamova, V.V. Rogachevsky, B.S. Shenkman, Z.A. Poddubnaya (Institute of Theoretical and Experimental Biophysics RAS, IMBP RAS)*
- Spaceflight Effects (Bion-M1) on the Structure and Proteins of Cardiac and Skeletal Muscle Fibers of Mice. *I.V. Ogneva, M.V. Maksimova, I.M. Larina (IMBP RAS, First Moscow State Medical University)*
- Effects of a 30-Day Spaceflight and Recovery on Signal Pathways Regulating Protein Synthesis and Degradation in Skeletal Muscles of Mice. *T.M. Mirzoev, N.A. Vilchinskaya, S.A. Tyganov, Yu.N. Lomonosova (IMBP RAS)*
- Expression of Myogenic Regulatory Factors and Progenitor Cell Proliferation in *m. longissimus dorsi* of Mice Flown on Bion-M1. *E.G. Altaeva, O.V. Turtikova, B.S. Shenkman (IMBP RAS)*
- Changes in the Myosin Phenotype of Skeletal Muscles of Mice Flown on Bion-M1. *S.P. Belova, Yu.N. Lomonosova, T.L. Nemirovskaya, B.S. Shenkman (IMBP RAS)*

**Wednesday, November 19    14:00 – 16:00    Presidential Hall**

**Motor System (Session 2)**

**Co-Chaired by B.S. Shenkman and R.R. Islamov**

- Gravitational Effects on Calbindin Containing Spinal Cord Neurons. *V.V. Porseva, V.V. Shilkin, A.A. Strelkov, I.B. Krasnov, P.M. Maslyukov (Yaroslavl Medical Academy, IMBP RAS)*
  
- Study of Motor Neurons of the Lumbar Compartment of the Spinal Cord of Mice After a 30-Day Spaceflight on Bion-M1 and 7-Day Readaptation. *O. Tyapkina (Kazan Medical University, Kazan Institute of Biochemistry and Biophysics RAS)*
  
- Immunohistochemistry of the Glia of the Lumbar Compartment of the Spinal Cord of Mice and the Hypogravity Motor Syndrome. *T. Povysheva (Kazan Medical University)*

**Wednesday, November 19    17:00 – 18:30    Presidential Hall**

**Skeletal Tissues**

**Co-Chaired by V.E. Novikov and N.V. Rodionova**

- Musculoskeletal findings of the US investigators from the Bion-M1 flight. *D. Fitzgerald (Oregon Health and Science University)*
  
- Chemical Elements in the Bone Mineral Component of Mice Flown on Bion-M1. *O.E. Kabitskaya, A.M. Skripkin, V.E. Novikov, V.S. Oganov, M.A. Barkov, V.V. Grigoriev, P.A. Khatyushin (IMBP RAS, NPO Typhoon)*
  
- Study of Geckos and Tail Vertebrae of Mice Flown on Bion-M1. *S.V. Savelyev, V.I. Gulimova, V.M. Barabanov, A.E. Proshchina, A.I. Kurtova, Yu.S. Krivova, A.S. Kharlamova, A.V. Buzmakov, D.A. Zolotov, R.A. Senin, A.S. Khlebnikov, I.L. Okshtein, V.E. Asadchikov (Institute of Human Morphology, Russian Academy of Medical Sciences, Institute of Crystallography RAS, Kurchatov Institute, Institute of Theoretical and Experimental Physics)*
  
- Morphological and Functional Changes of Osteogenic Cells in Bone Remodeling Zones During Exposure to Microgravity (Bion-M1). *N.V. Rodionova, V.S. Oganov, O.E. Kabitskaya, E.V. Katkova, O.N. Nesterenko (Institute of Zoology, Ukrainian Academy of Sciences, IMBP RAS)*

**Wednesday, November 19      09:30 – 11:00      Conference Hall**

**Exobiology**

**Co-Chaired by V.K. Ilyin and E.M. Rivkina**

- Survival of Thermophilic Microorganisms Embedded in Artificial Meteorite After Reentry Through the Dense Layers of Earth's Atmosphere. (Meteorite Experiments). *A.I. Slobodkin, S.N. Gavrilov (Institute of Microbiology RAS)*
- Survival of Fungi and Spore Forming Microorganisms Embedded in Artificial Meteorite After Reentry Through the Dense Layers of Earth's Atmosphere. (Meteorite Experiments). *N.A. Polikarpov, E.A. Deshevaya (IMBP RAS)*
- Spaceflight Effects on Permafrost Soil Microorganisms. *E.M. Rivkina, E.V. Spirina, L.A. Shmakova, A.V. Shatilovich, A.A. Abramov (Institute of Soil Studies RAS)*
- Biological Activity of Microorganisms Flown on Bion-M1 and Foton-M4. *T.A. Voeikova (Genetics Research Center)*
- Radiochemical Reactions Involving Primary BioOrganic Compounds in Outer Space. *N. Gontareva (Institute of Cytology RAS)*

**11:00 – 11:30**

**Coffee Break**

**Wednesday, November 19    11:30 – 13:00    Conference Hall**

### **Plants in Space**

**Co-Chaired by Yu.A. Berkovich and A.Yu. Skripnikov**

- Potential Use of the Spaceflight Environment for Developing High Yield Cereals and Legumes. *A.V. Milekhin, V.V. Syukov, P.N. Malchikov, A.I. Katyuk, S.L. Rubtsov (Agriculture Research Center)*
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- Plant Growth from Seeds Flown on Bion-M1. *Yu.N. Gorelov, L.M. Kavelenova, L.V. Kurganskaya, S.A. Rozno, I.V. Ruzaeva (Samara Medical University)*
- Major Goals of Technologies for Plant Cultivation in Advanced Long- and Superlong Space Missions. *V.G. Vasin, V.V. Rakitina (Samara Agricultural Academy)*
- Preliminary Results of Phototrophic Studies of Moss *Physcomitrella patens* Flown on Bion-M1 and Foton-M4. *V.B. Nikitin, Yu.A. Berkovich, A.Yu. Skripnikov, M.Z. Mukhoyan, G.A. Emelyanov (Moscow State University, IMBP RAS, TsNIIMash)*
- Cytogenetic Characteristics of the Root Meristem of Lettuce Seedlings from Seeds Flown on Bion-M1. *N.G. Platova, V.M. Petrov (IMBP RAS)*
- Physiology and Ultrastructure of *Peltigera aphthosa* Lichen After Exposure to an Extreme Environment. Biological Investigations Onboard Unmanned Space Vehicles. *M.Yu. Dyakov (Moscow State University)*

**Thursday, November 20**

**09:30 – 11:00**

**Presidential Hall**

**Immunology**

**Co-Chaired by M.P. Rykova and E.G. Novoselova**

- Immune Responses of C57Bl/6 Mice to Altered Gravity. *I.B. Morukov, M.P. Rykova, E.N. Antropova, T.A. Berendeeva, S.A. Ponomarev, B.V. Morukov (IMBP RAS)*
- Study of the Activity of Leucocyte Elastase, Alpha-1 Proteinase Inhibitor, and Concentration of Idiotypic and Anti-Idiotypic Antibodies to Nervous Tissue Proteins in Space. *S.G. Morozov (Institute of General Pathology and Pathophysiology, Russian Academy of Medical Sciences)*
- Stress Response, Signaling and Apoptosis of Immune Cells of Bion-M1 Mice. *E.G. Novoselova, S.M. Lunin, M.O. Khrenov, S.B. Parfenyuk, T.V. Novoselova, O.V. Glushkova, B.S. Shenkman, E.E. Fesenko (Institute of Cell Biophysics RAS, IMBP RAS)*
- Lymphoid (Immune) Structures in the Spleen and Jejunum Walls of Mice After Exposure to Real and Simulated Microgravity. *D.E. Grigorenko, G.G. Aminova, L.M. Erofeeva (Institute of Human Morphology, Russian Academy of Medical Sciences)*
- Structure and Function of the Lymphoid Tissue of Lymph Nodes of Bion-M1 Mice. *L.E. Bulekbaeva, G.A. Demchenko, L.M. Erofeeva, E.A. Ilyin (Institute of Human and Animal Physiology, Kazakhstan, IMBP RAS, Moscow Medical-Stomatological University)*

**11:00 – 11:30**

**Coffee Break**

**Thursday, November 20      11:30 – 13:30      Presidential Hall**

### **Cell Biology**

**Co-Chaired by L.B. Buravkova and A.A. Ivanov**

- Primary Culture of Femoral Bone Marrow of C57Bl/6 Mice Flown on Bion-M1. *E.R. Andreeva, A.N. Gornostaeva, E.V. Maslova, I.V. Andrianova, E.A. Goncharova, L.B. Buravkova (IMBP RAS)*
- Proliferative and Differential Potentials of Stromal Cell Differon of C57Bl/6 Mice Flown on Bion-M1. *E.A. Goncharova, P.I. Bobyleva, I.V. Andrianova, M.P. Poe, E.R. Andreeva, L.B. Buravkova (IMBP RAS)*
- Morphofunctional Parameters of Cultured Fibroblastoid Cells from the Rib Hyaline Cartilage Flown on Foton-M4. *L.T. Volova, V.V. Rossinskaya, V.V. Boltovskaya, M.N. Milyakova (Samara Medical University)*
- Use of 3D-Biocarriers for Studying Mesenchymal Cell Cultures on Bion-M1. *L.T. Volova, V.V. Rossinskaya, V.V. Boltovskaya, M.N. Milyakova (Samara Medical University)*
- Cytogenetic Characteristics of Bone Marrow Cells from Bion-M1 Mice. *A.A. Ivanov, O.V. Dorozhkina (IMBP RAS, Federal Medical Biophysics Center, Joint Institute of Nuclear Research)*
- Differentiation of Cellular –Metabolic Effects in Laboratory Animals Exposed to Microgravity at Submagnetospheric Orbits. *I.B. Alchinova, E.N. Arkhipova, Yu.S. Medvedeva, Yu.Yu. Ivin, M.Yu. Karganov (Institute of General Pathology and Pathophysiology, Russian Academy of Medical Sciences, Institute of Poliomyelitis and Viral Encephalitis, Russian Academy of Medical Sciences)*

**13:30 – 14:30**

**Lunch**

**Thursday, November 20      14:30 – 15:00      Presidential Hall**

- A review of equipment existing today to monitor behavioral changes in rodents. *Dr. Harm Johan Knot (TSE Systems Germany)*

**Thursday, November 20      15:00 – 17:30      Presidential Hall**

**Round Table Discussion: Major Bion-M1 Science Results and Research  
Plans for Bion-M2 Mission**

**Chairman: V.N. Sychev**

**Moderators: B.S. Shenkman, V.K. Ilyin, and V.A. Shurshakov**

**All Conference attendees are kindly invited to take part in the  
round table discussion**