


THE MEETING IS DEDICATED TO 75TH ANNIVERSARY OF FAZLY ATAULLAKHANOV



SYSTEMS BIOLOGY AND SYSTEMS PHYSIOLOGY: REGULATION OF BIOLOGICAL NETWORKS

HYBRID CONFERENCE
AUG 25-27, 2021
SCIENTIFIC PROGRAM

SCIENTIFIC PROGRAM

AUGUST 25th, 2021

GMT+3

9:00-10:00

MAIN REGISTRATION

10:00-11:30

GRAND OPENING

11:30-12:30

L U N C H B R E A K

SECTIONS

12:30-16:30

BIOLOGICAL SYSTEMS OF THE
SUPRACELLULAR LEVEL:
HEMOSTASIS, IMMUNITY,
NEUROBIOLOGY (PART 1)

Chairs: Vitaly Volpert, France
Vladimir Kolyadko, USA

12:30-13:05

Simulation of the coagulation system,
Tool or Toy?

Coenraad Hemker

Maastricht University
the Netherlands

- 13:05-13:35 Construction of self-adaptive biomaterials surface with high blood compatibility
Qiang Shi
Changchun Institute of Applied Chemistry, Chinese Academy of Sciences
China
- 13:35-14:05 Synergism between anticoagulation and phototherapy to prevent the thrombotic complications
Zhifang Ma
Changchun Institute of Applied Chemistry, Chinese Academy of Sciences
China
- 14:05-14:35 Modelling of blood clotting in aneurysm
Vitaly Volpert
Institut Camille Jordan, University Lyon 1
France
- 14:35-14:50 C O F F E E B R E A K
- 14:50-15:20 Numerical and qualitative investigation of the mathematical model of blood coagulation with membrane reactions
Alexey Lobanov
Moscow Institute of Physics and Technology
Russia

15:20-15:40

Inhibition of blood coagulation:
biochemistry, structural biology, and
translational applications

Vladimir Kolyadko

The Children's Hospital of Philadelphia
Philadelphia, USA

15:40-16:00

A mechanistic model for
thromboelastography

Anand Mohan

IIT Hyderabad
Sangareddy, India

16:00-16:30

In silico modelling of hemostatic
response: challenges and perspectives

Dmitry Nechipurenko

Center for Theoretical Problems of
Physico-Chemical Pharmacology,
Russian Academy of Sciences
Russia

16:30-17:50

**FUNDAMENTALS OF LIFE:
PRINCIPLES OF FUNCTIONING OF
BIOLOGICAL SYSTEMS
(ANNIVERSARY SECTION)**

Chair: Mikhail Panteleev, Russia

16:30-16:50

The end of hemostasis

Mikhail Panteleev

Center for Theoretical Problems of
Physico-Chemical Pharmacology,
Russian Academy of Sciences
Russia

16:50-17:10

Fazli - scientist, friend, Boss

Victor Vitvitsky

University of Michigan
Michigan, USA

17:10-17:30

Fazly's scientific life in the Wild West

Richard McIntosh

University of Colorado Boulder
Colorado, USA

17:30-17:50

50 years in science: The Outcome

Fazly Ataulakhanov

Center for Theoretical Problems of
Physico-Chemical Pharmacology,
Russian Academy of Sciences
Russia

17:50-18:05

C O F F E E B R E A K

18:05-21:40

CELL DIVISION AND MOLECULAR MOTORS

Chairs: Nikita Gudimchuk, Russia
Vladimir Volkov, the Netherlands

18:05-18:40

The tip of a growing microtubule and its implications for polymer dynamics

Richard McIntosh

University of Colorado Boulder
Colorado, USA

18:40-19:10

Electron cryo-tomography provides insight into the regulation of microtubule dynamics by end-binding protein assemblies

Vladimir Volkov

Delft University of Technology
the Netherlands

19:10-19:40

Mechanisms of microtubule dynamic instability examined with Monte-Carlo simulations and in vitro reconstitution experiments

Nikita Gudimchuk

Center for Theoretical Problems of
Physico-Chemical Pharmacology,
Russian Academy of Sciences
Russia

19:40-20:10

Harnessing Dynamic Microtubule Ends:
lessons from reconstruction studies in
vitro

Ekaterina Grischuk

University of Pennsylvania,
Philadelphia, USA

20:10-20:20

C O F F E E B R E A K

20:20-20:50

Role of tropomyosin dynamics in
regulation of cardiac muscle in health
and disease

Andrey Tsaturyan

Lomonosov Moscow State University
Russia

20:50-21:20

Structure of super-relaxed myosin heads
in relaxed muscle

Natalia Kubasova

Lomonosov Moscow State University
Russia

21:20-21:40

The ratio of Tpm α - and β -chains in the
thin filament affects the actin-myosin
interaction

Salavat Nabiev

Institute of Immunology and Physiology,
Ural Branch of the Russian Academy of
Sciences
Russia

AUGUST 26th, 2021

GMT+3

9:30-13:00

METHODOLOGICAL ISSUES OF BIOPHYSICS

Chairs: Vladik Avetisov, Russia
Anatoly Vanin, Russia

9:30-10:00

Oxidative modification of fibrinogen molecules: structural and functional aspects

Lyubov Yurina

N.M. Emanuel Institute of Biochemical Physics Russian Academy of Sciences
Russia

10:00-10:30

Physical chemistry of dinitrosyl iron complexes as a determinant of their biological activity

Anatoly Vanin

Semenov Federal Research Center for Chemical Physics, Russian Academy of Sciences
Russia

10:30-11:00

Reversible aggregation and deformation of RBC as determining factors of blood fluidity control

Alexander Priezhev

Lomonosov Moscow State University
Russia

11:00-11:30

Biophysics in tissue engineering

Yury Rochev

Centre for Research in Medical Devices
(CURAM), National University of
Ireland
Ireland

11:30-12:00

Euler arches and Duffing oscillators a
few nanometers in size

Vladik Avetisov

Semenov Institute of Chemical Physics
of the Russian Academy of Sciences
Russia

12:00-12:30

How does viscosity help (!) the dynamics
of spatial self-organization of molecular
and supramolecular structures?

Konstantin Shaitan

Lomonosov Moscow State University
Russia

12:30-13:00

Computer Simulation of the Heart and
Machine Learning for Basic Research in
Physiology and Clinical Applications

Olga Solovieva

Institute of Immunology and Physiology,
Ural Branch of the Russian Academy of
Sciences
Russia

13:00-13:15

C O F F E E B R E A K

13:15-18:20

**METHODOLOGICAL ISSUES OF
SYSTEMS BIOLOGY AND SYSTEMS
PHYSIOLOGY**

**Chairs: Svetlana Komarova, Canada
Vladimir Sulimov, Russia**

13:15-13:45

Biophysical and biochemical properties
of biocrystal hemozoin produced by
malaria parasite

Oleksii Skorohod

University of Torino
Italy

13:45-14:15

Reimagining the interaction between
stress-induced glucocorticoids and
gastric ulceration: the importance of a
methodological approach

Lyudmila Filaretova

Pavlov Institute of Physiology, Russian
Academy of Sciences
Russia

14:15-14:45

Quantum docking

Vladimir Sulimov

Research Computing Center
Russia

14:45-15:00

PI3 kinase ligands LY294002, LY303511 and PI828 block coupling of the 5-HT_{2C} receptor with Ca²⁺ mobilization in a PI3 kinase-independent manner

Ekaterina Dymova

Institute of Cell Biophysics, Russian Academy of Sciences
Russia

15:00-15:45

Overcoming kinase inhibitor resistance and oncogenic RAS signaling

Boris Kholodenko

University College Dublin
Ireland

15:45-16:00

C O F F E E B R E A K

16:00-16:35

Using Microwave radiometry for measuring kinetic constants or New metagenomic methods for drug targets identification

Igor Goryanin

Cluster of Biological and Medical Technologies of the Skolkovo Innovation Center
Russia

16:35-17:05

Processes in the photosynthetic membrane as an object of systems biology

Galina Riznichenko

Lomonosov Moscow State University
Russia

17:05-17:35

Microgravity-induced bone loss: lessons learned from systematic reviews and meta-analysis

Svetlana Komarova

McGill University
Canada

17:35-18:05

A possible mechanism of ligand-receptor binding of short peptides to NaV1.8 channels: a novel approach to development of safe and effective analgesics

Ilya Rogachevskiy

Pavlov Institute of Physiology, Russian Academy of Sciences
Russia

18:05-18:20

Application of machine learning technologies in a non-invasive sensor system for diagnostics of a human functional state

Anna Zaytseva

Institute of Analytical Instrumentation,
Russian Academy of Sciences
Russia

18:20-18:35

C O F F E E B R E A K

18:35-21:15

**BIOLOGICAL SYSTEMS OF THE
SUPRACELLULAR LEVEL:
HEMOSTASIS, IMMUNITY,
NEUROBIOLOGY (PART 2)**

**Chairs: Dmitry Nechipurenko, Russia
Grigorii Panasenko, France**

18:35-19:10

**A new look at the retraction
(contraction) of blood clots and thrombi**

Rustem Litvinov

**University of Pennsylvania
Philadelphia, USA**

19:10-19:45

**Multiscale studies of blood clot
mechanics**

John Weisel

**University of Pennsylvania
Philadelphia, USA**

19:45-20:15

Mathematical modeling of hemodynamics in the left atrium during atrial fibrillation

Grigorii Panasenko

Jean Monnet University of Saint-Etienne
France

20:15-20:45

Couple morphogen-mechanical models for tissue growth and organogenesis

Sergey Nuzhdin

University of Southern California
California, USA

20:45-21:15

Corticotropin-releasing factor (CRF) as a mediator of pain response to stressor: involvement of CRF receptors of subtype 2, opioid receptors and glucocorticoid receptors in CRF-induced analgesic effect in rats

Natalya Yarushkina

Pavlov Institute of Physiology, Russian Academy of Sciences
Russia

AUGUST 27th, 2021

GMT+3

10:00-11:50

PRACTICAL APPLICATIONS OF CELL BIOPHYSICS: ERYTHROCYTES AS CARRIERS OF DRUGS

Chair: Victor Vitvitsky, USA

10:00-10:35

Red blood cells-based drug delivery: new applications and current clinical developments

Mauro Magnani

University of Urbino
Italy

10:35-11:10

Erythrocyte mediated therapy for rare diseases: a complicated affair

Bridget Bax

St. George's University of London
United Kingdom

11:10-11:30

Development of an automatic device for creating drug-loaded erythrocytes

Larisa Koleva

Dmitry Rogachev National Medical
Research Center Of Pediatric
Hematology, Oncology and Immunology
Russia

11:30-11:50

Mathematical modelling of erythrocytes-bioreactors

Eugeny Protasov

Dmitry Rogachev National Medical
Research Center Of Pediatric
Hematology, Oncology and Immunology
Russia

11:50-12:05

C O F F E E B R E A K

12:05-15:10

GENOMICS AND BIOINFORMATICS

**Chairs: Fazly Ataulakhanov, Russia
Artem Efremov, China**

12:05-12:40

mRNA editing in soft-bodied
cephalopods as evolutionary adaptive
functional diversification

Mikhail Gelfand

Skolkovo Institute of Science and
Technology
Russia

12:40-13:15

Reverse genetics and biomedical models
Sergey Nedospasov

Lomonosov Moscow State University
Russia

13:15-13:45

Mechanical equilibrium of the cell nucleus and its potential role in regulation of chromatin structure

Artem Efremov

Institute of Systems and Physical
Biology
China

13:45-14:00

C O F F E E B R E A K

14:00-14:30

Molecular aspects of screening technologies in biodiversity

Alexander Gabibov

M. M. Shemyakin and Yu. A.
Ovchinnikov Institute of Bioorganic
Chemistry of the Russian Academy of
Sciences
Russia

14:30-14:50

Single-cell-resolution transcriptome map of human, chimpanzee, bonobo, and macaque brains

Ekaterina Khrameeva

Skolkovo Institute of Science and
Technology
Russia

14:50-15:10

Dynamics of chromatin folding: lessons learned from single-cell and time-resolved bulk Hi-C data

Alexandra Galitsyna

Skolkovo Institute of Science and Technology
Russia

15:10-19:05

CELLULAR METABOLISM AND ENERGETICS

Chairs: Victor Vitvitsky, USA
Alexander Tikhonov, Russia

15:10-15:40

Virtual cell and theory of metabolic control

Victor Vitvitsky

University of Michigan
Michigan, USA

15:40-16:05

Mapping Mitochondrial Activity in Postmortem Human Brain

Eugene Mosharov

Columbia University
New York, USA

16:05-16:20

Experimental anticancer compound TIC10 induces transformation of BT474 human breast cancer cells to stable stress-state

Artem Mishukov

Institute of Theoretical and Experimental Biophysics, Russian Academy of Sciences
Russia

16:20-16:30

C O F F E E B R E A K

16:30-17:00

Calcium oscillations and autowaves in cells

Valery Zinchenko

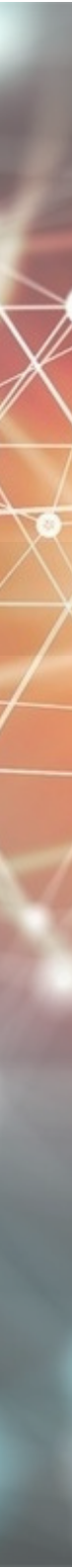
Institute of Cell Biophysics of Russian Academy of Sciences
Russia

17:00-17:30

Structural and functional mechanisms of regulation of light stages in photosynthesis

Alexander Tikhonov

Lomonosov Moscow State University
Russia



17:30-18:05

Signaling through Sulfide

Ruma Banerjee

University of Michigan
Michigan, USA

18:05-18:35

Novel genetically encoded tools for compartment-specific manipulation of NADH/NAD⁺ and NADPH/NADP⁺ ratios in living cells

Valentin Cracan

Scintillon Institute
California, USA

18:35-18:50

The effect of antioxidants on the dynamics of oxidative stress in human sperm

Eugene Bochkov

Lomonosov Moscow State University
Russia

18:50-19:05

Dynamics of structural changes in cryoprotective media for cryopreservation of cells

Anna Ivanova

Lomonosov Moscow State University
Russia

19:05-19:20

C O F F E E B R E A K

19:20-21:20

**BIOLOGICAL SYSTEMS OF THE
SUPRACELLULAR LEVEL:
HEMOSTASIS, IMMUNITY,
NEUROBIOLOGY (PART 3)**

**Chairs: Dmitry Nechipurenko, Russia
Irina Grigorova, USA**

19:20-19:50

Design of potential anti-aggregatory agents and their influence on human platelets activation

Olga Demina

N.M. Emanuel Institute of Biochemical Physics Russian Academy of Sciences
Russia

19:50-20:20

Wandering cells: dissecting spatio-temporal regulation of B cell immune response

Irina Grigorova

University of Michigan Medical School
Michigan, USA

20:20-20:40

The influence of blood clotting on pulmonary circulation

Anastasia Mozokhina

Peoples Friendship University of Russia
Russia

20:40-21:00

Elevated shear rate is not specific to arterial thrombosis, but also relevant to hemostasis

Alexandra Yakusheva

Center for Theoretical Problems of
Physico-Chemical Pharmacology,
Russian Academy of Sciences
Russia

21:00-21:20

Effect of heparin on the formation and healing of stomach ulcers in rats

Denis Sakhno

Pavlov Institute of Physiology, Russian
Academy of Sciences
Russia