

First International Conference  
on Humics-based Innovative Technologies

**«Natural and Synthetic Polyfunctional Compounds  
and Nanomaterials in Medicine  
and Biomedical Technologies»**

Первая международная конференция  
по гуминовым инновационным технологиям

**«Природные и синтетические  
полифункциональные соединения и  
наноматериалы в медицине и  
биомедицинских технологиях»**

November 4-8, 2010, Lomonosov Moscow State University, Moscow, Russia

4-8 ноября 2010 г., МГУ имени М.В. Ломоносова, Москва, Россия

<http://www.humus.ru/hit-2010/>

# Programme

## November 4 Arrival Day

21:30-24:00 Excursion "Moscow at night"

## November 5

09:00-10:00 **Registration of the HiT-2010 participants** (lecture hall 446)

**Opening of the conference / Welcome addresses** (lecture hall 446)

10:00-10:05

**Valery V. Lunin**, Academician of RAS: Greetings from the Dean of the Department of Chemistry of the Lomonosov MSU

10:05-10:10

**Nikolay S. Zefirov**, Academician of RAS: Greetings from the Chair of the Organic Chemistry Division and Institute of Physiologically Active Compounds of RAS

10:10-10:15

**Oskar I. Koifman**, Correspondent Member of RAS, Greetings from the Rector of Ivanovo State Chemical-Technological University

10:15-10:20

**Irina V. Perminova**, Greetings from the Local Organizing Committee

**From Multifunctional Compounds to Multifunctional Drugs**

**Chairs: Dr. Norbert Hertkorn and Dr. Kamila Kydralieva**

10:20-11:00 Invited Lecture

**Vladimir V. Bezuglov** (Institute of Bioorganic Chemistry of RAS, Moscow)  
Hybrid polyfunctional molecules: from concept to multifunctional drugs

11:00-11:40 Invited Lecture

**Philippe Schmitt-Kopplin** (Institute of Ecological Chemistry, Helmholtz-Zentrum Muenchen)

New insights on molecular processes in environment and health with *metabolomics* tools

11:40-12:10 Coffee break

12:10-12:50 Invited Lecture

**Nikolay Melik-Nubarov** (Department of Chemistry, Lomonosov MSU)  
Synthetic macromolecular modulators of drug activity

12:50-13:30

**Irina Perminova** (Department of Chemistry, Lomonosov MSU)

On the path forward to biomedical applications of natural polyfunctional compounds - humic substances

13:30-15:00 Lunch

**Multifunctional Compounds in Therapy and Prophylaxis of Viral Diseases**

**Chairs: Dr. Irina V. Sokolova and Dr. Irina Yu. Vashurina**

15:00-15:40 Invited Lecture

**Edward Karamov** (Ivanovsky Institute of Virology of RAMS, Moscow)

New biomedical approaches to fight HIV-AIDs

15:40-16:00

**Stephan Kremb** (Institute of Virology, Helmholtz-Zentrum Muenchen)

HIV full-replication technology for broad discovery of multiple classes of HIV inhibitors

16:00-16:20

**Georgy Krivtsov** (Mechnikov Institute for Vaccine Development, Moscow)

Chitosans as prospective adjuvants for vaccine development

16:20-16:30

**BashInCom Ltd**, Official Sponsor of the HiT-2010

Large-scale production of biologically active humic preparations: Innovative Enterprise "BashInCom Ltd.", Ufa, Russia

16:30-17:00 Coffee Break

17:00-19:00 Poster Session

19:00-22:00 Get-Together Party

## **November 6**

### **Biological Activity of Humic Substances – Mechanisms and Prospects for Biomedical Applications**

**Chairs: Dr. Olga Yakimenko and Dr. Istvan Gebefuegi**

9:00-9:40 Invited Lecture

**Liliya Stepchenko** (Department of Veterinary and Animal Physiology, Dniepropetrovsk State Agrarian University, Dniepropetrovsk, Ukraine)

The mechanisms of regulatory influence of biologically active substances of humic nature on the organism of animals

9:40-10:20 Invited Lecture

**Alexandrova Olga** (Osnabrueck University – Technical University of Ekaterinburg)

Application of a quantum statistical model of humic substances to their influence on reduction of red cell aggregation in blood

10:20-10:40

**Natalia V. Yudina** (Institute of Petroleum Chemistry, Siberian Branch of RAS, Tomsk)

Biological activity of humic lipids

10:40-12:50 Coffee Break + Internet Break + Poster Session

12:50-13:30 Invited Lecture

**Natalia A. Kulikova** (Department of Soil Science, Lomonosov MSU, Moscow, Russia)

A New Method for Labeling Humic Substances with Tritium: Future Prospects for Biological Studies

13:30-15:00 Lunch

15:00-15:20

### **Natural and Modified Humic Substances – Challenging Candidates for Biomedical Applications**

**Chairs: Dr. Vladimir A. Kholodov and Dr. Elena I. Fedoros**

**Irina V. Sokolova** (Tomsk State University, Tomsk, Russia)

Detoxifying Abilities of Humic Substances: The Influence of UV Pretreatment

15:20-15:40

**Yury V. Zhernov** (Samara State Medical University, Samara, Russia)

Chemotherapeutic effect of humic substances from low mineralized silt sulphide muds on pathogenic and opportunistic microorganisms

15:40-16:00

**Valery N. Babin** (Nesmeyanov Institute of Organoelemental Chemistry RAS, "Ultrasun LLC")

Development of prophylactic-therapeutic system of biologically active food supplement based on restoration of balance in the system "host-microflora"

16:00-16:20

**Alexander I. Popov** (Saint Petersburg University, Saint Petersburg)

The Removal of Stress at Quails by Humic Substances

16:20-16:40

**Tatiana A. Sorkina** (Department of Chemistry, Lomonosov MSU, Moscow, Russia)

Synthesis and Application of Iron-Humic Compounds for Correction of Iron-Deficiency State of Plants

16:40-16:45 Sponsor of the HiT-2010

**"Medbiopharm" LLC** (Obninsk, Kaluga District, Russia)

Center of Innovation Biotechnology and Pharmaceuticals Park of Active Molecules (CIBPh "PAM")

16:45-17:15 Coffee Break

17:15-19:30

### **Panel Discussion**

**Moderators: Dr. Olga S. Yakimenko and Dr. Istvan L. Gebefuegi**

**Round Table:** "Commercial drugs from polyfunctional compounds: myths and reality"

**Moderators: Dr. Alexander I. Popov and Dr. Sergey E. Pigarev**

19:30-21:30 Dinner

## **November 7**

### **In search for molecular structure and biological target of polyfunctional compounds**

**Chairs: Dr. Schmitt-Kopplin and Dr. Eugene N. Nikolaev**

09:00-09:40 Invited Lecture

**Norbert Hertkorn** (Institute of Ecological Chemistry, Helmholtz Zentrum Muenchen, Germany)

High-precision frequency measurements: indispensable tools at the core of molecular-level analysis for linking non-targeted and targeted metabolomics of complex systems

09:40-10:20

**Basem Kanawatti** (Institute of Ecological Chemistry, Helmholtz Zentrum Muenchen, Germany)

Fourier Transform Ion Cyclotron Resonance Mass Spectrometry and Computational Tools in Modern Analytical Chemistry

10:20-10:40

**Anton Grigoriev** (Institute of Biochemical Physics of RAS and Institute of Energy Problem of Chemical Physics of RAS)

Transhumus: Integrated software solution for interpretation of FT-ICR mass spectra of natural organic matter

10:40-11:10 Coffee Break

#### **Poster Presentation Session**

**Chairs: Natalia V. Yudina and Dr. Nina S. Sedyh**

11:10-11:20

**Mourad Harir** (Institute of Ecological Chemistry, Helmholtz Zentrum Muenchen, Germany)

DCMU complex formation as followed with electrospray Fourier transforms ion cyclotron mass spectrometry

11:20-11:30

**Marianna Lucio** (Institute of Ecological Chemistry, Helmholtz Zentrum Muenchen, Germany)

Metabolomic study on possible biomarkers of Crohn's disease

11:30-11:40

**Andrey Konstantinov** (Department of Chemistry, Lomonosov Moscow State University)  
Structural Study of Oxidized Lignin Samples using Size-Exclusion Chromatography, NMR Spectroscopy and Fourier Transform Ion Cyclotron Resonance Mass Spectrometry

11:40-11:50

**Gleb Vladimirov** (Institute of Biochemical Physics of RAS and Institute of Energy Problem of Chemical Physics of RAS)

Combination of high resolution mass-spectrometry (FT-ICR) and nuclear magnetic resonance (NMR) for analysis of mumijo (shilajit)

11:50-12:00

**Michael Kazachkov** (Department of Chemistry, Lomonosov Moscow State University)

Optimization of electrospray ionization conditions for more informative mass spectra in structural research of HS for applications in medicine

12:00-12:10

**Anastasiya Goldt** (Department of Material Science, Lomonosov MSU)

Superparamagnetic Iron Oxide Nanoparticles as MRI contrast agents

12:20-12:30

**Alexander Polyakov** (Department of Material Science, Lomonosov MSU)

Synthesis of Biocompatible Feroxyhyte (d-FeOOH) Magnetic Nanoparticles Using in situ Stabilization with Polyfunctional Humic Macroligands

12:30-14:00 Lunch

**Poster Presentation Session** (continuation)

**Chairs: Dr. Andrey I. Konstantinov and Dr. Anastasiya E. Goldt**

14:00-14:10

**Irina Vashurina** (Ivanovo State Chemical-Technology University, Ivanovo, Russia)  
Prevention of Placental Insufficiency in Rats using Peat Humic Acids

14:10-14:20

**Alexander Volikov** (Department of Chemistry, Lomonosov MSU)  
Synthesis of Adhesive Silanol Derivatives and Their Sorption onto Mineral Support

14:20-14:30

**Evgeniy Garanin** (Department of Chemistry, Lomonosov MSU)  
Synthesis of bioavailable zinc-humic compounds

14:30-14:40

**Alexander Popov** (Saint Petersburg State University, Saint Petersburg)  
Solubilization of Hydrocarbons by Soil Humic Substances

14:40-14:50

**Vladimir Kholodov** (Dokuchaev Soil Science Institute, RAAS)  
Detoxifying Ability of Quinonoid-Enriched Humic Acids with Respect to Copper

14:50-15:00

**Olga Philippova** (Department of Soil Science, Lomonosov MSU)  
Beneficial Effect of Coal Humic Acids and Their Si-enriched Derivative Towards Potatoes and Wheat

15:00-15:10

**Nadezhda Sedykh** (Department of Veterinary and Animal Physiology, Dniepropetrovsk State Agrarian University, Dniepropetrovsk, Ukraine)  
Quantitative Criteria of Biological Activity of New Humics-Based Immunomodulators

15:10-15:20

**Polina Zaitseva** (Ivanovo State Chemical Technology University, Ivanovo)  
Viscous properties of the solutions of copolymers used in the synthesis of polymerporphyrins for medical applications

15:20-15:30

**Evgeniy Molchanov** (Moscow Aviation Institute (Technical University))  
Optimization of production methods of polymeric composite materials based on prepreg technology for precision orthopedic technique

15:30-15:40

**Nadezhda Avvakumova** (Samara State Medical University)  
Modern aspects of medical use of drugs humic peloids sequence

15:40-15:50

**Olga Yakimenko** (Soil Science Department, Lomonosov MSU)  
Comparative Sensitivity of Standard Test-Organisms to Commercial Humates of Different Origin

15:50-16:00 Coffee Break

16:00-17:00

**Closing Remarks. Closure of the conference**

17:00 Departure from the MSU to the Obratsov Muppet Theatre and conference dinner

**November 8, 2010**

10:00-11:00

Reception of the German delegation by the Dean of the Department of Chemistry (TBC)

11:00-12:00

Round Table Discussion: Prospects of Russian-German Cooperation in the field of structure elucidation and biomedical applications of humic substances

12:00-14:00

Excursion in the labs of the Lomonosov Moscow State University

14:00-15:30 Lunch

Departure