Russian Academy of Medical Sciences

119121, Moscow, Pogodinskaya Str., 10

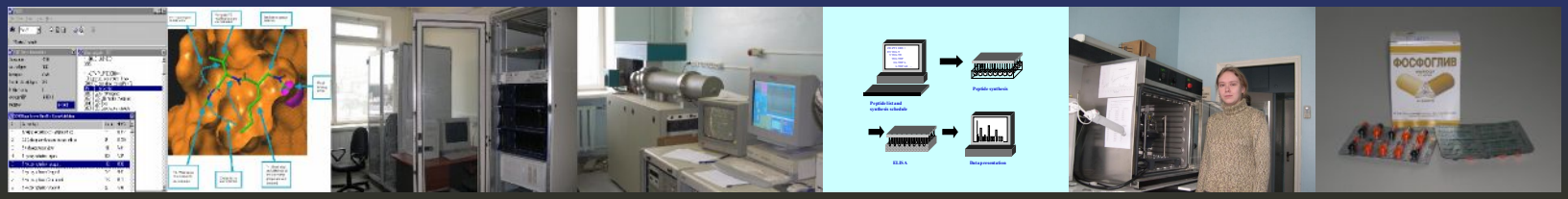
Tel.: +7 495 246-69-80

Fax: +7 495 245-27-53

E-mail: `inst@ibmc.msk.ru`

Web-site: `http://ibmc.msk.ru`

Institute of Biomedical Chemistry



Organized on June 30, 1944.

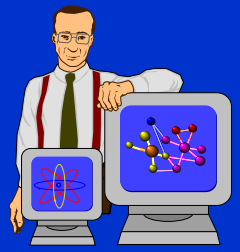
On January 1, 2008 staff consists of ~220 people (~130 researchers), including:

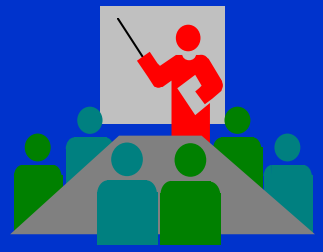
2 - Members of Russian Academy of Medical Sciences

14 - Professors

32 – Dr. Sci.

72 – Ph. D.





IBMC is the Educational & Research Center for undegraduate, graduate and PhD students from:

- ***Medical-Biological Faculty of Rus. State Med. University***
- ***Moscow Medical Academy***
- ***Moscow State University***
- ***and other High Educational Institutions***

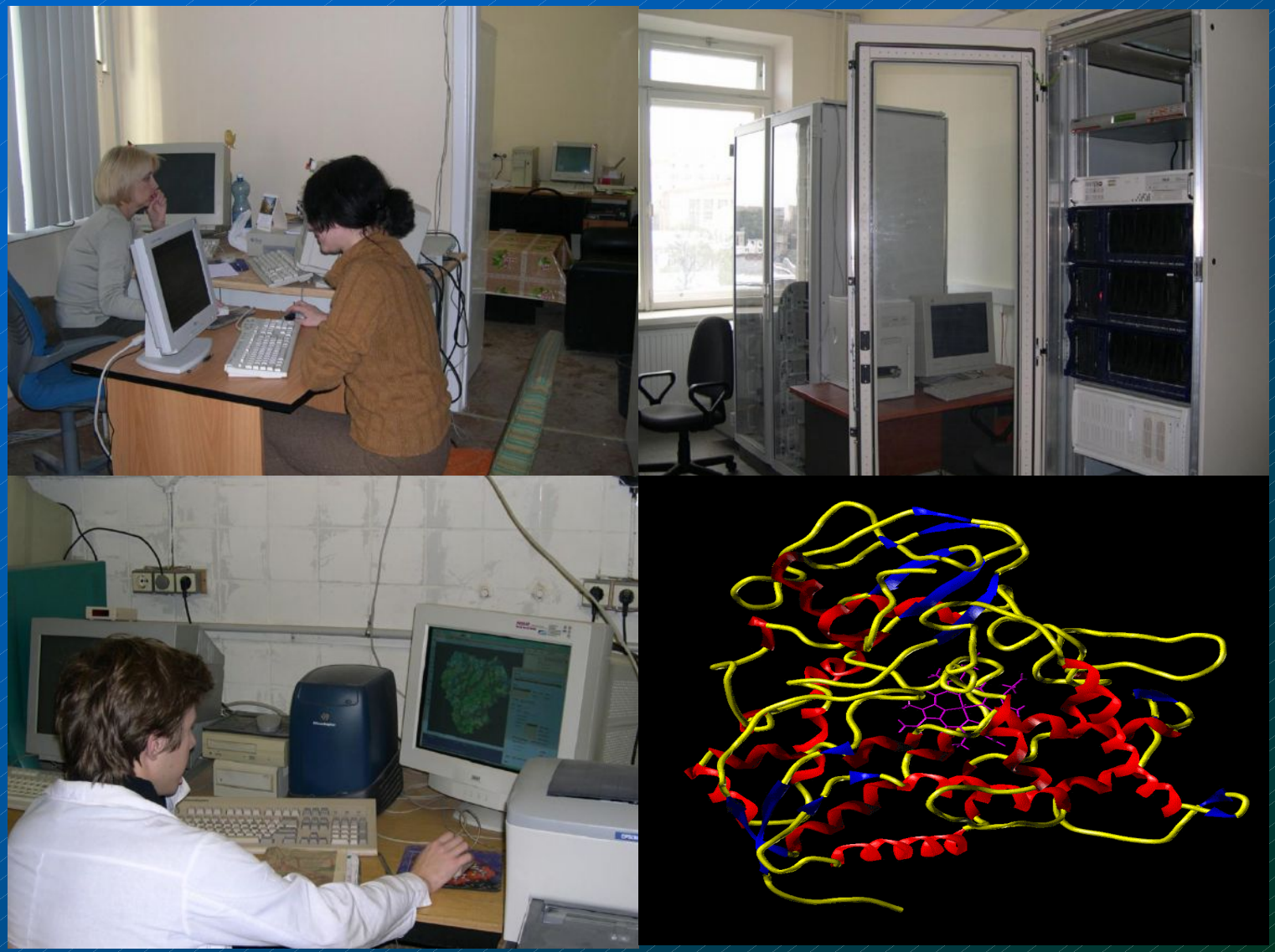
Each year about 25-30 students and 15-20 PhD students take part in the research projects, which are carried out by the Institute.

The Key Lines of the Institute's Activity:

- ✓ OMIC Sciences.
- ✓ Bioinformatics.
- ✓ Nanobiotechnologies.

Postgenomic Studies Are Based on Abilities of Skilled Personnel and Modern Equipment

Bioinformatics Studies: From Genomes to Drug in Silico



Biosensors and Atomic Force Microscopy Are Used for Study of Intermolecular Interactions

JOURNAL OF MOLECULAR RECOGNITION
J. Mol. Recognit. 2001; **14**: 185–196
DOI:10.1002/jmr.532

Optical biosensor investigation of interactions of biomembrane and water-soluble cytochromes P450 and their redox partners with covalently immobilized phosphatidylethanolamine layers

Y. D. Ivanov[1]*, I. P. Kanaeva[1], O. V. Gnedenko[1], V. F. Pozdnev[1], V. V. Shumyantseva[1], N. F. Samenkova[1], G. P. Kuznetsova[1], A. M. Tereza[2], R. D. Schmid[3] and A. I. Archakov[1]

[1]Institute of Biomedical Chemistry RAMS, Moscow 119832, Russia
[2]Institute of Chemical Physics RAS, Moscow, Russia
[3]Institute fur Technische Biochemie, University of Stuttgart, Stuttgart 70569, Germany

A phospholipid-containing biochip was created by covalently immobilizing phospholipids on the optical biosensor's aminosilane cuvette and employed to monitor the interactions of the membrane and water-soluble proteins in cytochrome P450-containing monooxygenase systems with planary layers of dilauroylphosphatidylethanolamine (DLPE) and distearoylphosphatidylethanolamine (DSPE), differing in acyl chain length. It was shown that the full-length membrane proteins—cytochrome P4502B4 (d-2B4), cytochrome b5 (d-b5) and NADPH-cytochrome P450 reductase (d-Fp)—readily incorporated into the phospholipids. The incorporation was largely due to hydrophobic interactions of membranous protein fragments with the phospholipid layer. However, electrostatic forces were also but not always involved in the incorporation process. They promoted d-Fp incorporation but had no effect on d-b5 incorporation. In low ionic strength buffer, no incorporation of these two proteins into the DSPE lipid layer was observable. Incorporation of d-b5 into the DLPE layer was abruptly increased at temperatures exceeding phospholipid phase transition point. Incorporation of d-2B4 was dependent on its aggregation state and decreased with increasing protein aggregability. Water-soluble proteins either would not interact with the phospholipid layer (adrenodoxin) or would bind to the layer at the cost of only electrostatic (albumin) or both electrostatic and hydrophobic (P450cam) interactions.

Review

Alexander I. Archakov[1]
Vadim M. Govorun[1]
Alexander V. Dubanov[1]
Yuri D. Ivanov[1]
Alexander V. Veselovsky[1]
Paul Lewi[2]
Paul Janssen[2]

[1]V. N. Orekhovich Institute of Biomedical Chemistry, Moscow, Russia
[2]Center for Molecular Design, Beerse, Belgium

Protein-protein interactions as a target for drugs in proteomics

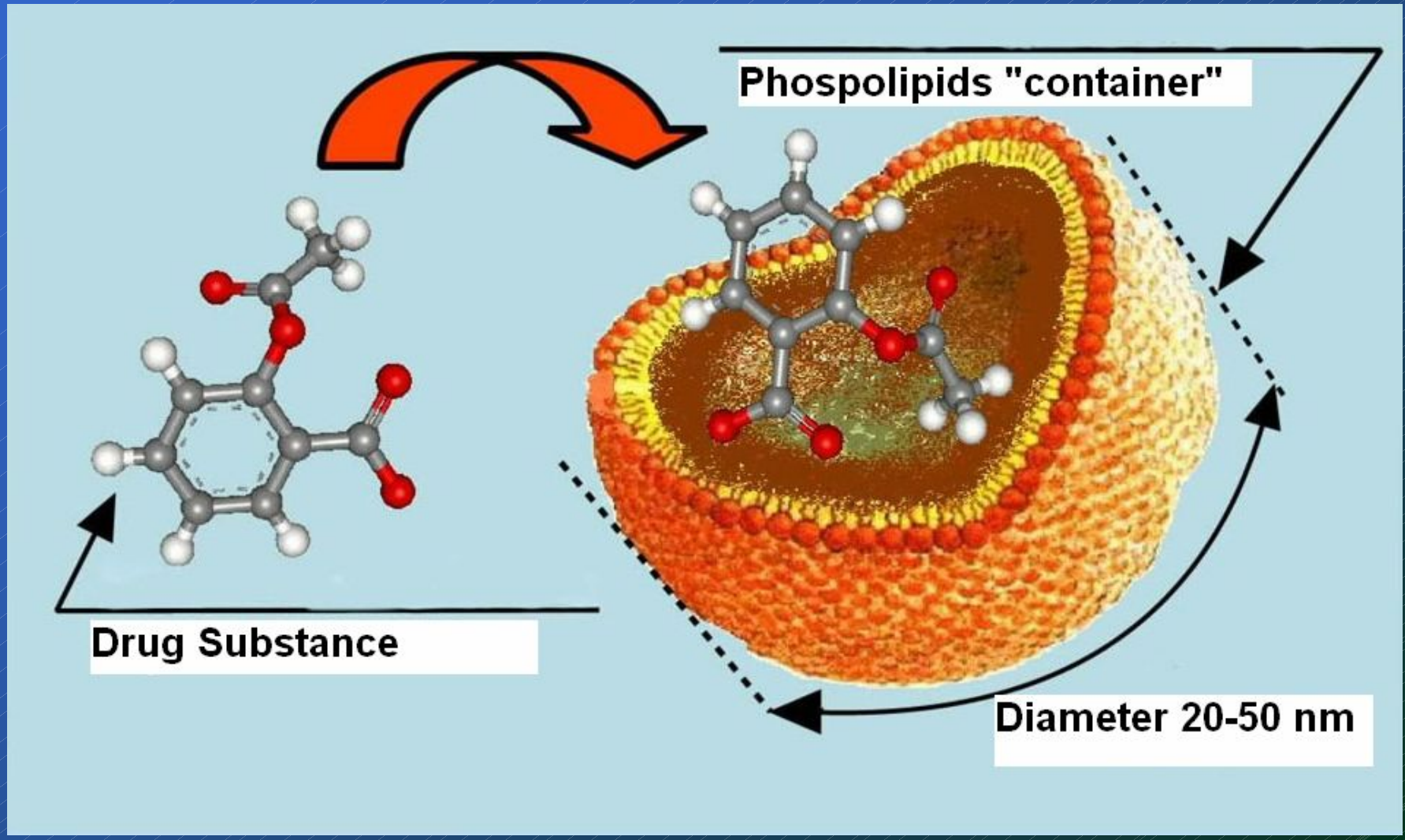
Protein-protein interactions play a central role in numerous processes in the cell and are one of the main fields of functional proteomics. This review highlights the methods of bioinformatics and functional proteomics of protein-protein interaction investigation. The structures and properties of contact surfaces, forces involved in protein-protein interactions, kinetic and thermodynamic parameters of these reactions were considered. The properties of protein contact surfaces depend on their functions. The contact surfaces of permanent complexes resemble domain contacts or the protein core and it is reasonable to consider such complex formation as a continuation of protein folding. Characteristics of contact surfaces of temporary protein complexes share some similarities with active sites of enzymes. The contact surfaces of the temporary protein complexes have unique structure and properties and they are more conservative in comparison with active site of enzymes. So they represent prospective targets for a new generation of drugs. During the last decade, numerous investigations were undertaken to find or design small molecules that block protein dimerization or protein(peptide)-receptor interaction, or, on the contrary, to induce protein dimerization.

Keywords: Bioinformatics / Dimerizers / Inhibitor of protein dimerization / Protein-protein interaction / Review / Target for drugs
PRO 0373

Phosphogliv – Hepatoprotectant with Antiviral Action

(Capsules & Injection Form)

Nano-Phospholip – Drug Delivery System



In 2007 ~95% of the Institute's Revenue Came from Projects, Grants and Contracts:

- ✓ *International Research Grants (ISTC, CRDF, Wellcome Trust, IFTI, Royal Society, INTAS, etc.).*
- ✓ *Federal Agency of Science and Innovations.*
- ✓ *Russian Foundation of Basic Research.*
- ✓ *Moscow Committee of Science and Technologies.*
- ✓ *Agreements and Contracts with Companies.*

Each year ~80 papers are published in peer-reviewed journals:

Zgoda V, Tikhonova O, Viglinskaya A, Serebriakova M, Lisitsa A, Archakov A. Proteomic profiles of induced hepatotoxicity at the subcellular level. Proteomics. 2006, 6(16):4662-70.

Ivanov Y.D., Govorun V.M, Bykov V.A., Archakov A.I. Nanotechnologies in proteomics. Proteomics. 2006, 6(5):1399-414.

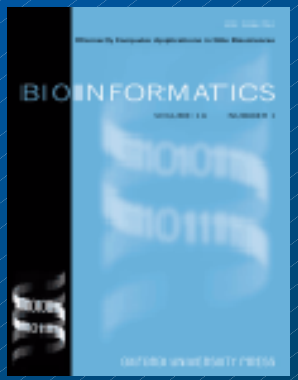
Olenina L.V., Kuzmina T.I., Sobolev B.N., Kuraeva T.E., Kolesanova E.F., Archakov A.I. Identification of glycosaminoglycan-binding sites within hepatitis C virus envelope glycoprotein E2. J. Viral Hepat. 2005, 12(6):584-93

Shumyantseva V.V., Carrara S., Bavastrello V., Jason R.D., Bulko T.V., Skryavin K.G., Archakov A.I., Nicolini C. Direct electron transfer between cytochrome P450scc and gold nanoparticles on screen-printed rhodium-graphite electrodes. Biosens Bioelectron. 2005, 21(1):217-22.

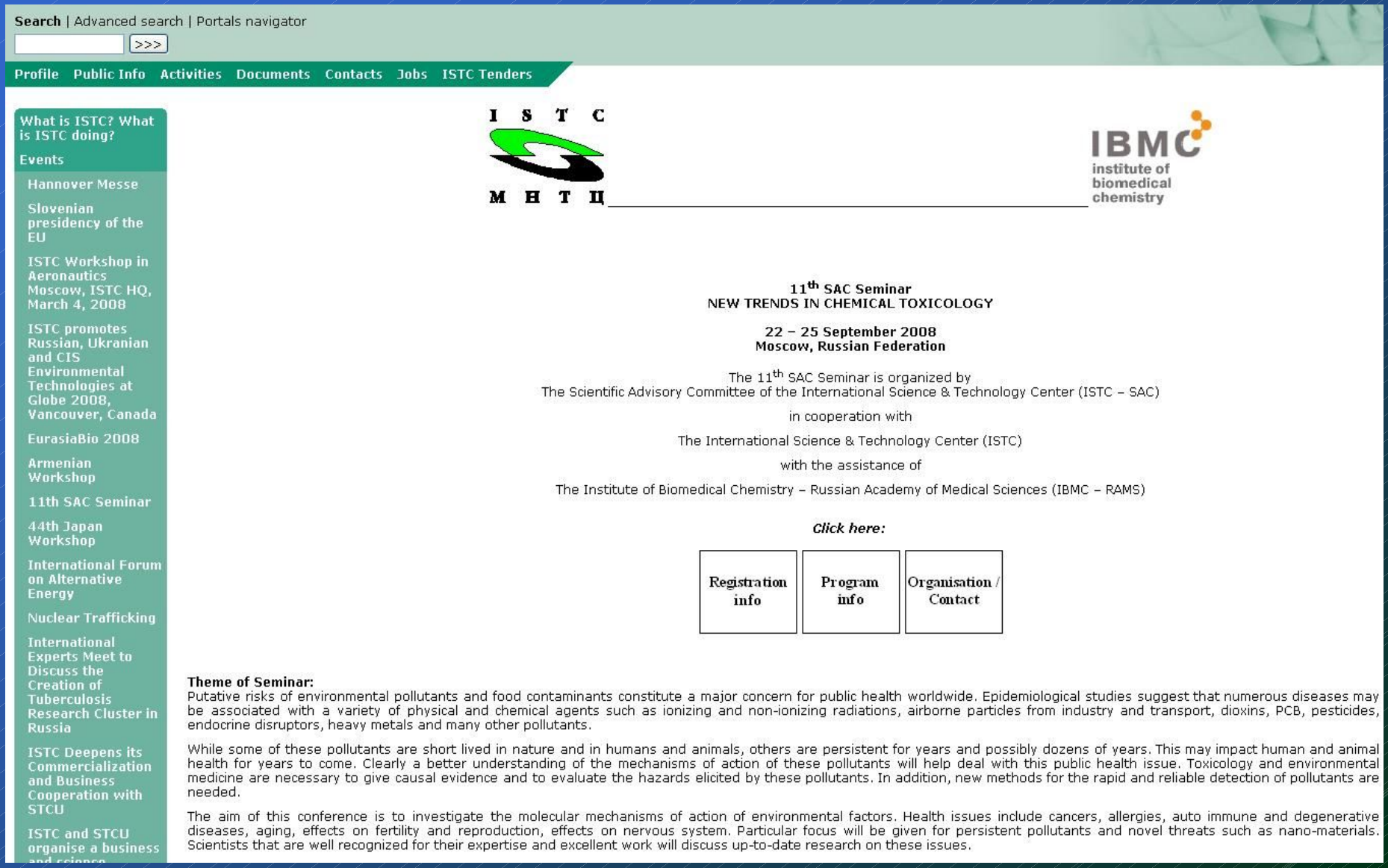
Archakov A.I. et al. Protein-protein interactions as a target for drugs in proteomics. *Proteomics*. 2003; 3 (4), 380-391.

Borodina Yu. et al. Predicting biotransformation potential from molecular structure. *J. Chem. Inform. Comput. Sci.*, 2003, 43 (5), 1636-1646.

. . .



ISTC SAC Seminar, Moscow, Sept. 22-25, 2008



Search | Advanced search | Portals navigator

>>>

Profile Public Info Activities Documents Contacts Jobs ISTC Tenders

- What is ISTC? What is ISTC doing?
- Events
- Hannover Messe
- Slovenian presidency of the EU
- ISTC Workshop in Aeronautics Moscow, ISTC HQ, March 4, 2008
- ISTC promotes Russian, Ukranian and CIS Environmental Technologies at Globe 2008, Vancouver, Canada
- EurasiaBio 2008
- Armenian Workshop
- 11th SAC Seminar
- 44th Japan Workshop
- International Forum on Alternative Energy
- Nuclear Trafficking
- International Experts Meet to Discuss the Creation of Tuberculosis Research Cluster in Russia
- ISTC Deepens its Commercialization and Business Cooperation with STCU
- ISTC and STCU organise a business and science

I S T C
М Н Т Ц

IBMC institute of biomedical chemistry

11th SAC Seminar
NEW TRENDS IN CHEMICAL TOXICOLOGY

22 – 25 September 2008
Moscow, Russian Federation

The 11th SAC Seminar is organized by
The Scientific Advisory Committee of the International Science & Technology Center (ISTC – SAC)

in cooperation with

The International Science & Technology Center (ISTC)

with the assistance of

The Institute of Biomedical Chemistry – Russian Academy of Medical Sciences (IBMC – RAMS)

Click here:

Registration info	Program info	Organisation / Contact

Theme of Seminar:
Putative risks of environmental pollutants and food contaminants constitute a major concern for public health worldwide. Epidemiological studies suggest that numerous diseases may be associated with a variety of physical and chemical agents such as ionizing and non-ionizing radiations, airborne particles from industry and transport, dioxins, PCB, pesticides, endocrine disruptors, heavy metals and many other pollutants.

While some of these pollutants are short lived in nature and in humans and animals, others are persistent for years and possibly dozens of years. This may impact human and animal health for years to come. Clearly a better understanding of the mechanisms of action of these pollutants will help deal with this public health issue. Toxicology and environmental medicine are necessary to give causal evidence and to evaluate the hazards elicited by these pollutants. In addition, new methods for the rapid and reliable detection of pollutants are needed.

The aim of this conference is to investigate the molecular mechanisms of action of environmental factors. Health issues include cancers, allergies, auto immune and degenerative diseases, aging, effects on fertility and reproduction, effects on nervous system. Particular focus will be given for persistent pollutants and novel threats such as nano-materials. Scientists that are well recognized for their expertise and excellent work will discuss up-to-date research on these issues.