

## INTERNATIONAL CONFERENCE

# Physics of cancer: interdisciplinary problems and clinical applications

March 22-25, 2016

Tomsk, Russia

## Conference Program

### ORGANIZERS

Federal Agency for Scientific Organizations  
Institute of Continuous Media Mechanics UB RAS,  
Perm, Russia  
Institute of Strength Physics and Materials Science SB RAS,  
Tomsk, Russia  
Tomsk State University, Tomsk, Russia  
National Research Polytechnic University, Perm, Russia  
Siberian State Medical University, Tomsk, Russia  
Siberian Branch of the Russian Academy of Sciences  
Ural Branch of the Russian Academy of Sciences  
Ecole Normale Supérieure de Lyon, Lyon, France  
University of Leipzig, Institute of Experimental Physics,  
Leipzig, Germany

Tomsk Polytechnic University, Tomsk, Russia  
Acad. Herten Research Oncology Institute, Moscow, Russia  
Perm State Academy of Medicine named after Acad. E.A. Wagner,  
Perm, Russia  
Technion-Israel Institute of Technology, Haifa, Israel  
Jožef Stefan Institute, Ljubljana, Slovenia  
Institut Curie, Paris, France  
Pierre and Marie Curie University, Paris, France  
Institute of Molecular Genetics, Montpellier, France  
Institute for Biophysics, Bremen, Germany  
Technology Platform "Medicine of the Future", Russia  
Tomsk Cancer Research Institute, Russia  
Skolkovo Institute of Science and Technology, Russia  
Innovative territorial center "INO Tomsk"

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## **OBJECTIVES**

A transdisciplinary Conference “Physics of Cancer: Interdisciplinary Problems and Clinical Applications” is organized in succession of the Trilateral Russia-Germany-France Workshop “Oncology: on the Frontiers of Molecular Genetics, Biophysics and Medicine, June 5-8, 2012, Perm, Russia”. It aims at gathering researchers working in the fields of physics of cancer, of biophysics and medicine to discuss challenging approaches for cancer risk determination.

Cancer has been shown to be related to genetic mutations that could facilitate cellular escape from homeostatic tissue control. The subsequent growth and progression of a tumor is an inherently multi-scale process. At the sub-cellular level, despite the fact that the nucleus is one of the most important components of the cell, little is known about the contribution of the nuclear shape and size to the mechanical regulation of the genome function. The physical coupling between chromatin architecture and various nuclear and cytoplasmic scaffolds remains poorly understood. Concepts and methods of mechanobiology will be used to study physical factors involved in the process of mechanotransduction, as the ability to sense the forces and physical environment at the cell and tissue. Mechanobiology, based on a multi-disciplinary expertise from molecular, cellular and tissue biology, from mathematics, computational modeling, physics, physical chemistry, biophysics and engineering will help in understanding mechanical functions across molecular, cellular and tissular levels. Among the key issues that will be addressed in this workshop, special focus will be on modern methods of spatio-temporal analysis of various biological and medical signals including those issued from molecular-genetic studies, mammography and infrared data, as well as images from different high resolution microscopies (e.g. confocal microscopy, atomic force microscopy, scanning electron microscopy, scanning surface potential microscopy). Concepts, methodologies, numerical and experimental techniques coming from statistical mechanics and nonlinear physics combined with multi-scale signal processing will be discussed with the specific goal to establish some correlation between clinic stages of tumor progression and biomechanical markers.

## **MAIN TOPICS**

- Current transdisciplinary issues in cancer diagnosis and treatment
- Cell biology and cell mechanics and their impact on cancer progression
- New technologies and theoretical models for cancer research
- Mechano-genetics of the cell: application to embryonic and tumor development
- Multi-scale analysis and modeling of genomic, epigenetic and microscopy data, methodology and application to cancer
- Application of molecular genetics technology and biophysics methods in target therapy and cancer risk estimation
- Modern materials and diagnosis methods for cancer treatment
- Cancer nanotechnology
- Materials / implants for reconstructive oncology

## **REGISTRATION**

Registration of the conference participants and guests will take place on March 22 (Tuesday) from 08.00 a.m. to 10.00 a.m. and March 23 (Wednesday) from 08.00 a.m. to 9.00 a.m. at the hall of TPU International Culture Center (13 Usova Street).

## **PRESENTATION OF REPORTS**

The conference will consist of oral and poster sessions. Simultaneous interpretation will be provided at the conference sessions. Oral presentations will be limited to 20 min (including discussion); computer projectors will be available. The size of poster presentations should be 60×80 cm. Computer and poster presentations must be prepared in English.

**OFFICIAL LANGUAGES** will be Russian and English.

## SCHEDULE

**March 22, 2016 (Tuesday)**

(TPU International Culture Center, 13 Usova Street)

- 08:00 – 10:00 Registration**
- 10:00 – 10:15 Conference opening ceremony**
- 10:15 – 14:00 Plenary session**
- Co-Chairmen: O.B. Naimark, N.V. Cherdyntseva**
- 10:15 – 10:45 **Mikhail Popov** (Tomsk Polytechnic University, Tomsk, Russia) (plenary report)  
**Ant Civilization**
- 10:45 – 11:15 **Annick Lesne** (CNRS, LPTMC, Paris, IGMM, Montpellier, France) (plenary report)  
**Physics of cancer: multiscale insights on cancer progression**
- 11:15 – 11:45 **Oleg Borisovich Naimark** (Institute of Continuous Media Mechanics UB RAS, Perm, Russia) (plenary report)  
**Multiscale Simulation of Biological Systems and Some Applications in Oncology.**
- 11:45 – 12:15 **Alain Arneodo** (Université de Bordeaux, France) (plenary report)  
**Genome-wide alterations of the DNA replication program during tumor progression**
- 12:15 – 12:30 Coffee break**
- 12:30 – 13:00 **Vladimir Ivanovich Chernov<sup>1,2</sup>, A.A. Medvedeva<sup>1,2</sup>, R.V. Zelchan<sup>1,2</sup>, I.G. Sinilkin<sup>1,2</sup>, E.S. Stasyuk<sup>2</sup>, L.A. Larionova<sup>2</sup>, E.M. Slonimskaya<sup>1</sup>, E.L. Choynzonov<sup>1</sup>** (<sup>1</sup>Tomsk Cancer Research Institute, <sup>2</sup>Tomsk Polytechnic University, Tomsk, Russia) (plenary report)  
**Use of Radiopharmaceuticals in Scintigraphic Visualization of Cancer**
- 13:00 – 13:30 **Dmitry Olegovich Zharkov<sup>1,2</sup>, A.V. Endutkin<sup>1,2</sup>, A.P. Dovgerd<sup>1,2</sup>, A.V. Popov<sup>1</sup>, I.R. Grin<sup>1,2</sup> and G.V. Mechetin<sup>1</sup>** (<sup>1</sup>SB RAS Institute of Chemical Biology and Fundamental Medicine, <sup>2</sup>Novosibirsk State University, Novosibirsk, Russia) (plenary report)  
**DNA Repair and Active Demethylation: A New Cancer Epigenetic Connection**
- 13:30 – 14:00 **Nadezhda Victorovna Cherdyntseva<sup>1,2</sup>, N. Litviakov<sup>1,2</sup>, E. Denisov<sup>1,2</sup>, M. Zavyalova<sup>1,3</sup>, M. Stakheyeva<sup>1</sup>, J. Kzhyshkowska<sup>2</sup>, V. Perelmutter<sup>1,3</sup>** (<sup>1</sup>Tomsk Cancer Research Institute, <sup>2</sup>Tomsk State University, <sup>3</sup>Siberian State Medical University, Tomsk, Russia) (plenary report)  
**The Molecular Aspects of Personalized Anticancer Treatment**
- 14:00 – 15:00 Lunch**
- 15:00 – 18:00 Tomsk sightseeing guided tour**

## March 23, 2016 (Wednesday)

(TPU International Culture Center, 13 Usova Street)

**08:00 – 09:00 Registration**

**Co-Chairmen: A. Lesne, V.I. Chernov**

09:00 – 09:30 **Carmela Rianna and Manfred Radmacher** (Institut für Biophysik, Universität Bremen, Germany) (plenary report)  
**The mechanical phenotype of cancer cells**

09:30 – 10:00 **Alexis Gautreau** (Ecole Polytechnique, Palaiseau, France) (plenary report)  
**Loss of a Novel Branched Actin Checkpoint in Cancer Cells**

10:00 – 10:30 **Francoise Argoul** (Ecole Normale Supérieure de Lyon, Lyon, Université de Bordeaux, France) (plenary report)  
**Revealing the Increased Internal Complexity of Cancer Cells with Quantitative Phase Microscopy**

**10:30 – 10:50 Coffee break**

10:50 – 11:20 **Sergey Nikolaevich Kulkov** (ISPMS.SB RAS) (plenary report)  
**Zirconia-Based Sintered Ceramics for Biomedical Applications**

11:20 – 11:50 **Elazar Gutmanas** (Department of Materials Science & Engineering, Technion - Israel Institute of Technology Haifa, Israel) (plenary report)  
**Iron oxide and gold nanoparticles in cancer therapy**

**11:50 – 13:00 Poster session**

**13:00 – 14:00 Lunch**

**Co-Chairmen: M. Radmacher, E. Gutmanas**

14:00 – 14:20 **Ludmila Victorovna Spirina<sup>1,2</sup>, Y.A. Usynin<sup>1</sup>, I.V. Kondakova<sup>1</sup>, Z.A. Yurmazov<sup>1</sup>, E.M. Slonimskaya<sup>1,2</sup>** (<sup>1</sup>Tomsk Cancer Research Institute, <sup>2</sup>Siberian State Medical University, Tomsk, Russia)  
**Small renal masses: the molecular markers associated with outcome of patients with kidney tumors 7 cm or less**

14:20 – 14:40 **Anastasiya Igorevna Ryabova<sup>1</sup>, V.A. Novikov<sup>1</sup>, E.L. Choinzonov<sup>1,3</sup>, O.V. Gribova<sup>1,2</sup>, Zh.A. Startseva<sup>1</sup>** (<sup>1</sup>Tomsk Cancer Research Institute, <sup>2</sup>National Research Tomsk Polytechnic University, <sup>3</sup>Siberian State Medical University, Tomsk, Russia)  
**Local Hyperthermia in Malignant Glioma Treatment**

14:40 – 15:00 **Marina Nikolaevna Stakheeva<sup>1</sup>, D. Eidenzon<sup>2</sup>, N. Cherdyntseva<sup>1</sup>, E. Slonimskaya<sup>1</sup>, E. Cherdyntsev<sup>3</sup>** (<sup>1</sup>Tomsk Cancer Research Institute, Tomsk, Russia, <sup>2</sup>NovoSpark Corporation, Waterloo, Ontario, Canada, <sup>3</sup>National Research Tomsk Polytechnic University, Tomsk, Russia)  
**Multidimensional Visualization for the Immune System State Presentation in Breast Cancer Patients**

15:00 – 15:20 **Ivan Gennad'evich Sinilkin, V.I. Chernov, E.M. Slonimskaya, L.A. Kolomiets, R.V. Zelchan, A.A. Medvedeva, A.Yu. Lyapunov, O.D. Bragina, N.V. Varlamova, V.S. Skuridin** (Tomsk Cancer Research Institute, Tomsk, Russia)  
Development and first clinical experience with a new domestic radiopharmaceutical <sup>99m</sup>Tc-aluminum oxide, gamma for imaging sentinel

lymph nodes in malignant tumors

- 15:20 – 15:40 **Gelena Valerievna Kakurina<sup>1</sup>, E.S. Kolegova<sup>1</sup>, I.V. Kondakova<sup>1</sup>, O.V. Cheremisina<sup>1</sup>, A.A. Zavyalov<sup>1,2</sup>, D.A. Shishkin<sup>1,2</sup>, E.L. Choinzonov<sup>1,2</sup>** (<sup>1</sup>Tomsk Cancer Research Institute, <sup>2</sup>Siberian State Medical University, Tomsk, Russia)  
**Adenylyl Cyclase-Associated Protein 1 in Metastasis of Squamous Cell Carcinoma of Head and Neck Cancer and Non-Small Cell Lung Cancer**
- 15:40 – 16:00 **Coffee break**
- 16:00 – 16:20 **Elena Arkadievna Lyapunova<sup>1,2</sup>, A. Nikituk<sup>1</sup>, Yu. Bayandin<sup>1</sup>, O. Naimark<sup>1</sup>, C. Rianna<sup>3</sup>, M. Radmacher<sup>3</sup>** (<sup>1</sup>Institute of Continuous Media Mechanics, Perm, <sup>2</sup>Ural Federal University, Ekaterinburg, Russia, <sup>3</sup>University of Bremen, Institute of biophysics, Bremen, Germany)  
**Multifractal Detrended Fluctuation Analysis of Atomic Force Microscopy Data Obtained on Living Cells**
- 16:20 – 16:40 **Irina Victorovna Kondakova<sup>1</sup>, N.V. Yunusova<sup>1,2</sup>, L.V. Spirina<sup>1,2</sup>, E.E. Shashova<sup>1</sup>, E.S. Kolegova<sup>1</sup>, L.A. Kolomiets<sup>1</sup>, E.M. Slonimskaya<sup>1,2</sup>, A.B. Villert<sup>1</sup>** (<sup>1</sup>Tomsk Cancer Research Institute, <sup>2</sup>Siberian State Medical University, Tomsk, Russia)  
**Locomotor Proteins in Tissues of Primary Tumors and Metastases of Ovarian and Breast Cancer**
- 16:40 – 17:00 **Dmitry Anatolievich Bratsun<sup>1</sup>, A.P. Zakharov<sup>2</sup>, L. Pismen<sup>2</sup>** (<sup>1</sup>Perm National Research Polytechnic University, Perm, Russia, <sup>2</sup>Technion - Israel Institute of Technology, Haifa, Israel)  
**Chemo-Mechanical Modeling of Tumor Growth in Elastic Epithelial Tissue**
- 17:00 – 17:20 **Evgeny Vladimirovich Denisov<sup>1,2</sup>, T.S. Gerashchenko<sup>1,2</sup>, L.A. Tashireva<sup>1</sup>, D.N. Pautova<sup>2</sup>, M.V. Zavyalova<sup>1,2,3</sup>, N.V. Cherdyntseva<sup>1,2</sup>, V.M. Perelmuter<sup>1,3</sup>** (<sup>1</sup>Tomsk Cancer Research Institute, <sup>2</sup>Tomsk State University, <sup>3</sup>Siberian State Medical University, Tomsk, Russia)  
**The epithelial-mesenchymal transition (EMT) spectrum in breast cancer: a correlation with intratumor morphological diversity**
- 17:20 – 17:40 **Natalia Valerievna Yunusova<sup>1,2</sup>, S.N. Tamkovich<sup>3,4</sup>, M.N. Stakheeva<sup>1</sup>, S.G. Afanas'ev<sup>1</sup>, A.Y. Frolova<sup>2</sup>, I.V. Kondakova<sup>1</sup>** (<sup>1</sup>Tomsk Cancer Research Institute, <sup>2</sup>Siberian State Medical University, Tomsk, <sup>3</sup>Institute of Chemical Biology and Fundamental Medicine SB RAS, <sup>4</sup>Novosibirsk State University, Novosibirsk, Russia)  
**The Characterization of Exosome from Blood Plasma of Patients with Colorectal Cancer**
- 18:00 – 22:00 **Banquet**

## March 24, 2016 (Thursday)

(TPU International Culture Center, 13 Usova Street)

**Co-Chairmen: I.A. Kirilova, E.I.Gerasimova**

- 09:00 – 09:20 **Yu.E. Geints, A.A. Zemlyanov, Ekaterina Konstantinovna Panina** (Zuev Institute of Atmospheric Optics SB RAS, Tomsk, Russia)  
**The investigation of the optimal conditions thermal destruction of the microcapsules containing water by laser pulses**
- 09:20 – 09:40 **Sergey Valerievich Mishinov** (Novosibirsk Research Institute of Traumatology and Orthopaedics, Novosibirsk, Russia)  
**Cytotoxic activity of interferon Alpha Induced Dendritic Cells as a biomarker of Glioblastoma**
- 09:40 – 10:00 **Yury Vladimirovich Kistenev<sup>1,2</sup>, A.V. Borisov<sup>1</sup>, D.A. Kuzmin<sup>2</sup>, A.A. Bulanov<sup>1</sup>** (<sup>1</sup>National Research Tomsk State University, <sup>2</sup>Siberian State Medical University, Tomsk, Russia)  
**The Classification of the Patients with Pulmonary Diseases Using Breath Air Samples Spectral Analysis**
- 10:00 – 10:20 **Evgeniya Igorevna Chechkina<sup>1</sup>, B. Toner<sup>2</sup>, K. Batchelder<sup>2</sup>, A. Khalil<sup>2</sup>, A. Arneodo<sup>3,4</sup>, F. Argoul<sup>3,4</sup>, B. Audit<sup>4</sup>, S.G. Roux<sup>4</sup>, O. Gileva<sup>5</sup> and O. Naimark<sup>1</sup>** (<sup>1</sup>Institute of Continuous Media Mechanics UB RAS, Perm, Russia, <sup>2</sup>University of Maine, Maine, USA, <sup>3</sup>Université de Bordeaux, France, <sup>4</sup>ENS de Lyon, Université de Lyon, France, <sup>5</sup>Perm State Medical University named after ac. E.A. Wagner, Perm, Russia)  
**Adaptation of Multifractal Analysis for Breast Cancer Identification in Digital Mammograms and Infrared Thermograms**
- 10:20 – 10:40 **S.N. Kulkov<sup>1</sup>, S.P. Buykova<sup>1</sup>, Denis Evgenievich Kulbakin<sup>1,2</sup>** (<sup>1</sup>Tomsk State University, <sup>2</sup>Tomsk Cancer Research Institute, Tomsk, Russia)  
**Development of the Method Individual Reconstruction of Maxillofacial Defects Using Bioactive Ceramics Implants**
- 10:40 – 11:00 Coffee break**
- 11:00 – 11:20 **D.V. Ryzhikov, Elena Vladimirovna Gubina, V.T. Podorozhnaya, M.A. Sadovoy** (Research Institute of Traumatology and Orthopedics n.a. Ya.L. Tsivyan, Novosibirsk, Russia)  
**Replacement of the Defect and Osteosynthesis of Diaphyseal Defects Osteoblastoklastome Long Bones in Children**
- 11:20 – 11:40 **Marina Vasilievna Chaikina<sup>1</sup>, E.G. Komarova<sup>2</sup>, Yu.P. Sharkeev<sup>2</sup>, N.V. Bulina<sup>1</sup>, I.Yu. Prosanov<sup>1</sup>** (<sup>1</sup>Institute of Solid State Chemistry and Mechanochemistry SB RAS, Novosibirsk, <sup>2</sup>Institute of Strength Physics and Materials Science SB RAS, Tomsk, Russia)  
**Lanthanum-Silicon-substituted Hydroxyapatite: Mechanochemical Synthesis and Prospects for Medical Applications**
- 11:40 – 12:00 **Ekaterina Gennadievna Komarova<sup>1</sup>, M.V. Chaikina<sup>2</sup>, M.B. Sedelnikova<sup>1</sup>, Y.P. Sharkeev<sup>1</sup>** (<sup>1</sup>Institute of Strength Physics and Materials Science SB RAS, Tomsk, Russia, <sup>2</sup>Institute of Solid State Chemistry and Mechanochemistry SB RAS, Novosibirsk, Russia)  
**Structure and Properties of La- and Si-incorporated Calcium Phosphate Coatings**



- 12:00 – 12:20 **Alexander Anatolevich Kozulin<sup>1</sup>, A.S. Narikovich<sup>2</sup>, S.N. Kulkov<sup>1,3</sup>, V.N. Leitsin<sup>2</sup>** (<sup>1</sup>National Research Tomsk State University, Tomsk, Russia, <sup>2</sup>Immanuel Kant Baltic Federal University, Kaliningrad, Russia, <sup>3</sup>Institute of Strength Physics and Materials Science of Siberian Branch Russian Academy of Sciences, Tomsk, Russia)  
**Experimental Investigations of Strength Properties, Fatigue Behavior and Damage Formation of ZrO<sub>2</sub>-based Ceramics**
- 12:20 – 12:40 **Oleg Victorovich Kokorev, V.N. Hodorenko, V.E. Gunther** (Tomsk State University, Tomsk, Russia)  
**Antitumor Immunomodulatory Activity Allogenic Bone Marrow Cells on Scaffold of TiNi**
- 12:40 – 13:00 **Ludmila Leonidovna Meisner<sup>1,2</sup>, V.M. Matveeva<sup>3</sup>, S.N. Meisner<sup>1,2</sup>, A.L. Matveev<sup>4</sup>, E.Yu. Gudimova<sup>1,2</sup>, O.I. Shabalina<sup>1</sup>** (<sup>1</sup>Institute of Strength Physics and Materials Science SB RAS, <sup>2</sup>National Research Tomsk State University, Tomsk, <sup>3</sup>Institute of Chemical Biology and Fundamental Medicine SB RAS, Novosibirsk, Russia)  
**Effects Of Surface Chemistry, Topography, And Structure Of Ion Modified TiNi Biomaterial On Stem Cell Behavior**
- 13:00 – 14:00 Lunch**
- Co-Chairmen: A. Gautreau, D.O. Zharkov**
- 14:00 – 14:20 **Aleksander Gennadjevich Popov<sup>1</sup>, V.A. Kovalev<sup>1</sup>, I.I. Anisenya<sup>2</sup>, D.V. Mitrichenko<sup>1</sup>, A.B. Prosolov<sup>1</sup>, I.A. Khlusov<sup>1</sup>** (<sup>1</sup>OOO «NPK «SINTEL», <sup>2</sup>Tomsk Cancer Research Institute, Tomsk, Russia)  
**3D-modeling in the production of custom-made implants**
- 14:20 – 14:40 **Alla Mikhailovna Zaydman** (Novosibirsk Research Institute of Traumatology and Ortopaedics n.a. Ya. L. Tsivyan, Novosibirsk, Russia)  
**Osteograft – Plastic Material for Regenerative Medicine**
- 14:40 – 15:00 **Irina Anatolievna Kirilova, V.T. Podorozhnaya, N.Yu. Pochueva, P.A. Zheleznyĭ** (Novosibirsk Research Institute of Traumatology and Ortopaedics n.a. Ya. L. Tsivyan, Novosibirsk, Russia)  
**Morphological Presentation of Osteogenesis in Experimental Application of KOSTMA Osteoplastic Material**
- 15:00 – 15:20 **Petr Mikhailovich Larionov** (Novosibirsk Research Institute of Traumatology and Ortopaedics n.a. Ya. L. Tsivyan, Novosibirsk, Russia)  
**Tissue-engineering design for the replacement of bone defects with optical control based on laser-induced fluorescence (LIF) spectroscopy**
- 15:20 – 15:40 **Sergei Ivanovich Tverdokhlebov<sup>1</sup>, E.N. Bolbasov<sup>1</sup>, N.V. Cherdyntseva<sup>2</sup> and E.L. Choinzonov<sup>2</sup>** (<sup>1</sup>Tomsk Polytechnic University, <sup>2</sup>Tomsk Cancer Research Institute, Tomsk, Russia)  
**Composite Implants for Craniofacial Reconstruction in Cancer Patients**
- 15:40 – 16:00 Coffee break**
- 16:00 – 18:00 The Botanical Garden excursion**

## March 25, 2016 (Friday)

(Main building of ISPMS SB RAS, 2/4 pr. Akademicheskii)

**Co-Chairmen: S.N. Kulkov, E.A. Lyapunova**

- 09:00 – 09:20 **Denis Evgenievich Kulbakin<sup>1,2</sup>, E.L. Choinzonov<sup>1</sup>, M.R. Mukhamedov<sup>1</sup>, E.U. Garbukov<sup>1</sup>, V.I. Shtin<sup>1</sup>** (<sup>1</sup>Tomsk Cancer Research Institute, <sup>2</sup>Tomsk State University, Tomsk, Russia)  
**Modern Principles of Reconstructive Surgery for Advanced Head and Neck Tumors**
- 09:20 – 09:40 **Tatyana Yuryevna Sablina<sup>1</sup>, A.D. Pshenichnyj<sup>2</sup>, N.L. Savchenko<sup>1,2,3</sup>, S.P. Buyakova<sup>1,2,3</sup> and S.N. Kulkov<sup>1,2,3</sup>** (<sup>1</sup>Institute of Strength Physics and Materials Science SB RAS, <sup>2</sup>National Research Tomsk State University, <sup>3</sup>National Research Tomsk State Polytechnic University, Tomsk, Russia)  
**Mechanical Behavior of a Ceramic/Polyethylene Sandwich-Structured Composite for Reconstructive Oncology**
- 09:40 – 10:00 **Nikolaj Leonidovich Savchenko<sup>1,2,3</sup>, T.Yu. Sablina<sup>1</sup>, I.N. Sevostyanova<sup>1</sup>, A.D. Pshenichnyj<sup>2</sup>, S.P. Buyakova<sup>1,2,3</sup> and S.N. Kulkov<sup>1,2,3</sup>** (<sup>1</sup>Institute of Strength Physics and Materials Science SB RAS, <sup>2</sup>National Research Tomsk State University, <sup>3</sup>National Research Tomsk State Polytechnic University, Tomsk, Russia)  
**The Porous Zirconia-Alumina Based Ceramics for Implants**
- 10:00 – 10:20 **Victor Victorovich Rerikh, A.R. Avetisyan, A.M. Zaidman, K.A. Anikin, V.A. Bataev, A.A. Nikulina, M.A. Sadovoy, A.M. Aronov, E.S. Semantsova** (Research Institute of Traumatology and Orthopedics n.a. Ya.L. Tsivyan, Novosibirsk, Russia)  
**Osseointegration of Alumina Bioceramic Granules: Comparative Experimental Study**
- 10:20 – 10:40 **Viacheslav Alexandrovich Bazlov** (Research Institute of Traumatology and Orthopedics n.a. Ya.L. Tsivyan, Novosibirsk, Russia)  
**The use of modern materials in the manufacture scaffolds in order to replace bone defects**
- 10:40 – 11:00 **S.I. Tverdokhlebov<sup>1</sup>, Olga Vasilievna Kolokolova<sup>2,3</sup>, N.V. Cherdyntseva<sup>4</sup>, and E.L. Choinzonov<sup>4</sup>** (<sup>1</sup>National Research Tomsk Polytechnic University, <sup>2</sup>Institute of Strength Physics and Materials Science SB RAS, <sup>3</sup>Technology Platform “Medicine of the Future”, Science Board “Promising medical materials”, <sup>4</sup>Tomsk Cancer Research Institute SB RAS, Tomsk, Russia)  
**Marketing Advantages of Composite Implants for Reconstructive Surgery of Craniofacial Area in Oncology**
- 11:00 – 11:20 **Nikolai Vasilievich Litviakov<sup>1</sup>, V.M. Perelmuter<sup>1</sup>, S.I. Tverdokhlebov<sup>2</sup>, D.E. Kulbakin<sup>1</sup>, E.N. Bolbasov<sup>2</sup>, N.V. Cherdyntseva<sup>1</sup>** (<sup>1</sup>Tomsk Cancer Research Institute, <sup>2</sup>National Research Tomsk Polytechnic University, Tomsk, Russia)  
**Composite Implants Coated with Biodegradable Polymers does not Stimulate Tumor Progression**
- 11:20 – 11:40 **Coffee break**
- 11:40 – 12:00 **Conference closing session**

## Poster session

March 23, 2016 (Wednesday)

(TPU International Culture Center, 13 Usova Street)

1. **L.V. Antonova<sup>1</sup>, E.O. Krivkina<sup>1</sup>, E.A. Sergeeva<sup>1</sup>, V.V. Sevostyanova<sup>1</sup>, A.Yu. Burago<sup>1</sup>, N.N. Burkov<sup>1,2</sup>, R.F. Sharifulin<sup>2</sup>, E.A. Velikanova<sup>1</sup>, Yu.A. Kudryavtseva<sup>1</sup>, O.L. Barbarash<sup>1</sup>, L.S. Barbarash<sup>1</sup>** (<sup>1</sup>Research Institute for Complex Issues of Cardiovascular Diseases, <sup>2</sup>Kemerovo Cardiology Dispensary, Kemerovo, Russia)  
**Biofunctionalization of nonwoven complex oriented scaffolds with distinct differentiation molecules for the directed tissue regeneration**
2. **O.V. Bakina<sup>1,2</sup>, A.N. Fomenko<sup>1,2</sup>, M.S. Korovin<sup>1,2</sup>, E.A. Glazkova<sup>1,2</sup>, N.V. Svarovskaya<sup>1,2</sup>** (<sup>1</sup>Institute of Strength Physics and Materials Sciences SB RAS, <sup>2</sup>National Research Tomsk Polytechnic University, Tomsk, Russia)  
**Novel of core-shell AlOOH/Cu nanostructures: Synthesis, characterization and in vitro toxicity in Neuro-2a cells**
3. **A.S. Buyakov<sup>1,2</sup>, S.N. Kulkov<sup>1,2</sup>, M. Chatzinikolaidou<sup>3</sup> and D.E. Kulbakin<sup>1,4</sup>** (<sup>1</sup>Institute of Strength Physics and Material Science SB RAS, <sup>2</sup>National Research Tomsk State University, Tomsk, Russia, <sup>3</sup>University of Crete Dept. of Materials Science and Technology, Crete. Greece, <sup>4</sup>Tomsk Cancer Research Institute, Tomsk, Russia)  
**Porous Composite Materials ZrO<sub>2</sub>(Mg)-MgO for Osteoimplantology**
4. **S.P. Buyakova<sup>1,2,3</sup> and S.N. Kulkov<sup>2,3</sup>** (<sup>1</sup>Institute of Strength Physics and Material Science SB RAS, <sup>2</sup>National Research Tomsk State University, <sup>3</sup> National Research Tomsk Polytechnic University, Tomsk, Russia)  
**Material Science Aspects of Cancer Patients Osteoprosthesis**
5. **V.A. Bychkov, L.A. Tashireva, A.V. Isaeva and L.N. Bondar** (Tomsk Cancer Research Institute, Tomsk, Russia)  
**Effect of Neoadjuvant Therapy on Inflammatory Response and Progression of Head and Neck Tumors**
6. **M.V. Grigoriev<sup>1,2</sup>, S.N. Kulkov<sup>1,2,3</sup>** (<sup>1</sup>Institute of Strength Physics and Materials Science SB RAS, <sup>2</sup>Tomsk Polytechnic University, <sup>3</sup>Tomsk State University, Tomsk, Russia)  
**Structures and Properties of Alumina-Based Ceramic for Reconstructive Oncology**
7. **O.Yu. Dvoryaninova<sup>1</sup>, E.G. Nikitina<sup>1,2</sup>, V.A. Bychkov<sup>1</sup>, D.E. Kulbakin<sup>1</sup>, M.R. Muchamedov<sup>1</sup>, N.V. Litviakov<sup>1,2</sup>, E.L. Choinzonov<sup>1,3</sup>** (<sup>1</sup>Tomsk Cancer Research Institute, <sup>2</sup>National Research Tomsk State University, <sup>3</sup>Siberian State Medical University, Tomsk, Russia)  
**Oral and HPV-positive oral cancer in Far Eastern Federal region of Russia and Siberian**
8. **A.N. Fomenko<sup>1,2</sup>, M.S. Korovin<sup>1,2</sup>, O.V. Bakina<sup>1,2</sup>, S.O. Kazantsev<sup>1,2</sup>** (<sup>1</sup>National Research Tomsk Polytechnic University, <sup>2</sup>Institute of Strength Physics and Material Sciences SB RAS, Tomsk, Russia)  
**Comparison study of the cytotoxic effect of low-dimensional structures of aluminum oxide on the L 929 and Neuro-2a cells**
9. **P. Gervas, A. Ivanova, N. Vasiliev, N. Cherdyntseva** (Tomsk Cancer Research Institute, Tomsk, Russia)  
**The Frequency of EGFR Mutations in Non-Small Cell Lung Cancer (NSCLC) Patients from West Siberia**

10. **O. Gileva<sup>1</sup>, T. Libik<sup>1</sup>, K. Danilov<sup>2</sup>** (<sup>1</sup>Perm State Medical University named after Academician E.A.Wagner of Minzdrav of Russia, <sup>2</sup>Perm Regional Oncological Dispensary, Perm, Russia)  
**Oral Precancerous Lesions: Problems of Early Detection and Oral Cancer Prevention**
11. **M.K. Ibragimova<sup>1,2</sup>, M.M. Tsyganov<sup>1,2</sup>, N.V. Cherdyntseva<sup>1,2</sup>, E.M. Slonimskaya<sup>1</sup>, N.V. Litvyakov<sup>1,2</sup>** (<sup>1</sup>Tomsk Cancer Research Institute, <sup>2</sup>National Research Tomsk State University, Tomsk, Russia)  
**Metastatic breast tumor clonal evolution during neoadjuvant chemotherapy**
12. **A.V. Isaeva<sup>1,2</sup>, O.A. Vasil'eva<sup>1</sup>, T.S. Prokhorenko<sup>1</sup>, A.P. Zima<sup>1</sup>** (<sup>1</sup>Siberian State Medical University, <sup>2</sup>Tomsk Cancer Research Institute, Tomsk, Russia)  
**Disorders of the Adhesion Function of  $\beta$ -catenin as a Molecular Platform Malignant Transformation of Thyroid Epithelium**
13. **V.V. Karakulov<sup>1</sup> and I.Yu. Smolin<sup>1,2</sup>** (<sup>1</sup>National Research Tomsk State University, <sup>2</sup>Institute of Strength Physics and Materials Science SB RAS, Tomsk, Russia)  
**Metal-Ceramic Materials. Study and Prediction of Effective Mechanical Properties**
14. **O.A. Kashin<sup>1</sup>, A.I. Lotkov<sup>1</sup>, Yu.A. Kudryavtseva<sup>2</sup>, L.V. Antonova<sup>2</sup>, K.V. Krukovskii<sup>1</sup>, A.N. Kudryashov<sup>3</sup>** (<sup>1</sup>Institute of Strength Physics and Materials Science SB RAS, Tomsk, <sup>2</sup>Research Institute for Complex Issues of Cardiovascular Diseases, Kemerovo, <sup>3</sup>Angioline Interventional Device Ltd, Novosibirsk, Russia)  
**Effect of Plasma Immersion Ion Implantation in NiTi on its Interaction with Human Endothelial Cells**
15. **S.O. Kazantsev<sup>1,2</sup>, O.V. Bakina<sup>1,2</sup>, A.N. Fomenko<sup>1,2</sup>, M.S. Korovin<sup>1,2</sup>, A.S. Lozhkomoev<sup>1,2</sup>** (<sup>1</sup>National Research Tomsk Polytechnic University, <sup>2</sup>Institute of Strength Physics and Material Science SB RAS, Tomsk, Russia)  
**Zeta Potential Change Of Neuro-2a Tumor Cells After Exposure To Metal Oxide Nanoparticle**
16. **I.A. Kirillova<sup>1</sup>, Yu.P. Sharkeev<sup>2,3</sup>, S.V. Nikolaev<sup>4,5</sup>, V.T. Podorozhnaya<sup>1</sup>, P.V. Uvarkin<sup>2</sup>, A.S. Ratushnyak<sup>5</sup>, V.V. Chebodaeva<sup>3</sup>** (<sup>1</sup>Novosibirsk Research Institute of Traumatology and Ortopaedics n.a. Ya. L. Tsivyan, Novosibirsk, <sup>2</sup>Institute of Strength Physics and Materials Science SB RAS, Tomsk, <sup>3</sup>National Research Tomsk Polytechnic University, Tomsk, <sup>4</sup>Institute of Cytology and Genetics SB RAS, Novosibirsk, <sup>5</sup>Design Technological Institute of Digital Techniques SB RAS, Novosibirsk, Russia)  
**Physical and Mechanical Properties of Extracellular Matrix Produced from Demineralized Allogeneic Bone**
17. **T.V. Kolmakova** (Institute of Strength Physics and Materials Science SB RAS, Tomsk, Russia)  
**Computer Study of the Mechanical Behavior of the Jaw Bone Fragments under Uniaxial Compression**
18. **M.V. Korobenzov<sup>1</sup> and S.N. Kulkov<sup>1,2</sup>** (<sup>1</sup>National Research Tomsk State University, <sup>2</sup>Institute of Strength Physics and Material Science SB RAS, Tomsk, Russia)  
**The Simulation Of Fracture Of A Bone Implant With A Porosity Structure**
19. **M.S. Korovin<sup>1,2</sup>, A.N. Fomenko<sup>1,2</sup>** (<sup>1</sup>National Research Tomsk Polytechnic University, <sup>2</sup>Institute of Strength Physics and Material Science SB RAS, Tomsk, Russia)  
**Cytotoxicity Of Low-Dimensional Alumina Structures On Cancer Cells**
20. **D.A. Korshunov** and I.V. Kondakova (Tomsk Cancer Research Institute Tomsk, Russia)  
Effect Of Anti-glycolytic Agents On Tumor Cells In Vitro
21. **R.V. Levkov<sup>1,2</sup>, S.N. Kulkov<sup>1,2</sup>** (<sup>1</sup>Institute of Strength Physics and Material Science SB

RAS, <sup>2</sup>National Research Tomsk State University, Tomsk, Russia)

**Preparation and Properties of Porous Oxide-Hydroxide Ceramic Materials for Osteomalacia**

22. **A.I. Lotkov<sup>1</sup>, O.A. Kashin<sup>1</sup>, Yu.A. Kudryavtseva<sup>2</sup>, D.K. Shishkova<sup>2</sup>, K.V. Krukovskii<sup>1</sup>, A.N. Kudryashov<sup>3</sup>** (<sup>1</sup>Institute of Strength Physics and Materials Science SB RAS, Tomsk, <sup>2</sup>Research Institute for Complex Issues of Cardiovascular Diseases, Kemerovo, <sup>3</sup>Angioline Interventional Device Ltd, Novosibirsk, Russia)  
**Effect of Plasma Immersion Ion Implantation in NiTi on its Interaction with Animal Subcutaneous Tissues**
23. **A.S. Lozhkomoev<sup>1,2</sup> and S.O. Kazantsev<sup>1,2</sup>** (<sup>1</sup>National Research Tomsk Polytechnic University, <sup>2</sup>Institute of Strength Physics and Materials Science SB RAS, Tomsk, Russia)  
**Role of Metal Oxides Nanostructures in Extracellular pH Regulation**
24. **A.I. Malchikhina, E.V. Shesterikov, E.N. Bolbasov, V.P. Ignatov, S.I. Tverdokhlebov** (Tomsk Polytechnic University, Tomsk, Russia)  
**Hybrid Calcium Phosphate Coatings for Implants**
25. **V.G. Matveeva, L.V. Antonova, E.A. Sergeeva, E.O. Krivkina, E.A. Velikanova, Yu.A. Kudryavtseva, O.L. Barbarash, L.S. Barbarash** (Research Institute for Complex Issues of Cardiovascular Diseases, Kemerovo, Russia)  
**Biofunctionalization of nonwoven scaffolds from polycaprolactone with RGD peptides for improving integration with cells**
26. **I.V. Mitrofanova<sup>1,2</sup>, T. Liu<sup>4</sup>, M.A. Buldakov<sup>1,3</sup>, N.V. Cherdyntseva<sup>1,3</sup>, J.G. Kzhyshkowska<sup>1,4</sup>** (<sup>1</sup>Tomsk State University, <sup>2</sup>Siberian State Medical University, <sup>3</sup>Tomsk Cancer Research Institute, Tomsk, Russia, <sup>4</sup>Heidelberg University, Mannheim, Germany)  
**Identification of the Effect of Chitinase-Like Protein YKL39 on the Functional Activity of Tumor-Associated Macrophages**
27. **A. Nikitiuk<sup>1</sup>, A. Kretushev<sup>2</sup>, I. Klemyashov<sup>2</sup>, V. Zakharov<sup>1</sup>, O. Gileva<sup>3</sup>, O. Naimark<sup>1</sup>** (<sup>1</sup>Institute of Continuous Media Mechanics, Perm, <sup>2</sup>Moscow State University of Information Technologies, Radio Engineering and Electronics, Moscow, <sup>3</sup>Perm State Medical University named an academician E.A. Vagner, Perm, Russia)  
**Wavelet based multifractal analysis of coherent phase microscopy data for normal and cancerous cells**
28. **T. Nosenko<sup>1</sup>, L. Plotnokova<sup>1</sup>, M. Uspenskaya<sup>1</sup>, R. Olekhovich<sup>1</sup>, A. Polyanichko<sup>2</sup>, S. Voloshin<sup>3</sup>, A. Garifullin<sup>3</sup>** (<sup>1</sup>Saint Petersburg National Research University of Information Technologies, Mechanics and Optics, <sup>2</sup>Saint-Petersburg State University, <sup>3</sup>Russian Scientific Research Institute of Hematology and Transfusion, Saint-Petersburg, Russia)  
**Study of serum differences between patients with multiply myeloma and healthy donors by FTIR-spectrometry and thermal analysis**
29. **Yu.E. Geints, A.A. Zemlyanov, E.K. Panina** (Zuev Institute of Atmospheric Optics SB RAS, Tomsk, Russia)  
**Photonic Nanojets as a Versatile Optical Tool for Wave Super-Localization**
30. **L. Plotnokova<sup>1</sup>, A. Polyanichko<sup>2</sup>, T. Nosenko<sup>1</sup>, M. Uspenskaya<sup>1</sup>, A. Garifullin<sup>3</sup>, S. Voloshin<sup>3</sup>** (<sup>1</sup>Saint Petersburg National Research University of Information Technologies, <sup>2</sup>Saint-Petersburg State University, <sup>3</sup>Russian Scientific Research Institute of Hematology and Transfusion, Saint-Petersburg, Russia)  
**Characterization of the Infrared Spectra of Serum in Patients With Multiple Myeloma**
31. **A.A. Ponomaryova<sup>1,3</sup>, E.Y. Rykova<sup>2</sup>, N.V. Cherdyntseva<sup>1,4</sup>, A.A. Bondar<sup>2</sup>, A.Y. Dobrodeev<sup>1</sup>, A.A. Zavyalov<sup>1</sup>, S.A. Tuzikov<sup>1</sup>, V.V. Vlassov<sup>2</sup>, P.P. Laktionov<sup>2</sup>**

(<sup>1</sup>Tomsk Cancer Research Institute, Tomsk; <sup>2</sup>Institute of Chemical Biology and Fundamental Medicine SB RAS, Novosibirsk; <sup>3</sup>Tomsk Polytechnic University, Tomsk; <sup>4</sup>Tomsk State University, Tomsk, Russia)

**Liquid biopsy in lung cancer diagnostics and follow-up: circulating epigenetic DNA markers development**

32. **V. Rerikh, A. Avetisyan** (Research Institute of Traumatology and Orthopedics n.a. Ya.L. Tsivyan, Novosibirsk, Russia)  
**Osseointegration Of Alumina Ceramic Granules**
33. **A. Rogotnev<sup>1</sup>, A. Nikitiuk<sup>1</sup>, O. Naimark<sup>1</sup>** (<sup>1</sup>Institute of Continuous Media Mechanics UrB RAS, Perm, Russia)  
**Application of WTMM-method for Analysis of Atomic Force Microscopy Data for Normal and Cancerous Cells**
34. **E.V. Stupak<sup>1</sup>, V.V. Stupak<sup>1</sup>, N.N. Kolesnikov<sup>2</sup>, S.E. Titov<sup>2,3</sup>, M.K. Ivanov<sup>3</sup>, Yu.A. Veryaskina<sup>2</sup>, L.G. Achmerova<sup>2</sup>, and I.F. Zhimulev<sup>2</sup>** (<sup>1</sup>Novosibirsk Research Institute of Traumatology and Ortopaedics, <sup>2</sup>Institute of Molecular and Cell Biology Siberian Branch of RAS, <sup>3</sup>ZAO «Vector-Best», Novosibirsk, Russia)  
**Micro RNA as a Prognostic Marker for Typing Gliomas of Human Brain and Malignancy Degree**
35. **A.A. Tsukanov<sup>1</sup> and S.G. Psakhie<sup>2,3</sup>** (<sup>1</sup>Skolkovo Institute of Science and Technologies, Moscow, <sup>2</sup>National Research Tomsk Polytechnic University, Tomsk, Russia)  
**Charged Protein Residues Adsorption on the Inorganic Nanosheet: Computer Simulation of LDH Interaction with Ion Channel**
36. **M.M. Tsyganov<sup>1,2</sup>, M.K. Ibragimova<sup>1,2</sup>, M.B. Freydin<sup>3</sup>, N.V. Cherdyntseva<sup>1,2</sup>, N.V. Litviakov<sup>1,2</sup>** (<sup>1</sup>Tomsk Cancer Research Institute, <sup>2</sup>Tomsk State University, Tomsk, Russia, <sup>3</sup>King's College London, London, United Kingdom)  
**Panel Of Single Nucleotide Polymorphisms To Predict Changes In Abc-Transporter Expression In Breast Tumor During Chemotherapy**
37. **O.A. Vasil'eva<sup>1</sup>, A.V. Isaeva<sup>1,2</sup>, T.S. Prokhorenko<sup>1</sup>, A.P. Zima<sup>1</sup>, V.V. Novitsky<sup>1</sup>** (<sup>1</sup>Siberian State Medical University, <sup>2</sup>Tomsk Cancer Research Institute, Tomsk, Russia)  
**Galectin-1 and Galectin-3 Induce Mitochondrial Apoptotic Pathway in Jurkat Cells**
38. **A.N. Belkin, G.G. Freund, E.V. Zhivaeva** (Perm State Medical University named by academician E.A. Vagner, Perm, Russia)  
**Electrochemical Method Using Biochips in Colorectal Cancer Diagnostics**

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