SYMPOSIUM

Genomics, transcriptomics, bioinformatics

Oral reports

7 July, Tuesday

Big Conference Hall

Morning session 1. Genomics, transcriptomics, bioinformatics: Computational genomics and oncogenomics

Chair: Yakov Tsepilov, *Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia*

09:00 – 09:30	**PLENARY REPORT** **Understanding heterozygous carrying of deleterious variants as a key for personalized longevity** *Ancha Baranova*, School of Systems Biology, George Mason University, Fairfax, VA
10:25 – 10:45	**Search of New Type of Spatial Organization of Nucleic Acids in Human Genome** Anastasia Zamoskovtseva[1,2], Marsel Kabilov[1], Alexander Lomzov[1], Dmitrii Pyshnyi[1] [1]*ICBFM SB RAS, Novosibirsk, Russia* [2]*NSU, Novosibirsk, Russia*
10:45 – 11:05	**Bioinformatic methods applied to the analysis of the genes retained after the whole genome duplication events in the sterlet genome (*Acipenser ruthenus*)** Mikhail Fofanov[1], Tatyana Sheglova[2], Vladimir Trifonov[2], Manfred Schartl[3] [1]*Novosibirsk State University, Novosibirsk, Russia* [2]*Institute of Molecular and Cellular Biology, SB RAS, Novosibirsk, Russia* [3]*University of Würzburg, Würzburg, Germany*

11:05 – 11:25	**Coffee break**
11:25 – 11:45	**GPU Based Composite Elements Discovery In Large DNA Datasets** Oleg Vishnevsky[1,2], Andrey Bocharnikov[2], Nikolay Kolchanov[1,2] *[1]Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia* *[2]Novosibirsk State University, Novosibirsk, Russia*
11:45 – 12:00	**Using fast homology search tools for protein sequence functional annotation: a comparison** Pronozin Artem, Mikhail Genaev, Dmitry Afonnikov *Institute of Cytology and Genetics SB RAS, Novosibirsk, Russia*
12:00 – 12:20	**Web – 3DPredictor: a Web Interface for High – resolution Prediction of Genome Architecture** Emil Valeev[1], Polina Belokopytova[1], Veniamin Fishman[1,2] *[1]Institute of Cytology and Genetics Novosibirsk, Russia* *[2]NSU, Novosibirsk, Russia*
	Lunch

Evening session 1. Genomics, transcriptomics, bioinformatics: Quantitative genetics and genomic epidemiology

Chairs: Georgii Bazykin, *Skoltech, Moscow, Russia; Institute for Information Transmission Problems (Kharkevich Institute) of the Russian Academy of Sciences, Moscow, Russia;*
Vsevolod Makeev, *Vavilov Institute of General Genetics, Moscow, Russia;*
Ivan Kylakovsky, *Engelhardt Institute of Molecular Biology RAS, Vavilov Institute of General Genetics RAS, Moscow, Russia;*
Yakov Tsepilov, *Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia.*

15:00 – 15:30	**Quantitative genetics and computational functional genomics as tools to study biology** Yurii Aulchenko *Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia* *Novosibirsk State University, Novosibirsk, Russia*
15:30 – 15:50	**Loci and genes involved in chronic musculoskeletal pain identified via analysis of genetically independent pain phenotypes** Yakov Tsepilov Yakov A. Tsepilov[1], Sodbo Z. Sharapov[1], Lennart C. Karssen[2], Yurii S. Aulchenko[3], Maxim B. Freidin[4], Elizaveta E. Elgaeva[1], Pradeep Suri[5], Alexandra S. Shadrina[1], Jan van Zundert[6], Frances M.K. Williams[4] *[1]Novosibirsk State University, Novosibirsk, Russia*

	[2]*PolyOmica, 's – Hertogenbosch, the Netherlands* [3]*Institute of Cytology and Genetics SB RAS, Novosibirsk, Russia* [4]*King's College London, London, UK* [5]*VA Puget Sound Health Care System, Seattle, USA* [6]*Maastricht University Medical Centre, Maastricht, The Netherlands*
15:50 – 16:05	**Labchip GX Touch Nucleic Acid Analyzer for quantitative assays and QC in Genomics** **Ilse Villmann,** Application Scientist, Perkin Elmer, United States *Sponsor report – **BioLine***
16:05 – 16:30	**Quantitative gentetics of protein N – glycosylation** Lucija Klaric[1,2], Yurii S. Aulchenko[3,4,5], Yakov A. Tsepilov[3,5], Gordan Lauc[2,6], Chloe M. Stanton[1], Caroline Hayward[1] [1]*University of Edinburgh, Edinburgh, United Kingdom* [2]*Genos Glycoscience Research Laboratory , Zagreb, Croatia* [3]*Institute of Cytology and Genetics of the SBRAS, Novosibirsk, Russia* [4]*PolyOmica, 's – Hertogenbosch, The Netherlands* [5]*Novosibirsk State University Novosibirsk, Russia* [6] *University of Zagreb, Zagreb, Croatia*
16:30 – 16:45	**Results of genome – wide association study of plasma proteome N – glycosylation in 10,000 sample** Sodbo Sharapov[1], Sofya Feoktistova[1], Lucija Klaric[2], Harry Campbell[2], Matthias Schulze[3], Yurii Aulchenko[1], Yakov A. Tsepilov[4], Eugene Tiys[1], Karsten Suhre[5], Malcolm Dunlop[2], Tim Spector[6], Elizaveta E. Elgaeva[4], Frano Vuckovic[7], Nishi Chaturvedi[8], Frances Williams[6], Gordan Lauc[7] [1]*Institute of Cytology and GeneticsNovosibirsk, Russia* [2]*University of Edinburgh, Edinburgh, United Kingdom* [3]*German Institute of Human Nutrition Potsdam – Rehbruecke. Nuthetal, Germany* [4]*Novosibirsk State UniversityNovosibirsk, Russia* [5]*Weill Cornell Medicine – Qatar, Doha, Qatar* [6]*School of Life Course SciencesKing's College London, London, United Kingdom* [7]*Genos Glycoscience Research Laboratory, Zagreb, Croatia* [8]*MRC Unit for Lifelong Hlth & Ageing University College London, London, United Kingdom*
16:45 – 17:00	**A study of causal relationships between human IgG N – glycosylation traits and twelve associated diseases** Olga O. Zaytseva[1], Gordan Lauc[1], Sodbo Z. Sharapov[2], Yakov A. Tsepilov[3], Lucija Klarić[4] [1]*Genos Glycoscience Research Laboratory, Zagreb, Croatia* [2]*Institute of Cytology and Genetics Novosibirsk, Russia* [3]*Novosibirsk State University Novosibirsk, Russia* [4]*University of Edinburgh, Edinburgh, United Kingdom*
17:00 – 17:10	**Coffee break**

17:10 – 17:40	**Keynote report** **Genomic epidemiology of SARS – CoV – 2 in Russia** A. Komissarov[1], K. Safina[2], A. Fadeev[1], D. Danilenko[1], S. Garushyants[3], V. Shchur[4], G. Bazykin[2,3] *[1]Smorodintsev Research Institute of Influenza* *[2]Skolkovo Institute of Science and Technology (Skoltech)* *[3]A.A. Kharkevitc Institute for Information Transmission Problems of the RAS* *[4]Higher School of Economics National Research University*
17:40 – 17:55	**The role of host genetics in severity of COVID – 19** Ivan Kuznetsov Skolkovo Institute of Science and Technology, Moscow, Russia *Novosibirsk State University, Novosibirsk, Russia*
17:55 – 18:05	**Short break**
18:20 – 18:35	**GWAS – MAP: the platform for analysis of results of genome – wide association studies** Tatiana Shashkova[1], Sodbo Sharapov[1], Denis Gorev[1],Yakov Tsepilov[1], Yurii Aulchenko[1], Eugene Pakhomov[1], Lennart Karssen[2] *[1]Novosibirsk State University, Novosibirsk, Russia* *[2]PolyKnomics's – Hertogenbosch, Netherlands*

8 July, Wednesday

Big Conference Hall

Morning session 2. Genomics and transcriptomics

Chair: Veniamin Fishman, *Institute of Cytology and Genetics Novosibirsk, Russia; NSU, Novosibirsk, Russia*

9.00 – 9.30	**PLENARY REPORT** **Human Genome, Anesthesiology and Critical Care. 20 Years Later** Vladimir Zelman, *Keck School of Medicine - USC*
11:20 – 11:40	**Repetitive elements in the genome of Siberian larch (*Larix sibirica* Ledeb.)** K.A. Miroshnikova[1], M.G. Sadovsky[3], V.S. Akulova[3], V.V. Biriukov[3], , E.I. Bondar[3], V.V. Sharov[3], D.A. Kuzmin[2], Y.A. Putintseva[2], N.V. Oreshkova[3], K.V. Krutovsky[2,4,5] *[1]Institute of Biophysics SB RAS, Krasnoyarsk, Russia* *[2] SibFU, Krasnoyarsk, Russia* *[3] FRC KSC SB RAS, Krasnoyarsk, Russia*

[4]*Georg – August University of Göttingen, Göttingen, Germany*
[5]*Vavilov Institute of General Genetics, Moscow, Russia*

11:40 – 12:00	**Analysis tandem repeats and retrotransposons of *Shepherdia argentea* (Pursh) Nutt** Karina Bone[1,2], Olga Razumova[1,3], Gennady Karlov[1], Ilya Kirov[1] [1]*All – Russia Research Institute of Agricultural Biotechnology, Moscow, Russia* [2]*Russian State Agrarian University – Moscow Timiryazev Agricultural Academy, Moscow, Russia* [3]*Kurchatov Genomic Center, Moscow, Russia*
12:00 – 12:20	**Break**
12:20 – 12:35	**Analysis of the Complete Genome Sequence of Strain Concept – 8, the New Representative of the Genus *Methylococcus*** I.Y. Oshkin[1,2], K.K. Miroshnikov[1,2], D.V. Chernushkin[3], N.V. Ravin[2,4], V.O. Popov[2], V.N. Khmelenina[5,6], S.E. Belova[1,2], A.V. Beletsky[4,2], S.N. Dedysh[1,2], S. Y. But[5,6], N.S. Khokhlachev[7], A.V. Mardanov[2,4], N.V. Pimenov[1,2] [1]*Winogradsky Institute of Microbiology, Moscow, Russia* [2]*Research Center of Biotechnology of the Russian Academy of Sciences, Moscow, Russia* [3]*BIOSINTEZ, LLC* [4]*Institute of Bioengineering, Moscow, Russia* [5]*Federal Research Center "Pushchino Scientific Center for Biological Research of the Russian Academy of Sciences",* [6]*G.K. Skryabin Institute of Biochemistry and Physiology of Microorganisms, Russian Academy of Sciences* [7]*Gazprom VNIIGAZ*
12:35 – 12:50	**Effective sample preparation for NGS – increasing productivity, reducing costs** Baybaev Nikolay, *Dia – M, Moscow, Russia* *Sponsor report – **Dia – M***
	Lunch

Evening session 2. Genomics, transcriptomics, bioinformatics: Gene regulation

Chairs: Yurii Aulchenko, *Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia; Novosibirsk State University, Novosibirsk, Russia*
Georgii Bazykin, *Skoltech, Moscow, Russia; Institute for Information Transmission Problems (Kharkevich Institute) of the Russian Academy of Sciences, Moscow, Russia*
Ivan Kylakovsky, *Engelhardt Institute of Molecular Biology RAS, Vavilov Institute of General Genetics RAS, Moscow, Russia*

14.30 – 15.00	**PLENARY REPORT** **Understanding the evolution of complex regions in bird genomes**

	Alexander Sang-Jae Suh, *Department of Evolutionary Biology, Uppsala University, Uppsala, Sweden*
15:00 – 15:30	**Keynote report** **Exploring the universe of transcription factor binding motifs in DNA** Vsevolod Makeev *Vavilov Institute of General Genetics, Moscow, Russia*
15:30 – 15:50	**Analysis of motifs co – occurrence in ChIP – seq data** Victor Levitsky, Elena Zemlyanskaya, Dmitry Oshchepkov, Anton Tsukanov and Tatyana Merkulova *Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia*
15:50 – 16:00	**Short break**
16:00 – 16:30	**AD ASTRA: the database of Allelic Dosage – corrected Allele – Specific TRAnscription factor binding suggests causal regulatory sequence variants of pathologies** Sergey Abramov[1], Eugene Baulin[2], Vsevolod J Makeev[1], Alexandr Boytsov[1], Ivan Yevshin[3], Ivan Kulakovsky[4], Bykova Dariia[5], Fedor Kolpakov[6] *[1]Vavilov Institute of General Genetics RAS, Moscow, Russia* *[2]Institute of Mathematical Problems of Biology RAS – the Branch of Keldysh Institute of Applied Mathematics of Russian Academy of Sciences, Pushchino, Russia* *[3]BIOSOFT.RU LLC, Novosibirsk, Russia* *[4]Engelhardt Institute of Molecular Biology RAS, Moscow, Russia* *[5]Lomonosov Moscow State University, Moscow, Russia* *[6] Institute of Computational Technologies SB RAS, Novosibirsk, Russia*
16:30 – 16:50	**Diversity of Cis – elements in Response to Dioxin in Human** Evgenia Oshchepkova[1], Yana Sizentsova[1], Victoria Mironova[1,2] *[1]Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia* *[2]NSU, Novosibirsk, Russia*
16:50 – 17:10	**Coffee break**
17:10 – 17:40	**GTRD – an integrated view on transcription regulation** Fedor A. Kolpakov[1,2], Ivan S. Evshin[1,2], Semyon K. Kolmykov[1,3], Yury V. Kondrakhin[1], Mikhail A. Kulyashov[1,4], Ruslan N.Sharipov[1,2,4] *[1]Institute of Computational Technologies, SB RAS, Novosibirsk, Russia* *[2]BIOSOFT.RU, LLC, Novosibirsk, Russia* *[3]FRC Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia* *[4]Novosibirsk State University, Novosibirsk, Russia*

17:40 – 17:55	**Meta – analysis of ChIP – seq Datasets Through Rank Aggregation Approach** Semyon K. Kolmykov[1,2], Ivan S. Yevshi[2,3], Yury V. Kondrakhin[2], Anna S. Ryabova[2,3], Ruslan N. Sharipov[3], Fedor A. Kolpakov[2,3] *[1]Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia* *[2]Institute of Computational Technologies SB RAS, Novosibirsk, Russia* *[3]BIOSOFT.RU, LLC, Novosibirsk, Russia*
17:55 – 18:10	**News in microdissection in the context of transcriptomic studies and single cell research: AccuLift Fluidigm** Anna Tarasevich, *Helicon Company, Moscow, Russian Federation* *Sponsor report – **Helicon Company***
18:10 – 18:25	**JetGene – an Internet Resource for Analysis of Regulatory Regions or Nucleotide Contexts at Differently Translated Transcripts** N.S. Sadovskaya[1], O.N. Mustafaev[2], I.V. Goldenkova – Pavlova[1], A.A. Tyurin[1] *[1]Tmiryazev Institute of Plant Physiology, RAS, Moscow, Russia* *[2]Genetic Resources Institute, ANAS, Baku, Azerbaijan*
18:25 – 18:40	**New Approach to Genome – Wide Automated Inference of Bacterial Transcription Factor Binding Sites** Yevgeny Nikolaichik, Pavel Vychik *Belarusian State University, Minsk, Belarus*
18:40 – 18:55	**Random Projections for functional signal extraction from single – cell RNA – seq data** Alexey Samosyuk *Skolkovo Institute of Science and Technology, Moscow, Russia*

Poster session

Statistical problems of clusters of transcription factor binding sites in plant genomes
Artur Dergilev[1,2], Yuriy L. Orlov[1,3]
[1]Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia
[2]Novosibirsk State University, Novosibirsk, Russia
[3]I.M.Sechenov First Moscow State Medical University, Moscow, Russia

Loci and genes involved in chronic musculoskeletal pain identified via analysis of genetically independent pain phenotypes
Yakov Tsepilov[1], Maxim B. Freidin[4], Alexandra S. Shadrina[1], Sodbo Z. Sharapov[1], Elizaveta E. Elgaeva[1], Jan van Zundert[6], Lennart C. Karssen[2], Pradeep Suri[5], Frances M.K. Williams[4], Yurii S. Aulchenko[3]
[1]Novosibirsk State University, Novosibirsk, Russia
[2]PolyOmica, 's – Hertogenbosch, the Netherlands
[3]Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia
[4]King's College London, London, UK

[5]*VA Puget Sound Health Care System, Seattle, USA*
[6]*Maastricht University Medical Centre, Maastricht, The Netherlands*

Genome – Centered Integrated Instrumental Information System Modeling and Interpretation of Human and Virus Omics
Anatoliy Shlikht, Natalia Kramorenko
Far Eastern Federal University, Vladivostok, Russia

The elements of CRISPR – Cas – like system in genome of Arabidopsis thaliana: possible origin and some evidence on their functionality
Ivan Petrushin[1], Yuri Konstantinov[2], Igor Gorbenko[2]
[1]*ISU, Irkutsk, Russia*
[2]*SIPPB SB RAS, Irkutsk, Russia*

Computational Pipeline for Genomic Epidemiology Surveillance of Pathogenic Bacteria
Andrey Shelenkov, Yulia Mikhaylova, Yurii Yanushevich, Vasiliy Akimkin
Central Research Institute of Epidemiology, Moscow, Russia

Genetic mapping of QTLs controlling the ISIAH hypertensive rat behavior in an open field tests
Olga Redina, Svetlana Smolenskaya, Arcady Markel
Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia

Transcriptional profiling of ventral tegmental area of male mice with alternative patterns of social behaviors
Olga Redina, Vladimir Babenko, Vadim Efimov, Dmitry Smagin, Irina Kovalenko, Anna Galyamina, Natalia Kudryavtseva
Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia

A study of genes controlling carcinogenesis in a regenerative model flatworm *Macrostomum lignano*
Kitill Ustyantsev[1], Mikhail Biryukov[1], Eugene Berezikov[1,2]
[1]*Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia*
[2]*European Research Institute for the Biology of Ageing, Groningen, The Netherlands*

Novel loci associated with plasma immunoglobulin G N – glycosylation identified by a multivariate analysis
Alexandra S. Shadrina[1], Alexander S. Zlobin[1], Olga O. Zaytseva[2], Gordan Lauc[2], Lucija Klaric[3], Sodbo Z. Sharapov[1], Yurii S. Aulchenko[1], Yakov A. Tsepilov[1]
[1]*Institute of Cytology and Genetics, Novosibirsk, Russia*
[2]*Genos Glycoscience Research Laboratory, Zagreb, Croatia*
[3]*University of Edinburgh, Edinburgh, United Kingdom*

Peak caller comparison through quality control of ChIP – Seq datasets

Ruslan N. Sharipov[1,2], Yury V. Kondrakhin[1,3], Semyon K. Kolmykov[1,3], Ivan S. Yevshin[1,3], Anna S. Ryabova[1,3], Fedor A. Kolpakov[1,3]
[1]BIOSOFT.RU, LLC; Novosibirsk, Russia
[2]Novosibirsk State University, Novosibirsk, Russia
[3]Institute of Computational Technologies SB RAS, Novosibirsk, Russia

The first insights into regulation of cell transdifferentiation during gut regeneration in Eupentacta fraudatrix
Alexey Boyko, Igor Dolmatov
NSCMB FEB RAS, Vladivostok, Russia

Disruptive natural selection by male reproductive potential prevents underexpression of the genes encoding proteins on the human Y chromosome as a self – domestication syndrome
Mikhail Ponomarenko, Irina Chadaeva, Dmitry Oshchepkov, Dmitry Rasskazov, Alexander Osadchuk, Ludmila Osadchuk
Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia

The limits of the additive model for adult height
Ivan A. Kuznetsov[1,2], Sergei A. Slavskii[2], Tatiana I. Shashkova[2], Georgii A. Bazykin[1], Tatiana I. Axenovich[3], Fyodor A. Kondrashov, Yurii S. Aulchenko
[1]Skolkovo Institute of Science and Technology, Moscow, Russia
[2]Novosibirsk State University, Novosibirsk, Russia
[3]Institute of Cytology and Genetics SB RASm Novosibirsk, Russia
[4]Institute of Science and Technology, Vienna, Austria

Functional Roles of the E3 Ubiquitin Ligase HYD in Drosophila Tissues
Iuliia Aleksandrovna Galimova[1], Natalia Vladimirovna Dorogova[2], Svetlana Aleksandrovna Fedorova[2], Elena Ustinovna Bolobolova[2]
[1] Institute of Molecular and Cellular Biology, SB RAS, Novosibirsk, Russia
[2]Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia

Competition and collaboration in the miRNA science field
Artemiy Firsov[1], Igor Titov[2]
[1]Computer Science and Computer Engineering, Institute of Informarics Systems, Novosibirsk, Russia
[2]The Federal Research Center Institute of Cytology and Genetics, Novosibirsk, Russia

High performance pipeline for the calculation of Polygenic Risk Scores
Arina Nostaeva[1], Tatiana Shashkova[1], Sodbo Sharapov[1], Yakov Tsepilov[1], Yurii Aulchenko[1,2], Lennart C. Karssen[2]
[1]Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia
[2]PolyKnomics's – Hertogenbosch, The Netherlands

Computer methods for visualization chromosome – specific DNA sequences in FISH images
Bogomolov A.G.[1,2], Karamysheva T.V.[1], Rubtsov N.B.[1,2]
[1]*Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia*
[2]*Novosibirsk State University, Novosibirsk, Russia*

Genome – wide association study of Parkinson's disease using MAX3 test
Georgii Ozhegov[1,2], Dmitry Poveri[3], Sergey Medvedev[4], Suren Zakian[4], Yuri Vyatkin[2,5], Sergey Postovalov[2,5]
[1]*Kazan Federal University, Kazan, Russia*
[2]*Novel Software Systems, Ltd., Novosibirsk, Russia*
[3]*Novosibirsk State Technical University, Novosibirsk, Russia*
[4]*Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia*
[5]*Novosibirsk State University, Novosibirsk, Russia*

A new method for combining of genetically correlated traits by maximizing of their shared heritability
Gulnara R. Svishcheva[1], Evgeny S. Tiys[1], Sofya G. Feoktistova[1], Elizaveta E. Elgaeva[1], Sodbo Sharapov[1], Yakov A. Tsepilov[2]
[1]*Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia*
[2]*Novosibirsk State University, Novosibirsk, Russia*

Statistical relations between N – glycome of circulating immunoglobuline G and total plasma N – Glycome
Sofya G. Feoktistova[1], Tim Spector[2], Yurii S. Aulchenko[3], Sodbo Sharapov[3], Gordan Lauc[4] Yakov A. Tsepilov[5], Frano Vuckovic[6]
[1]*Institute of Cytology and Genetic, Novosibirsk, Russia*
[2]*Department of Twin Research and Genetic Epidemiology, School of Life Course Sciences King's College London, London, United Kingdom*
[3]*Institute of Cytology and Genetics, Novosibirsk, Russia*
[4]*Genos Glycoscience Research Laboratory, Zagreb, Croatia*
[5]*Novosibirsk State University, Novosibirsk, Russia*
[6]*Genos Glycoscience Research Laboratory, Zagreb, Croatia*

lncRNAs – their potential in regulation of hypertension and behavior of ISIAH rats
Ivan Sidorenko, Vladimir Babenko, Arcady Markel, Olga Redina
Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia

Transcription factor Kaiso regulates cell division in the developing mouse brain
Nina Illarionova[1], Maria Borisova[1], Ekaterina Bazhenova[1], Daria Fursenko[2], Daria Zabelina[3], Nikita Khotskin[1],| Alexander Kulikov[1]
[1]*ICG SB RAS, Novosibirsk, Russia*
[2]*Institute of Gene Biology RAS, Moscow, Russia*
[3]*NSU, Novosibirsk, Russia*

Patterns of maternal and paternal inheritance in Russian populations
Anton Logachev, Daisuke Hirata, Gaik Tamazian
St. Petersburg State University, St. Petersburg, Russia

Molecular basis of phosphoryl guanidine oligonucleotides elongation by Taq DNA polymerase
Alexander Lomzov, Dmitrii Pyshnyi
ICBFM SB RAS, Novosibirsk, Russia

Software pipeline for the analysis of the functional role of nucleotide substitutions in regulatory regions of genes and its testing on polymorphisms associated with obesity
Ekaterina Alekseevna Matrosova[1], Vadim Mikhailovich Efimov[1,2], Elena Vasilevna Ignatieva[2]
[1]*Novosibirsk State University, Novosibirsk, Russia*
[2] *Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia*

WebMCOT web – service for prediction of co – occurred DNA motifs in ChIP – seq data
Aleksey Mukhin, Victor Levitsky, Dmitriy Y. Oschepkov, Sergey A. Lashin
Institute Cytology and Genetics, SB RAS, Novosibirsk, Russia

Identification and description of the genes with a high mutation frequency in vagal paragangliomas
Vladislav Pavlov[1], Anastasiya Snezhkina[1], George Krasnov[1], Dmitry Kalinin[2], Alexander Golovyuk[2], Anna Kudryavtseva[1]
[1]*EIMB RAS, Moscow, Russia*
[2]*A.V. Vishnevsky National Medical Research Center of Surgery, Moscow, Russia*

Differentially expressed microRNAs in carotid paraganglioma
Anastasiya Snezhkina, Elena Pudova, Vladislav Pavlov, Maria Fedorova, George Krasnov, Anna Kudryavtseva
EIMB RAS, Moscow, Russia

Results of the whole – genomic sequencing and annotation of the Listeria phenotype
Marina Terekhova[1], Elizaveta Rogacheva[2], Lyudmila Kraeva[2], Irina Derevyanchenko[3]
[1]*St. Petersburg State University of Information Technologies, Mechanics and Optics, Saint – Petersburg, Russia*
[2]*Saint – Petersburg Pasteur Institute, Saint – Petersburg, Russia*
[3]*Branch of the Federal State Health Institution "Center for Hygiene and Epidemiology in the City of St. Petersburg", Saint – Petersburg, Russia*

LTR – retrotransposon transcripts are ubiqutiously expressed, polyadenylated and underwent splicing in sunflower (*Helianthus annuus* L.)
Pavel Merkulov, Murad Omarov, Ilya Kirov
All – Russian Research Institute of Agricultural Biotechnology RAS, Moscow, Russia

Constructing a pipeline for genome variant / gene functioning hybrid prioritization: a case study of type II diabetes
Irina Kolesnikova[1], Valery Polunovsky[1], Konstantin Gunbin[2,3]
[1]*LLC NCGI, Novosibirsk, Russia*
[2]*Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia*
[3]*NSU, Novosibirsk, Russia*

Differentially expressed genes associated with TMPRSS2 – ERG molecular subtype of prostate cancer
Anastasiya Andreevna Kobelyatskaya[1], Elena Anatolevna Pudova[1], George Sergeevich Krasnov[1], Anna Victorovna Kudryavtseva[1], Kirill Mikhailovich Nyushko[2], Boris Yakovlevich Alekseev[2]
[1]*EIMB RAS, Moscow, Russia*
[2]*FSBI NMRRC, Moscow, Russia*

RTrans: a pipeline for multi – way analysis of differential gene expression profiles
George Sergeevich Krasnov, Anastasiya Andreevna Kobelyatskaya, Anastasiya Vladimirovna Snezhkina, Vladislav Sergeevich Pavlov, Elena Anatolevna Pudova, Anna Victorovna Kudryavtseva
EIMB RAS, Moscow, Russia

Intermediate and high – risk prostate cancer methylation analysis
Anastasiya Andreevna Kobelyatskaya[1], Kirill Mikhailovich Nyushko[2], Elena Anatolevna Pudova[1], Boris Yakovlevich Alekseev[2], George Sergeevich Krasnov[1], Anna Victorovna Kudryavtseva[1]
[1]*EIMB RAS, Moscow, Russia*
[2]*FSBI NMRRC, Moscow, Russia*

Allelic drop – out is a common phenomenon reducing the diagnostic yield of PCR – based target sequencing
Anna Shestak[1], Anna Bukaeva[1], Siamak Saber[2], Elena Zaklyazminskaya[1]
[1] *Petrovsky National Research Center of Surgery, Moscow, Russia*
[2] *Cardiac Electrophysiology Research Center, Rajaie Cardiovascular Medical and Research Center, Iran University of Medical Sciences, Tehran, Iran*

AD ASTRA: the database of Allelic Dosage – corrected Allele – Specific TRAnscription factor binding suggests causal regulatory sequence variants of pathologies
Sergey Abramov[1] , Alexandr Boytsov[1] , Bykova Dariia[2], Eugene Baulin[3], Ivan Yevshin[4], Fedor Kolpakov[6], Vsevolod J Makeev[1] , Ivan V Kulakovskiy[5]
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[6]*Institute of Computational Technologies SB RAS, Novosibirsk, Russia*

Analysis of short – and long – range interactions within potential binding sites notably extends the fraction of verified peaks in ChIP – seq data
Anton Tsukanov, Victor Levitsky, Tatyana Merkulova
Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia

X-chromosome Inactivation in American Mink iPSCs
Inna Pristyazhnyuk Aleksei Menzorov
Institute of Cytology and Genetics SB RAS, Novosibirsk, Russia

Cryptic Plasmids of Alfalfa Root Nodule Bacteria – Structural and Functional Diversity
Alla Saksaganskaia, Viktoria Muntyan, Alexey Afonin, Marina Roumiantseva
ARRIAM, Saint – Petersburg, Pushkin, Russia

Whole genome sequencing and assembly of *Saccharomyces cerevisiae* genomes using Oxford Nanopore data
Andrew G. Matveenko[1], Anton B. Matiiv[1], Yury A. Barbitoff[1,4], Evgenia M. Maksiutenko[1,2], Svetlana E. Moskalenko[1,2], Alexandra V. Beliavskaia[3], Alexander V. Predeus[3,4], Galina A. Zhouravleva[1]
[1]*St. Petersburg State University, St. Petersburg, Russia*
[2]*Vavilov Institute of General Genetics, St. Petersburg Branch, St. Petersburg, Russia*
[3]*University of Liverpool, Liverpool, UK*
[4]*Bioinformatics Institute, St. Petersburg, Russia*

The Rich Inner World of Colorado Potato Beetles – a Metagenomic Survey of Viral Diversity in Public Data
Maria Starchevskaya[1], Yuri Vyatkin[2,3], Denis Antonets[1,3]
[1]*SRC VB "Vector" Rospotrebnadzor, Koltsovo, Russia*
[2]*Novosibirsk State University, Novosibirsk, Russia*
[3]*Novel Software Systems LLC, Novosibirsk, Russia*

Potential of Whole Genome Sequencing in the Assessment of Sensitivity of Clinical Isolate *M. tuberculosis* to Antibiotics
Olga Berdyugina
IIP RAS, Ekaterinburg, Russia

Genome distance between regulatory elements of growth – related genes may determine morpho – physiological traits in mammals
Dmitriy Romanov, Tatiana Shkurat
Southern federal university, Rostov – on – Don, Russia

Promoter expression landscape in skeletal muscle in hindlimb suspension and recovery model in rat

Guzel Gazizova[1], Ruslan Deviatiiarov[1], Islam Nigmetzyanov1, Ilia Akberdin[2,3], Sergei Pintus[2,4], Oksana Tyapkina[5], Fedor Kolpakov[4], Leniz Nurullin[5], Oleg Gusev[5,6]

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[5]FRC KSC RAS, Kazan, Russia
[6]RIKEN, Yokohama, Japan

Differentially methylation of ANKRD53 and GATA3 genes in human miscarriages with trisomy 16

E. N. Tolmacheva | S.A.Vasilyev | O.Yu. Vasilyeva | T.V. Nikitina | E.A.Sazhenova | A.V.Markov | E.S. Serdyukova | D.I. Zhigalina | I.N.Lebedev

Advanced data curation in GTRD database: hierarchical dictionaries of cell types and experimental factors

Mikhail A. Kulyashov[1,2,3,4], Semyon K. Kolmykov[1,3,4], Ivan S. Yevshin[1,4], Fedor A. Kolpakov[1,4]

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Functional annotation of the transcription factors from Methylotuvimicrobium alcaliphilum 20ZR

Semyon K. Kolmykov[1,2,3], Nikita V. Ivanisenko[3], Ivan S. Evshin[1,2], Mikhail Kulyashov[1,2,4], Tamara M. Khlebodarova[3], Ilya R. Akberdin[1,3,4]

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Transcriptome (RNA – seq) analysis of human salivary gland cells with exogenous expression of human pancreas beta cells transcription factors PDX1, MAFA, NGN3

Olga Brovkina[1], Alexander Artyuho[2], Yulia Kolesova[3], Erdem Dashinimaev[2,4], Mikhail Borisov[4], Ekaterina Vorotelyak[4], Andrey Vasiliev[4]

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[3]Sechenov First Moscow State Medical University, Institute of Molecular Medicine, Moscow, Russia
[4]Koltzov Institute of Developmental Biology, Russian Academy of Sciences, Moscow, Russia

Metavirome analysis of Baikal sponges
Tatyana Vladimirovna Butina, Yurij Sergeevich Bukin, Igor Veniaminovich Khanaev
LIN SB RAS, Irkutsk, Russia

Detection of alphacoronavirus in bat fecal samples from Volgograd region
Elena Korneenko[1], A.E. Samoilov[1], I.V.Artyushin[2], A.V. Dudorova[2], E.V. Pimkina[1], V.G. Dedkov[3], M.V. Safonova[4], A.D. Matsvay[5], A.S. Speranskaya[1,2]
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[2]Lomonosov Moscow State University, Moscow, Russia
[3]Pasteur Institute, Saint – Petersburg, Saint – Petersburg, Russia
[4]Plague Control Center, Federal Service on Consumers' Rights Protection and Human Well – Being Surveillance, Moscow, Russia
[5]FSBI "Center of Strategic Planning" of the Ministry of Health, Moscow, Russia

Genome – wide Association Study Reveals Novel Genetic Variants Associated with HIV – 1C Infection in Botswana Population
Andrey Shevchenko, Sergey V. Malov, Alexey Antonik
Theodosius Dobzhansky Center for Genome Bioinformatics, St – Petersburg, Russia
St. – Petersburg State University, St – Petersburg, Russia

Automatic Annotation of Operons Responsible for O – antigen Synthesis
Danil Zilov, Polina Chesnokova, Alexey Komissarov
ITMO University, St. Petersburg, Russia

Short sequence repeats (SSR) under selection pressure: Cyprinidae fish case study
Mikhail Orlov[1], Andrey Tykhonov[2]
[1]ICB RAS, Pushchino, Russia
[2]"Aqua Logo" company group, Moscow, Russia

Evaluation of biological activity of the conjugates of granulocyte – macrophage colony stimulating factor with alendronic acid
Ekaterina A. Volosnikova, Tat'yana I. Esina, Alena V. Bateneva, Galina G. Shimina, Elena D. Danilenko
IMBT FBRI SRC VB «Vector», Rospotrebnadzor, Berdsk, RUSSIA

Functional study of potential regulatory SNPs (rs590352, rs11542583, rs3829202, rs78317230, rs2072580, rs4796672)
Arina Degtyareva[1], Elena Leberfarb[1], Ilya Brusentsov[1], Tatiana Kuzina[2], Tatiana Merkulova[1]
[1]ICG SB RAS; [2]NSU, Novosibirsk, RUSSIA

PCR dependent biases could significantly affect quantitative estimation of plant mix composition
Valeriia Kaptelova[1], Maria Logacheva[4,5], Anna Speranskaya[1], Denis Omelchenko[2], Anna Fedotova[4,5], Anastasia Krinitsina[5,6], Andrey Ayginin[3], Kamil Khafizov[3], Elena Korneenko[1], Andrei Samoilov[1]

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[6]*I.M. Sechenov First Moscow State Medical University, Pharmaceutical Natural Science Department, Moscow, Russia*

Bioinformatic Screening for Subtilisin – like Peptidases in Dikaryotic Fungi
Nikita Alkin[1], Yakov Dunaevsky[2], Mikhail Belozersky[2], Galina Beliakova[1], Valeriia Tereshchenkova[1], Elena Elpidina[2]
[1]*MSU, Moscow, Russia*
[2]*MSU Belozersky IPCB, Moscow, Russia*

EPhIMM: computational workflow for fast phylogenetic inference based on multiple alignment of prokaryotic single – copy marker genes
Aleksei Korzhenkov
NRC Kurchatov Institute, Moscow, Russia

Functioning of unique nitrile – detoxifying system in soil xenobiotic degrader *Rhodococcus rhodochrous*: a whole – genome transcriptomic approach
Konstantin V Lavrov[1], Andrey D Novikov[1], Tatyana I Kalinina[1], Artem S Kasianov[2], Alexander S Yanenko[1]
[1]*NRC "Kurchatov institute –GosNIIgenetika, Moscow, Russia*
[2]*Vavilov Institute of General Genetics, Moscow, Russia*

Comparative analysis of repeatome composition of four allopolyploid Poaceae species
Elizaveta Kolganova, Michail Divashuk, Ilya Kirov
All – Russia Research Institute of Agriculture Biotechnology, Moscow, Russia

Comparison of Brain Transcriptome Profiles of Short – lived and Long – lived Species of Nothobranchius
Zulfiia Guvatova[1], George Krasnov[1], Sergey Simanovsky[2], Alexander Frolov[2], Nataliya Gladysh[3], Anna Kudryavtseva[2]
[1]*Engelhardt Institute of Molecular Biology, Russian Academy of Sciences, Moscow, Russia*
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[3]*MSAVM&B – MVA named after K.I. Skryabin, Moscow, Russia*

Genome Assembly and Annotation of *Nothobranchius rachovii* killifish
Zulfiia Guvatova[1], George Krasnov[1], Anastasiya Snezhkina[1], Artemy Tokarev[2], Maria Fedorova[1], Anna Kudryavtseva[1]
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Comparative genomics and quantitative proteomics reveal differentially produced proteins underlying virulence and host specificity in *Bacillus thuringiensis*

Yury Malovichko[1], Maria Belousova[1], Elena Lukasheva[2], Daria Gorbach[2], Ekaterina Romanovskaya[2], Christian Ihling[3], Andrej Frolov[2,3], Anton Nizhnikov[1,2], Kirill Antonets[1,2]

[1]All – Russian Research Institute of Agricultural Microbiology, Saint Petersburg, Russia

[2]St. Petersburg State University, Saint Peterburg, Russia

[3]Institute of Pharmacy, Martin – Luther Universität Halle – Wittenberg, Halle, Germany

Expression of DNA reparation genes in anhydrobiotic insect *Polypedilum vanderplanki*

Alexander Nesmelov, Sabina Kondratyeva, Taisiya Voronina

IFMB KFU, Kazan, Russia

Predicting elongation efficiency of gene translation for annotation of bacterial genomes: a case study for biosynthetic gene clusters of nonribosomal peptides

A.I. Klimenko[1], Yu.G. Matushkin[1], D.A. Afonnikov[1,2]

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[2]Novosibirsk State University, Novosibirsk, Russia

MicroRNA content of horse and human milk exosomes

Sergey Sedykh, Kuleshova Anna, Georgy Nevinsky

ICBFM SB RAS, Novosibirsk, Russia

Mutational profile of Diffuse Large B – cell Lymphoma with central nervous system relapse: analysis of CBioPortal for Cancer Genomics database

Elena Voropaeva[1], Olga Beresina[3], Viktoria Karpova[4], Yuriy Orlov[2], Maria Churkina[3], Tatyana Pospelova[3], Vladimir Maximov[1], Anastasia Ivanova[1], Elizaveta Melnikova[1], Anna Gurageva[1]

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[3]NSMU, Novosibirsk, Russia

[4]State Regional Clinical Hospital, Novosibirsk, Russia

Justification of measures for optimization and prevention with dysplasia of stratified squamous epithelium of the cervix in women of reproductive age

Ra'nokhon Solieva Bakhodir qizi[1], Dilfuza Alieva Abdullaevna[2]

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[2]Republican specialized scientific and practical medical center of obstetrics and gynecology. Tashkent, Uzbekistan

Hemolymph metagenome of endemic amphipod Eulimnogammarus verrucosus from Lake Baikal
Ekaterina Shchapova[1], Anton Gurkov[1], Natalia Belkova[2], Renat Adelshin[3,1], Maxim Timofeyev[1]
[1]*Irkutsk State University, Irkutsk, Russia*
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[3]*Irkutsk Anti – Plague Research Institute of Siberia and Far East, Irkutsk, Russia*

Genes expression related to the effects of hypoxia in the marine mussel, *Mytilus galloprovincialis*
Ekaterina Vodiasova[1], Aleksandra Andreyeva[1], Anastasiya Lantushenko[2], Yakov Meger[2], Irina Deghtyar[2], Dmitry Afonnikov[3,2]
[1]*IBSS RAS, Sevastopol, Russia*
[2]*SSU, Sevastopol, Russia*
[3] Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia

SYMPOSIUM
Systems computational biology: analysis, mathematical modeling and information technologies

Oral reports

7 July, Tuesday

Small Conference Hall

Morning session. Systems computational biology: analysis, mathematical modeling and information technologies

Chair: *Mikhail Marchenko, Institute of Computational Mathematics and Mathematical Geophysics, SB RAS, Novosibirsk, Russia*
Denis Ponomarev, A.P. Ershov Institute of Informatics Systems SB RAS, Novosibirsk, Russia

09:00 – 09:30	**PLENARY REPORT** **Understanding heterozygous carrying of deleterious variants as a key for personalized longevity** *Ancha Baranova*, School of Systems Biology, George Mason University, Fairfax, VA
9:30 – 10:00	**Keynote report** **ANDSystem: text mining – based associative gene networks discovery system and its application to biomedical tasks** Vladimir Ivanisenko[1,2], Olga Saik[1], Timofey Ivanisenko[1,2], Nikita Ivanisenko[1], Evgeny Tiys[1], Pavel Demenkov[1], Nikolay Kolchanov[1] [1]*Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia* [2]*Novosibirsk State University, Novosibirsk, Russia*
10:00 – 10:20	**ANDDigest: A Text – Mining Based Computer System For Generating Digests in the Field of Biology** Timofey Ivanisenko[1,2], Pavel Demenkov[1], Vladimir Ivanisenko[1,2], Nikolay Kolchanov[1] [1]*Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia* [2]*Novosibirsk State University, Novosibirsk, Russia*
10:20 – 10:40	**A feedback loop enrchment analysis in gene network of Bronchial asthma and pulmonary tuberculosis interaction** Evgeny S. Tiys, Pavel S. Demenkov, Vladimir A. Ivanisenko, Nikolay A. Kolchanov *Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia*
10:40 – 11:00	**Integrated informational – computer system for modeling and analysis of DNA functional sites activity** Mikhail Ponomarenko *Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia*
11:00 – 11:20	**Coffee – break**
11:20 – 11:40	**The novel primary targets of CDDO – Im, defining its cytoprotective activity: *in silico* identification** Andrey Markov *Institute of Chemical Biology and Fundamental Medicine, SB RAS, Novosibirsk, Russia*
11:40 – 12:00	**Analysis of noise in gene ensembles based on transcriptional responses of the human body to coronavirus infection: a search for predictors of infection severity, level of immune response, and new pharmacological targets** *Yu. M. Moschkin* *Erasmus MC, Rotterdam, Netherlands*
12:00 – 12:20	**Mathematical Modeling of Allergenic Pollen Propagation in Atmospheric Layer** *Olga Sergeevna Medveditsyna [1], Sergey Leonidovich Rychkov[2], Anatoly Victorovich Shatrov[2]* [1]*Kirov State Medical University, Kirov City, Russia* [2]*Vyatka State University, Kirov City, Russia*

12:20 – 12:40	**On region based inference in genome wide association study** Sergey V. Malov, Alexey Antonik, Andrey Shevchenko ***Theodosius Dobzhansky Center for Genome Bioinformatics, St – Petersburg, Russia*** ***St. – Petersburg State University, St – Petersburg, Russia***
	Lunch

Evening session 1. Mathematical issues of systems biology

Chairs: Vladimir Golubyatnikov, *Sobolev Institute of Mathematics, SB RAS, Novosibirsk, Russia;*
Andrey Palyanov, *A.P. Ershov Institute of Informatics Systems, SB RAS, Novosibirsk, Russia*

15.00 – 15.30	**Keynote report** **Mathematics of Covid – 19** S.I. Kabanikhin, O.I. Krivorotko, A.Yu. Prikhodko, N.M. Prokhoshin, M.A. Shishlenin, N.Yu. Zyatkov *The Institute of Computational Mathematics and Mathematical Geophysics, SB RAS, Novosibirsk, Russia*
15.30 – 16.00	**Runtime analysis of non – elitist evolutionary algorithms with fitness – proportionate selection on Royal Road functions** Anton Eremeev *The Institute of Scientific Information for Social Sciences, RAS, Moscow, Russia* *Omsk Branch of Sobolev Institute of Mathematics, Omsk, Russia*
16.00 – 16.30	**Phase Portraits of Gene Networks Models** Natalia Ayupova[1], Vladimir Golubyatnikov[1], Vyacheslav Gradov[2], Liliya Minushkina[2] [1]*Sobolev Institute of Mathematics, SB RAS, Novosibirsk, Russia* [2]*Novosibirsk State University Novosibirsk, Russia*
16.30 – 16.50	**Adjoint Ensemble Methods for Inverse Modeling of Biological Processes** Alexey Penenko[1], *Ulyana Zubairova[2], Alexey Doroshkov[2], Alexander Bobrovskikh[2]* [1]*Institute of Computational Mathematics and Mathematical Geophysics, SB RAS, Novosibirsk, Russia* [2]*Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia*
16.50 – 17.10	**Coffee – break**
17.10 – 17.30	**Stability of equilibrium points in a predator – prey model with delayed argument** Maria Skvortsova, Timur Yskak *Sobolev Institute of Mathematics, Novosibirsk, Russia*

17.30 – 17.50	**Digital Platform "Bioinformatics": System – Forming Solutions** Yurii Zybarev, Sergey Kratov *Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia*
17.50 – 18.10	**Anchored Bootstrap** Vadim Efimov[1,2], Kirill Efimov[3], Vera Kovaleva[4] [1]*Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia* [2]*Novosibirsk State University, Novosibirsk, Russia* [3]*IHNA&NPh RAS, Moscow, Russia* [4]*ISEA SB RAS, Novosibirsk, Russia*
18.10 – 18.30	**Autoencoder – based Lowdeg – Rank Spectral Ensemble Clustering of Biological Data** Vladimir Berikov *Sobolev Institute of Mathematics, SB RAS, Novosibirsk, Russia*
18.30 – 18.50	**Multi – class brain tumor segmentation via multi – sequences MRI mixture data preprocessing.** Andrey Letyagin[1], Sergey Golushko[2], Mikhail Amelin[3], Bair Tuchinov[2], Evgeniya Amelina[2], Nikolay Tolstokulakov[2], Evgeniy Pavlovskiy[2], Vladimir Groza[4] [1]*Research Institute of Clinical and Experimental Lymphology, Branch of IC&G SB RAS, Novosibirsk, Russia* [2]*Novosibirsk State University, Novosibirsk, Russia* [3]*FSBI "Federal Neurosurgical Center", Novosibirsk, Russia* [4]*Median Technologies, Valbonne, France*

8 July, Wednesday

Computer Class

Evening Session 2. Mathematical issues of systems biology

Chair: ***Matteo Barberis, University of Surrey Guildford, Surrey, United Kingdom; S.A. Lashin, Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia***

14.30 – 15.00	**PLENARY REPORT** **Understanding the evolution of complex regions in bird genomes** Alexander Sang-Jae Suh, *Department of Evolutionary Biology, Uppsala University, Uppsala, Sweden*

15.00 – 15.30	**Keynote report** **A computational approach to investigation of *C. elegans* backwards crawling mechanism via simulation of involved nervous and muscular cells activity driving body movement** *Andrey Yu. Palyanov*[1,2], Natalia V. Palyanova[3] [1]*A.P. Ershov Institute of Informatics Systems, SB RAS, Novosibirsk, Russia* [2]*Novosibirsk State University, Novosibirsk, Russia* [3]*Institute of Molecular Biology and Biophysics, Novosibirsk, Russia*
15.30 – 16.00	**Keynote report** **Software frameworks for modeling complex hierarchical biological systems** *S.A. Lashin* *Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia*
16.00 – 16.10	**MGSGenerator 1.5: software tool for reconstructing mathematical models of metabolic networks** F.V. Kazantsev[1], S.A. Lashin[1,2] [1]*Kurchatov genomics center Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia* [2]*Novosibirsk State University, Novosibirsk, Russia*
16.10 – 16.30	**Motility and fitness of microorganisms in dynamic aquatic ecosystems: a simulation study** A.I. Klimenko, Yu.G. Matushkin, S.A. Lashin *Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia*
16.30 – 16.50	**BioUML – universal platform for analyses of biomedical data** Fedor A. Kolpakov[1,2], Anna S. Ryabova[1,2], Elena O. Kutumova[1,2], Ivan S. Evshin[1,2], Yury V. Kondrakhin[1,2], Nikita V. Mandrik[1,2], Ilya N. Kiselev[1,2], Sergey S. Pintus[1,2], Alexander E. Kel[2,3] [1]*Institute of Computational Technologies SB RAS, Novosibirsk, Russia* [2]*BIOSOFT.RU, LLC, Novosibirsk, Russia* [3]*geneXplain GmbH, Wolfebuttel, Germany*
16.50 – 17.10	**Coffee – break**
17.10 – 17.30	**Systems biology analysis of metabolism, signaling and gene expression regulation in human skeletal muscle** Ilya R. Akberdin[1,2,3], Alexander Yu. Vertyshev[4], Ilya N. Kiselev[1,5], Pavel A. Makhnovskii[6], Fedor A. Kolpakov[1,5], Sergey S. Pintus[1,5], Daniil V. Popov[6] [1]*BIOSOFT.RU, LLC, Novosibirsk, Russia* [2]*Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia* [3]*Novosibirsk State University, Novosibirsk, Russia*

	[4]*CJSC "Sites – Tsentr" Moscow, Russia* [5]*Institute of Computational Technologies SB RAS, Novosibirsk, Russia* [6]*Institute of Biomedical Problems of the RAS, Moscow, Russia*
17.30 – 17.50	**Genome – scale metabolic modeling of 2,3 – butanediol production by *Geobacillus icigianus*** Mikhail Kulyashov[1,2,3], Ilya R. Akberdin[1,3,4] [1]*BIOSOFT.RU, LLC, Novosibirsk, Russia* [2]*Institute of Computational Technologies SB RAS, Novosibirsk, Russia* [3]*Novosibirsk State University, Novosibirsk, Russia* [4]*Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia*
17.50 – 18.10	**Modeling the mutual relationship between the circadian clock and inflammation response** Nikolay Podkolodnyy, Natalya Tverdokheb, Olga Podkolodnaya *Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia*
18.10 – 18.30	***In silico* model of glioma MTS growth. Effects of compression and mechanical ECM remodeling** Vladimir Kalinin *R&D Sector of TMA, Dundalk, Ireland*
18.30 – 18.50	**SINE and LINE – 1 competition for energy resources determines cell fate** Maria Duk[1], Alexandra Chertkova[2,3], Vitaly Gursky[1,2], Maria Samsonova[2], Alexander Kanapin[4], Anastasia Samsonova[4] [1]*The Ioffe Institute, St. Petersburg, Russia; St. Petersburg University, St.Petersburg, Russia* [2]*Peter the Great St.Petersburg Polytechnic University, St.Petersburg, Russia* [3]*BioCAD, St.Petersburg, Russia* [4]*St. Petersburg State University, St.Petersburg, Russia*

Poster session

Session 1. Systems computational biology

A Model of one Central Regulatory Circuit
Tatyana Bukharina[1], Andrey Akinshin[2], Vladimir Golubyatnikov[2], Dagmara Furman[1,3]
[1]*Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia*
[2]*Sobolev Institute of Mathematics, SB RAS, Novosibirsk, Russia*
[3]*Novosibirsk State University, Novosibirsk, Russia*

Development of a method for recognizing biomedical entities in the texts of scientific articles
Stepan Derevyanchenko[1], Pavel Demenkov[2]
[1]Novosibirsk State University Novosibirsk, Russia
[2]Institute of Cytology and Genetics, SB RAS, Novosibirsk**, Russia**

Mathematical model of punctuated equilibrium evolution
Vitaly A. Likhoshvai, Tamara M. Khlebodarova
Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia

Gene Network of Type 2 Diabetes: Reconstruction and Analysis
Vladimir Zamyatin[1,2], Dmitry Afonnikov[1,2], Zakhar Mustafin[1,2], Vadim Klimontov[1,2],
Yury Matushkin[1,2], Sergey Lashin[1,2]
[1]Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia
[2]Novosibirsk State University, Novosibirsk, Russia

Integration of transcriptomics data into a genome – scale metabolic model of the methanotrophic bacterium *Methylotuvimicrobium alcaliphilum* 20Z^{R}
Mikhail Kulyashov[1,2,3,4], Semyon K. Kolmykov[1,2,4], Ivan S. Evshin[1,3], Tamara M. Khlebodarova[2], Nikita V. Ivanisenko[2], Ilya R. Akberdin[1,2,4]
[1]BIOSOFT.RU, LLC, Novosibirsk, Russia
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[3]Institute of Computational Technologies, SB RAS, Novosibirsk, Russia
[4]Novosibirsk State University, Novosibirsk, Russia

Transfer of Genetic Algorithms to Directed Evolution of Macromolecules: Tests *in silico*
Ekaterina Myasnikova[1], Alexander Spirov[2]
[1]Peter the Great St. Petersburg Polytechnical University Saint – Petersburg, Russia
[2]I.M. Sechenov Institute of Evolutionary Physiology and Biochemistry Russian Academy of Sciences Saint – Petersburg, Russia

ECM stiffness effects and subtumor formation in glioma growth. *In silico* model
Vladimir Kalinin
R&D Sector of TMA, Dundalk, Ireland

Development and analysis of AIDS epidemic agent – based computer model applying an algorithm for explicit calculation of HIV replicability
Anna Smirnova[1,2], Mikhail Ponomarenko[1], Sergey Lashin[1,2]
[1]ICG SB RAS, Novosibirsk, Russia
[2]NSU, Novosibirsk, Russia

Session 2. Mathematical issues of systems biology

Named entity recognition in medical texts in Russian using deep learning models
I.V. Moskalev, L.A. Khvorova
ASU, Barnaul, Russia

The algorithm for finding potentially oscillating behavior in enzymatic systems
Tatiana N. Lakhova[1], Fedor V. Kazantsev[1], Yuriy G. Matushkin[2], Sergey A. Lashin[1,3]
[1]*Kurchatov genomics center ICG SB RAS, Novosibirsk, Russia*
[2]*Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia*
[3]*Novosibirsk State University, Novosibirsk, Russia*

SYMPOSIUM
Bioinformatics and systems biology of plants

Oral reports

8 July, Wednesday

Small Conference Hall

Morning session. Bioinformatics and systems biology of plants

Chair: *Elena* Salina, *Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia;*
Victoria Mironova, *Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia; NSU, Novosibirsk, Russia*

9.00 – 9.30 **PLENARY REPORT**
Human Genome, Anesthesiology and Critical Care. 20 Years Later
Vladimir Zelman,

	Keck School of Medicine - USC
9:40 – 10:00	**Meta – analysis of transcriptome data clarified hormonal regulation of cold stress response in *Arabidopsis thaliana* L.** Nadezda Omelyanchuk[1], Yana Sizentsova[1], Victoria Mironova[1,2] *[1]Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia* ***[2]Novosibirsk State University, Novosibirsk, Russia***
10:00 – 10:20	**Transcriptomic mechanisms of *Solanum tuberosum* defensive response to golden potato nematode infestation** Alexey Kochetov[1], Kseniya Strygina[2], Elena Khlestkina[2], Egorova Anastasiya[1], Dmitry Afonnikov[1], Sophia Gerasimova[1], Anastasiya Glagoleva[1], Nickolay Shmakov[1] *[1]Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia* *[2]VIR, St. Petersburg, Russia*
10:20 – 10:40	**EIN3 binding site architecture guides transcriptional response to ethylene in Arabidopsis** Vladislav Dolgikh[1], Victor Levitsky[1], Elena Zemlyanskaya[1,2], Dmitry Oshchepkov[1] *[1] Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia* *[2]NSU, Novosibirsk, Russia*
10:40 – 11:00	**Features of the organization of bread wheat 5BS chromosome region carrying the leaf rust resistance gene *Lr52*** Maria Bragina[1], Dmitriy Afonnikov[1,2], Elena Salina[1] *[1]Kurchatov Genomic Center, ICG SB RAS, Novosibirsk, Russia* *[2]NSU, Novosibirsk, Russia*
11:00 – 11:20	**Symmetry and Asymmetry in Bacterial and Organellae Genomes** Michael Sadovsky, Maria Senashova *ICM SB RAS, Krasnoyarsk, Russia*
11:20 – 11:40	**Coffee break**
11:40 – 12:10	**Spikes morphometric characteristics analysis of five species of wheat** Evgeniy Komyshev[1], Yuliya Kruchinina[1], Mikhail Genaev[1,2], Vasiliy Koval[1], Dmitry Afonnikov[1,2], Nikolay Goncharov[3] *[1]Kurchatov Genomic Center, ICG SB RAS, Novosibirsk, Russia* *[2]NSU, Novosibirsk, Russia* *[3]Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia*

12:10 – 12:30	**Keeping the gate closed: WOX5 supports the balance between the proximal and distal root meristems via auxin biosynthesis in *Arabidopsis thaliana* L.** Maria Savina[1], Nadezda Omelyanchuk[1], Taras Pasternak[2], Victoria Mironova[1,3], Viktoriya Lavrekha[1] *[1]ICG SB RAS, Novosibirsk, Russia* *[2]Institute of Biology II/Molecular Plant Physiology University of Freiburg, Freiburg, Germany* *[3]Novosibirsk State University*
12:30 – 12:50	**Genetic regulation of wheat inflorescence development** Oxana B. Dobrovolskaya[1,2], Alina E. Dresvyannikova[2], Petr Martinrk[3] *[1]VNIIKR, Moscow region, Ramenskoe distinct, Bykovo, Russia* *[2]Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia* *[3]Agrotest Fyto, Ltd, Kroměříž, Czech Republic*
12:50 – 13.10	**Estimation of a joint distribution for several phenotypic traits in breeding or ancient populations** Anna A. Igolkina[1], Sergey Nuzhdin[1,2], Maria G. Samsonova[1] *[1]SPbPU, St.Petersburg, Russia* *[2]UCS, Los Angeles, USA*
13:10 – 14:30	**Lunch**

Evening session. Bioinformatics and systems biology of plants

Chairs: Elena Salina, *Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia;*
Elena Zemlyanskaya, *Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia; NSU, Novosibirsk, Russia*

14.30 – 15.00	**PLENARY REPORT** **Understanding the evolution of complex regions in bird genomes** Alexander Sang-Jae Suh, *Department of Evolutionary Biology, Uppsala University, Uppsala, Sweden*
15:00 – 15:30	**Amyloidogenic properties of the beta – barrel proteins and their involvement in storage of nutrients in plant seeds and bacteria virulence** *Nizhnikov Anton[1,2]* *[1]ARRIAM, St. Petersburg, Russia, St. Petersburg State University*

	[2]*St. Petersburg State University, St. Petersburg, Russia*
15:30 – 15:50	**Simulation climatic model for time to flowering in wild chickpea** Andrey Ageev[1], Abdullah Kahraman[2], Sergey Nuzhdin[1,3], Jens Berger[4], Abdulkadir Aydogan[5], Maria Samsonova[1], Eric Bishop – von Wettberg[6], Douglas Cook[7], Konstantin Kozlov[1] [1]*SPbPU, St.Petersburg, Russia* [2]*Harran University, Sanliurfa, Turkey* [3]*USC, LA, CA, USA* [4]*CSIRO, WA, Australia* [5]*CRIFC, Ankara, Turkey* [6]*UVM, VT, USA* [7]*UC Davis, CA, USA*
15:50 – 16:10	***MtWOX9 – 1* gene as somatic embryogenesis stimulator. Search of targets** Varvara Tvorogova, Ksenia Kuznetsova, Elizaveta Krasnoperova, Elina Potsenkovskaya, Andrei Kudriashov, Ludmila Lutova *SPSU, St.Petersburg, Russia*
16:10– 17:10	**Coffee break**
17:10 – 17:30	**Identifying novel elements and regulators in auxin – dependent gene expression** Daria Novikova[1], Dolf Weijer[2], Nadezda Omelyanchuk[1], Victoria Mironova[1] [1]*Institute of Cytology and Genetics SB RAS, Novosibirsk, Russia* [2]*Wageningen University and Research, Wageningen, Netherlands*
17:30 – 17:50	**Targeted mutagenesis of the *HvMyc2* and *HvAnt2* genes in *Hordeum vulgare* L.** Anastasiya Egorova[1,2,3], Christian Hertig[3], Alexander Vikhorev[1,2], Ksenia Strygina[4], Iris Koeppel[3], Sophia Gerasimova[1,2], Elena Khlestkina[4], Olesya Shoeva[1], Stefan Hiekel[3], Jochen Kumlehn[3] [1]*Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia* [2]*NSU, Novosibirsk, Russia* [3]*IPK, Gatersleben, Germany* [4]*VIR, St.Petersburg, Russia*
17:50 – 18:10	**The meta – analysis of transcriptomes of Arabidopsis thaliana transgenic plants with altered expression of dual – targeting RNA – polymerase RPOTmp** Igor Gorbenko, Vadim Belkov, Vladislav Tarasenko, Yuri Konstantinov, Alexander Katyshev, Milana Koulintchenko *SIPPB SB RAS, Irkutsk, Russia*

18:10 – 18:30

Transcripts Specifically Expressed During Secondary Vascular Development in *Arabidopsis thaliana* L.

Nadezda Omelyanchuk[1,2], Dmitry Oshchepkov[1], Evgeniya Pukhovaya[1,2], Victoria Mironova[1]
[1]*Institute of Cytology and Genetics SB RAS, Novosibirsk, Russia*
[2]*Novosibirsk State University, Novosibirsk, Russia*

18:30 – 18:50

Exploring Interaction Between Metabolic Pathways Involved In Pigmentation Of Barley Spike

Anastasiia Glagoleva[1], Nikolay A. Shmakov[1], Aleksandr V. Vikhorev[1,2], Sergei R. Mursalimov[1], Natalia V. Gracheva[3], Tatjana V. Kukoeva[1], Olesya Yu. Shoeva[1], Elena K. Khlestkina[1,4]
[1]*Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia*
[2]*Novosibirsk State University, Novosibirsk, Russia*
[3]*VSTU, Volgograd, Russia*
[4]*VIR, Saint – Petersburg, Russia*

18:50 – 19:00

Development of DNA markers for identification of a quarantine weed, silverleaf nightshade (*Solanum elaeagnifolium* Cav.), based on chloroplast intergenic spacers

Ekaterina Volodina[1], Y.Y. Kulakova[1], O. B. Dobrovolskaya[1,2], M.S. Anisimenko[1]
[1]*VNIIKR, Bykovo, Russia*
[2]*ICG SB RAS, Novosibirsk, Russia*

Poster session

Effects of anthocyanin – rich grain diet on growth and metastasis of Lewis lung carcinoma in mice

Michael V. Tenditnik[1], Nelly A. Popova[2], Maria A. Tikhonova[1], Tamara G. Amstislavskaya[1], Ekaterina A. Litvinova[1], Elena K. Khlestkina[3,2]
[1]*Scientific Research Institute of Physiology and Basic Medicine, Novosibirsk, Russia*
[2]*Federal Research Center "Institute of Cytology and Genetics", Novosibirsk, Russia*
N.I. Vavilov All – Russian Research Institute of Plant Genetic Resources, St. Petersburg, Russia

Molecular markers based on SNPs in *FAD3* genes for determination of linolenic acid content in flax seed

Liubov Povkhova[1,2], Elena Pushkova[1], Alexey Dmitriev[1], Parfe Kezimana[1,3], Roman Novakovskiy[1], Nataliya Melnikova[1], Tatiana Rozhmina[1,4], George Krasnov[1]
[1]*Engelhardt Institute of Molecular Biology, RAS, Moscow, Russia;*
[2]*Moscow Institute of Physics and Technology, Dolgoprudny, Russia*
[3]*RUDN University, Moscow, Russia*
[4]*Federal Research Center for Bast Fiber Crops, Torzhok, Russia*

Flowering patterns of herbaceous multi – flowered monocarpic shoots of Campanula sarmatica

Fomin Eduard Fomin

Wheat and maize miRNAs are potential regulators of human genes expression
Aizhan Kazievna Rakhmetullina, Anatoliy Timofeevich Ivashchenko, Anna Yurevna Pyrkova
Al – Farabi Kazakh National University, Almaty, Kazakhstan

The characteristics of interaction of miRNA with mRNA of C2H2, ERF and GRAS transcription factors of arabidopsis, rice and maize
Aizhan Kazievna Rakhmetullina, Svetlana Kazbekovna Turasheva, Anna Yurevna Pyrkova
Al – Farabi Kazakh National University, Almaty, Kazakhstan

Genome – wide Prediction of Transcription Start Site in Four Conifer Species
Eugeniia I. Bondar[1,2], Vadim V. Sharov[1,2], Dmitry A. Kuzmin[1], Tatiana V. Tatarinova[1,3,4,5], Konstantin V. Krutovsky[1,6,4,7]
[1]*Siberian Federal University, Krasnoyarsk, Russia*
[2]*FRC KSC SB RAS, Krasnoyarsk, Russia*
[3]*University of La Verne, La Verne, USA*
[4]*Vavilov Institute of General Genetics, Moscow, Russia*
[5]*Bioinformatics Center of IITP RAS, Moscow, Russia*
[6]*Georg – August University of Göttingen Göttingen, Germany*
[7]*Texas A&M University, College Station, TX, USA*

Molecular genetic analysis of alloplasmic recombinant lines (*Triticum dicoccum*) – *Triticum aestivum*
Andrey Borisovich Shcherban[1], Roman Nikolaevich Perfil'ev[2], Elena Artemovna Salina[1]
[1]*Institute of Cytology and Genetics SB RAS, Novosibirsk, Russia*
[2]*Novosibirsk State Agrarian University*

Genome – wide analysis of highly expressed plant retrotransposons
Murad Omarov, Pavel Merkulov, Sofia Gvaramia, Liza Kolganova, Ilya Kirov
All – Russia Research Institute of Agriculture biotechnology, Moscow, Russia

The prospects for the study of the avirulence genes characteristic for the West Siberian population of wheat stem rust Puccinia graminis f. sp. Tritici
Vasiliy Kelbin, Ekaterina Sergeeva, Elena Salina, Ekaterina Skolotneva
Institute of Cytology and Genetics SB RAS, Novosibirsk, Russia

Retrotransposons of Arabidopsis thaliana expressed in wild – type plants
Sofya Gvaramiya, Murad Omarov, Ilya Kirov
All – Russia Research Institute of Agricultural Biotechnology, Moscow, Russia

Identification of an AP2/ERF Transcription Factor Controlling the Synthesis of Barley Epicuticular Wax

Ekaterina Kolosovskaya[1], Christian Hertig[2], Dmitriy Domrachev[3], Alexey Kochetov[1], Sophia Gerasimova[4], Sergey Morozov[3], Vikhorev Alexander[1,4], Jochen Kumlehn[2], Anna Korotkova[1], Elena Chernyak[2], Nikolay Shmakov[1], Elena Khlestkina[1,4,5]
[1]*Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia*
[2]*Leibniz Institute of Plant Genetics and Crop Plant Research (IPK), Gatersleben, Germany*
[3]*Novosibirsk Institute of Organic Chemistry, SB RAS, Novosibirsk, Russia*
[4]*NSU, Novosibirsk, Russia*
[5]*Vavilov Institute of Plant Genetic Resources (VIR), Saint Petersburg, Russia*

Genomic analysis of Vavilov's historic chickpea landraces using GWAS, AMMI and GGE biplot analyses
Alena Sokolkova[1], Noelia Carrasquila – Garcia[2], Douglas R. Cook[2], Sergey V. Bulyntsev[3], Eric von Wettberg[4], Sergey V. Nuzhdin[5], Peter L. Chang[5], Margarita A. Vishnyakova[3], Maria G. Samsonova[6]
[1]*Peter the Great St. Petersburg Polytechnic University, St. Petersburg, Russia*
[2]*University of California Davis, Department of Plant Pathology, Davis, CA 95616 USA*
[3]*Federal Research Centre All – Russian N.I. Vavilov Institute of Plant Genetic Resources (VIR), St. Petersburg, Russia*
[4]*University of Vermont, Department of Plant and Soil Science, Burlington, VT 05405, USA*
[5]*University of Southern California, Program in Molecular and Computational Biology, Dornsife College of Letters Arts & Sciences, Los Angeles, USA*
[6]*Peter the Great St. Petersburg Polytechnic University, Department of Applied Mathematics, St. Petersburg, Russia*

Analysis of agronomic traits of mungbean (Vigna radiata) accessions from the World Vegetable Gene Bank (Taiwan)
Alena Sokolkova[1], Margarita A. Vishnyakova[2], Chau – Ti Ting[3], Marina Burlyaeva[2], Roland Schafleitner[4], Sergey V. Nuzhdin[5], Eric von Wettberg[6], Tatjana Valiannikova[7], Cheng – Ruei Lee[3], Maria G. Samsonova[8]
[1]*Peter the Great St. Petersburg Polytechnic University, St. Petersburg, Russia*
[2]*Federal Research Centre All – Russian N.I. Vavilov Institute of Plant Genetic Resources (VIR), St. Petersburg, Russia*
[3]*National Taiwan University, Taipei 106, Taiwan*
[4]*World Vegetable Center, Shanhua, Tainan 74199, Taiwan*
[5]*University of Southern California, Program in Molecular and Computational Biology, Dornsife College of Letters Arts & Sciences, Los Angeles, USA*
[6]*University of Vermont, Department of Plant and Soil Science, Burlington, VT 05405, USA*
[7]*Kuban Branch of Federal Research Centre All – Russian N.I. Vavilov Institute of Plant Genetic Resources (VIR), Krasnodar region, Russia*
[8]*Peter the Great St. Petersburg Polytechnic University, Department of Applied Mathematics, St. Petersburg, Russia*

STUDY OF THE ROOT TRANSCRIPTOME OF BREAD WHEAT USING HIGH – THROUGHPUT RNA SEQUENCING (RNA – SEQ)
Alexandr Vikhorev[1,2], Elena Khlestkina[2,3], Nikolay Shmakov[2], Olesya Shoeva[2], Anastasia Glagoleva[2]
[1]*Novosibirsk State University, Novosibirsk, Russia*
[2]*Institute of Cytology and Genetics SB RAS, Novosibirsk, Russia*
[3]*All – Russian Institute of Plant Recources, Saint – Petersburg, Russia*

Btr1 genes and the evolution of wheat and *Aegilops* species
Valeriya Vavilova, Irina Konopatskaia, Nikolay P. Goncharov, Alexandr Blinov

[2]*Institute of Cytology and Genetics SB RAS, Novosibirsk, Russia*

Regulation of Transcription Activity of MAKR4 in *Arabidopsis thaliana L*.
Anastasia Korosteleva[1], Daria Novikova[2], Victoria Mironova[2]
[1]*Novosibirsk State University, Novosibirsk, Russia*
[2]*Institute of Cytology and Genetics SB RAS, Novosibirsk, Russia*

Analysis of repeatomes in Cannabaceae family
Julia Bocharkina[1,2], Olga Razumova[1], Gennady Karlov[1]
[1]*All – Russia Research Institute of Agricultural Biotechnology, Moscow, Russia*
[2]*Skolkovo Institute of science and technology, Moscow, Russia*

Comparative genomic analysis of male and female poplars
Elena Pushkova, Nadezhda Bolsheva, George Krasnov, Nataliya Melnikova, Roman Novakovskiy, Alexey Dmitriev
Engelhardt Institute of Molecular Biology, RAS, Moscow, Russia

Comparative analysis of flax (*Linum usitatissimum* L.) genomes and transcriptomes
Elena Pushkova[1], Liubov Povkhova[1,2], Tatiana Rozhmina[1,3], George Krasnov[1], Artemy Beniaminov[1], Alexey Dmitriev[1], Roman Novakovskiy[1], Nadezhda Bolsheva[1], Nataliya Melnikova[1]
[1]*Engelhardt Institute of Molecular Biology, RAS, Moscow, Russia*
[2]*Moscow Institute of Physics and Technology, Dolgoprudny, Russia*
[3]*Federal Research Center for Bast Fiber Crops, Torzhok, Russia*

Complete sequencing of barley organellar genomes: new data for intraspecific differentiation
Yermakovich (Makarevich) Anna, Liaudanski Aleh, Siniauskaya Maryna, Davydenko Oleg, Halayenka Innesa*IGS NAS of Belarus, Minsk, Belarus*

SeedCounter – mobile application for high throughput grain phenotyping
Mikhail Genaev[1,2], Komyshev Evgeny[1], Dmitry Afonnikov[1,2]
[1]*ICG SB RAS, Kurchatov Genomic Center, Novosibirsk, Russia*
[2]*NSU, Novosibirsk, Russia*

Application of neural networks to image recognition of wheat rust diseases
Mikhail Genaev[1,2], Skolotneva Ekaterina [1], Dmitry Afonnikov[1,2]
[1]*ICG SB RAS, Kurchatov Genomic Center, Novosibirsk, Russia*
[2]*NSU, Novosibirsk, Russia*

Detection and investigation of genes with circadian expression pattern in common wheat

Antonina Kiseleva, Maria Bragina, Elena Salina
Institute of Cytology and Genetics SB RAS, Novosibirsk, Russia

Identification of genetic factors responsible for symbiotic effectiveness in pea (*Pisum sativum* L.)
Aleksandr Zhernakov[1], Igor Tikhonovich[1,2], Oksana Shtark[1], Vladimir Zhukov[1], Olga Kulaeva[1]
[1]ARRIAM, St.Petersburg, Russia
[2]Saint – Petersburg State University, Saint – Petersburg, Russia

New insight on diversity of the Nikita Botanical Gardens plant collections from advanced NGS
Irina Mitrofanova, Svetlana Chelombit, Olga Krivenko, Valentina Brailko, Olga Kuleshova, Olga Mitrofanova
NBG – NSC RAS, Yalta, Russia

SECTION
Structural Computational Biology

Oral reports

9 July, Thursday

Computer Class

Chairs: Vladimir Poroikov, *Institute of Biomedical Chemistry, Moscow, Russia*
Vladimir Ivanisenko, *Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia; Novosibirsk State University, Novosibirsk, Russia*

14.30 – 15.00 **PLENARY REPORT**
Brain Asymmetries in the Cognitive Processing
Boris M. Velichkovsky
Corresponding Member of the Russian Academy of Science, Member of Academia Europaea

15:00 – 15:30	**Keynote report** **Computer – aided approaches to discovery of novel pharmaceutical agents for COVID – 19 therapy** *Vladimir Poroikov,* *Institute of Biomedical Chemistry, Moscow, Russia*
15:30 – 15:50	**Computer tools for modelling and prediction of natural RNA structure: a case study of miRNAs and group II introns** Igor Titov *Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia*
15:50 – 16:10	**Computer analysis of aminoacid residue patterns in protein 3d structure similar to functional sites.** V.A. Ivanisenko, N.V. Ivanisenko, N.A. Kolchanov *Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia*
16:10 – 16:30	***Learning the changes of barnase mutants thermostability from structural fluctuations obtained using anisotropic network modeling*** Nikolay Alemasov, Nikita Ivanisenko, Vladimir Ivanisenko *Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia*
16:30 – 16:40	**Coffee – break**
16:40 – 17:00	**Mustguseal: versatile bioinformatic platform for knowledge – based protein design and modulation** Dmitry Suplatov[1,2], Yana Sharapova[1,2], Vytas Švedas[1,2] [1]*Belozersky Institute of Physicochemical Biology, Moscow, Russia* [2]*Lomonosov Moscow State University, Moscow, Russia*
17:00 – 17:20	**Model for Stacking Monomers in Filamentous Actin** Anna Glyakina[1,2], Alexey Surin[2,3], Oxana Galzitskayaova[2] [1]*IMPB RAS, Pushchino, Russia* [2]*Institute of Protein Research RAS, Pushchino, Russia* [3]*Pushchino Branch, Shemyakin–Ovchinnikov Institute of Bioorganic Chemistry, RAS, Pushchino, Russia*
17:20 – 17:40	**Parallel Bias Metadynamics and Sketch – map Dimensionality Reduction as Powerful Tools to Explore Free Energy Landscapes of Intrinsically Disordered Peptides** Olga Rogacheva[1,2], Omar Valsson[3], Olga Shamova[2] , Andrey Badanin[1] [1]*SPbU, St. Petersburg, Russia* [2]*FSBRI "IEM", St. Petersburg, Russia* [3]*MPIP, Mainz, Germany*

17:40 – 18:00	**An effective molecular blockers of ion channel of M2 protein as anti – influenza A drug** Yury Nikolaevich Vorobjev *Institute of Chemical Biology and Fundamental Medicine, SB RAS, Novosibirsk, Russia*
18:00 – 18:10	**Coffee – break**
18:10 – 18:30	**Extraction of spectral series of ions from mass spectra of peptides by methods of integral transforms and machine learning** Eduard Fomin, Nikolay Alemasov, Dmitriy Afonnikov *Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia*
18:30 – 18:50	**Modeling of single – molecule FRET – experiments on protein folding: From coarse – grained to all – atom simulations** Vladimir A. Andryushchenko[1,2], Sergei F. Chekmarev[1] *[1]IT SB RAS, Novosibirsk, Russia* *[2]NSU, Novosibirsk, Russia*
18:50 – 19:10	**3D agent – based modeling of some aspects of the interaction between microtubules and microfilaments in cell** Marat Sabirov, Alexander Spirov I.M. Sechenov Institute of Evolutionary Physiology and Biochemistry Russian Academy of Sciences Saint – Petersburg, Russia
19:10 – 19:30	**Advanced laser technologies for targeted nuclear nanomedicine** Irina Zavestovskaya *National Research Nuclear University MEPhI, Moscow, Russia* *The Lebedev Physical Institute, Moscow, Russia*

Poster session

Searching for Alternatively Splicing Group II Introns
Nikolay Kobalo[1], Denis Vorobyev[2], Igor Titov[3], Alexander Kulikov[1]
[1]The Institute of Computational Mathematics and Mathematical Geophysics, Novosibirsk, Russia
[2]Gustave Roussy Cancer Center, Villejuif, France
[3] Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia

The properties of the C – terminal domain of HlyIICTD suggest that B. cereus HlyII is a representative potential member of trimeric autotransporter adhesins among gram – positive bacteria.
Siunov A.V. [a], Nagel A. S. [a], Andreeva – Kovalevskaya Z. I. [a], Zamyatina A.V. [b, c], Rudenko N.V.[b, c], Karatovskaya A.P.[c], Borisova M. P.[d], Brovko F.A [b, c], Salyamov V. I. [a], A.S. Solonin [a, b]
a G. K. Skryabin Institute of Biochemistry and physiology of microorganisms RAS 5 Prospekt Nauki, Pushchino, Moscow Region 142290, Russia
b Pushchino State Institute of Natural Sciences, 3 Prospekt Nauki, Pushchino, Moscow Region 142290, Russia

c Pushchino Branch, Shemyakin–Ovchinnikov Institute of Bioorganic Chemistry, 6 Prospekt Nauki, Pushchino, Moscow Region 142290, Russia
d Institute of Theoretical and Experimental Biophysics, Russian Academy of Sciences, Pushchino, Moscow region, 142290, Russia

Competition and collaboration in the miRNA science field
Artemiy Firsov[1], Igor Titov[2]
[1]Computer Science and Computer Engineering, Institute of Informarics Systems, Novosibirsk, Russia
[2] Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia

Errors in miRNA Recognition
Pavel Vorozheykin[1], Igor Titov[1,2]
[1]NSU, Novosibirsk, Russia
[2] Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia

An architecture – independent algorithm for microRNA target prediction
Natalya Fokina, Alexander Grinev
Moscow State Medical University Moscow, Russia

Nuclear envelope rupture in Drosophila D11 cells inhibit mitosis
Snezhanna Sergeevna Saydakova[1,2], Gera Alekseevna Pavlova[3], Ksenia Nikolaevna Morozova[1], Elena Vladimirovna Kiseleva[1]
[1]Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia
[2]NSU, Novosibirsk, Russia
[3]IMCB SB RAS Novosibirsk, Russia

Consideration of pathogenicity of nsSNVs in CDKN2A gene, as a new tumor marker for leukemia, using bioinformatics methods
Farzaneh Ghasemi[1], Mehri Khatami[1], Mohammad Mehdi Heidari[1], Yuriy L. Orlov[2,3]
[1]Yazd University, Yazd, Iran
[2]I.M. Sechenov First Moscow State Medical University, Moscow, Russia
[3]Novosibirsk State University,Novosibirsk, Russia

easyAmber: a step away from inefficient "static" approaches towards a deeper understanding of protein dynamics
Dmitry Suplatov[1,2], Yana Sharapova[1,2], Vytas Švedas[1,2]
[1]Belozersky Institute of Physicochemical Biology, Moscow, Russia
[2]Lomonosov Moscow State University, Moscow, Russia

Beta – Bends As An Example Of Conformationally Predetermined Segments Of Protein. Conditions Of Stabilization Of The Structure And Role Of Context
Anastasia A. Anashkina[1], Vladimir O. Chekhov[1], Ivan Yu. Torshin[2], Leonid A. Uroshlev[3], Natalia G. Esipova[1], Vladimir G. Tumanyan[1]
[1]EIMB RAS, Moscow, Russia
[2]FIC IU RAS, Moscow, Russia
[3]IGG RAS, Moscow, Russia

Modelling of Nef Interaction with ABCA1 Revealed Potential Binding Sites For Inhibitor Compounds
Anastasia A. Anashkina, Yaroslav V. Tkachev, Alexei A. Adzhubei
EIMB RAS, Moscow, Russia

Computer reconstruction of the ecological structure of intestinal microbiota communities based on high – throughput sequencing data
Andrew Kopochev[1], Alexandra Klimenko[1], S.A. Lashin[1,2]
[1]Kurchatov Genomics Center, Institute of Cytology and Genetics, ICG SB RAS, Novosibirsk, Russia
[2]Novosibirsk State University, NSU, Novosibirsk, Russia

Interpretation of the features of a linear regression model for predicting the survival time of the amyotrophic lateral sclerosis patients with mutated SOD1
Nikolay Alemasov[1], Shcherbakov Alexandr[2], Vladimir Timofeev[2], Vladimir Ivanisenko[1]
[1] Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia
[2]Novosibirsk State Technical University Novosibirsk, Russia

SECTION
Systems Biology of Aging

Oral reports

9 July, Thursday

Small Conference Hall

Chairs: Elena Pasyukova, *IMG RAS, Moscow, Russia*
Vyacheslav Mordvinov, *Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia*
Alexander Khokhlov, *Lomonosov Moscow State University, Moscow, Russia*

14.30 – 15.00	**PLENARY REPORT** **Brain Asymmetries in the Cognitive Processing** Boris M. Velichkovsky *Corresponding Member of the Russian Academy of Science, Member of Academia Europaea*
15:00 – 15:05	Welcoming address by the President of the Gerontological Society of the Russian Academy of Sciences Vladimir Anisimov, St. Petersburg, Russia
15:05 – 15:30	**Neuronal Transcription Factors in Lifespan Control** Alexander Symonenko, Natalia Roshina, Anna Krementsova, Elena Pasyukova *IMG RAS, Moscow, Russia*
15:30 – 15:50	**Evolution of Proteins Involved in Response to ROS** Vassily Lyubetsky[1], Gregory Shilovsky[1,2], Alexandr Seliverstov[1], Oleg Zverkov[1], Lev Rubanov[1] [1]*Institute for information transmission problems, RAS, Moscow, Russia* [2]*Lomonosov Moscow State University, Moscow, Russia*
15:50 – 16:10	**Gerontology and Scientometrics ("Citogerontology")** Alexander Khokhlov *Lomonosov Moscow State University, Moscow, Russia*

16:10 – 16:30	**Cholinergic Deficit in Olfactory Bulbectomized Animals as a Model of Neurodegenerative Diseases** Mikhail Stepanichev, Olga Nedogreeva, Natalia Lazareva, Anna Manolova, Natalia Gulyaeva *IHNA&NPh RAS, Moscow, Russia*
16:30 – 16:50	**Cellular senescence in age – related macular degeneration: impact of changes in autophagy and neurotrophic supplementation** Oyuna Kozhevnikova, Darya Telegina, Mikhail Tyumentsev, Nataliya Kolosova *Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia*
16:50 – 17:10	**Coffee break**
17:10 – 17:40	**Free Radical Theory of Aging: from Chemical Physics to Systems Theory of Reliability** *Vitaly Koltover* *Institute of Problems of Chemical Physics RAS, Chernogolovka, Russia*
17:40 – 18:00	**Cluster analysis of age – related trends of the expression of metabolically relevant genes in humans PBMCs** Aleksey Alekseev *Lomonosov Moscow State University, Moscow, Russia*
18:00 – 18:20	**Cellular response to UVA – B light depends on cellular age and chromatin structure** Bela Vasileva[1], Dessislava Staneva[1], Plamen Zagorchev[2], Natalia Krasteva[3], George Miloshev[1], Milena Georgieva[1] [1]*Institute of Molecular Biology "Acad. R. Tsanev" Bulgarian Academy of Sciences, Sofia, Bulgaria* [2]*Medical University – Plovdiv, Plovdiv, Bulgaria* [3]*Institute of Biophysics and Biomedical Engineering, Bulgarian Academy of Sciences, Sofia, Bulgaria*
18:20 – 18:40	**Is there a fecundity/longevity trade – off under heat stress?** Nataly Gruntenko, Evgenia Karpova, Elena Burdina, Natalya Adonyeva, Petr Menshanov, Inga Rauschenbach *Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia*
18:40 – 19:00	**Delay of early postnatal development as a risk factor for accelerated aging and Alzheimer's disease** Ekaterina Rudnitskaya, Tatiana Kozlova, Alena Burnyasheva, Natalia Stefanova, Nataliya Kolosova *Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia*
19:00 – 19:20	**Serum Polypeptide Alpha – Fetoprotein (AFP) as a Possible Powerful Geroprotector** Alexander Khalyavkin[1,2], Vyacheslav Krut'ko[2,3], Vitaly Dontsov[2] [1]*Institute of Biochemical Physics of RAS, Moscow, Russia* [2]*Federal Research Center "Computer Science and Control" of RAS Moscow, Russia* [3]*Sechenov First Moscow State Medical University Moscow, Russia*

Poster session

Possibility to use divergent tasks for baseline alpha rhythm modulation in older adults
Evgeniya Privodnova, Nina Volf, Ekaterina Merculova, Victoriya Bilik
Scientific Research Institute of Physiology and Basic Medicine, Novosibirsk, Russia

Spatial learning as activator of hippocampal neurogenesis during aging and development of Alzheimer's disease – like pathology
Alena Burnyasheva, Tatiana Kozlova, Ekaterina Rudnitskaya, Natalia Stefanova
Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia

Effects of melatonin and SkQ1 long – term treatment during aging and development AMD – like retinopathy
Darya Telegina, Oyuna Kozhevnikova, Anzhella Fursova
Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia

Age – related difference in use – dependent plasticity after divergent thinking session matches posterior – anterior shift in aging (PASA) model
Evgeniya Privodnova, Nina Volf, Ekaterina Merculova, Dariya Bazovkina
Scientific Research Institute of Physiology and Basic Medicine, Novosibirsk, Russia

Calorie Restriction in Gerontological Experiments on Cell Cultures
Galina Morgunova, Alexander Khokhlov
Lomonosov Moscow State University, Moscow, Russia

Lymph nodes morphology as predictor natural and premature aging
Olga Gorchakova[1], Vladimir Gorchakov[1,2], Georgy Demchenko[3]
[1]*Research institute of a clinical and experimental lymphology – branch of Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia*
[2]*Novosibirsk State University, Novosibirsk, Russia*
[3]*Institute of Physiology of Human and Animals of Committee of Science of the Ministry of Education and Science of the Republic of Kazakhstan, Almaty, Kazakhstan*

Nanobodies design for treatment of age – related diseases
Mohammad Mehdi Heidari[1], Yuriy Orlov[2,3]
[1]*Yazd University, Yazd, Iran*
[2]*Institute of Digital Medicine I.M.Sechenov First Moscow State Medical University, Moscow, Russia*
[3]*Novosibirsk State University, Novosibirsk, Russia*

MAPK pathways and alphaB – crystallin phosphorylation in brain: a focus on aging and Alzheimer's disease
Natalia Muraleva
Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia

Mitochondrial dysfunction and redox balance alterations in the development of AD – like pathology in OXYS rats
Mikhail Tyumentsev[1], Natalia Muraleva[1], Yulia Polienko[2], Artyom Gorodetsky[2], Elena Bagryanskaya[2]
ICG SB RAS; [2]NIOCH SB RAS, Novosibirsk, RUSSIA

Search for single nucleotide polymorphisms (SNPs) associated with hypertension in the genome of senescence – accelerated OXYS rats
Vasiliy Devyatkin, Natalia Muraleva, Olga Redina, Nataliya Kolosova
Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia

Way to longevity: role of antioxidant defense gene polymorphisms in successful adaptation
Vera Erdman[1], Timur Nasibullin[1], Ilsia Tuktarova[1], Ksenia Danilko[1], Olga Mustafina[1], Tatiana Viktorova[1], Alisa Matua[2]
[1]*IBG UFRC RAS, Ufa, Russia*
[2]*SRI EPT ASA, Sukhum, Abkhazia*

Oral reports

9 July, Thursday

Big Conference Hall

Morning session. Genomics, bioinformatics and evolution

Chairs: Igor Rogozin, *National Institutes of Health, USA*
Dmitry Afonnikov, *Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia*

9.00 – 9.30

PLENARY REPORT
Genetic Development of the Nociceptive System and the Epigenetics of the Experience of Pain
Jack M. Berger
Keck School of Medicine of USC, University of Southern California, Los Angeles, California, USA

9:30 – 10:00

Keynote report
Stop codons within prokaryotic protein – coding genes: Indication of frequent read – through events
Igor B. Rogozin
NCBI, Bethesda, USA

10:00 – 10:20

Homologous series. Law or rule?
Valentine Suslov, Mikhail Ponomarenko, Dmitry Rasskazov
Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia

10:20 – 10:40

Heat shock protein 90 as a long – term buffer of mutational burden
Valeria Timonina[1], Evgenii Tretiakov[2], Anastasia Sokol[1], Dmitry Knorre[3,4], Konstantin Gunbin[5], Konstantin Popadin[1,6]
[1]Immanuel Kant Baltic Federal University, Kaliningrad, Russia
[2]Medical University of Vienna, Vienna, Austria
[3]Belozersky Institute of Physico – Chemical Biology, Moscow, Russia
[4]Moscow State University, Moscow, Russia
[5]Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia

	[6]*Ecole Polytechnique Federale de Lausanne, Lausanne, Switzerland*
10:40 – 11:00	**Polygenic Transmission Disequilibrium of slightly – deleterious variants in Down Syndrome trios** Kseniia Sholokhova[1], Viktor Shamansky[1], Konstantin Gunbin[1,2], Konstantin Popadin[1,3] [1]*IKBFU, Kaliningrad, Russia* [2]*Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia* [3]*Ecole Polytechnique Federale de Lausanne, Lausanne, Switzerland*
11:00 – 11:20	**Tandem repeats are selfish elements which mark the level of hidden recombination in animal mitochondrial genomes** Aleksandr Smirnov[1], Konstantin Gunbin[1,2], Alina A. Mikhailova[1], Konstantin Popadin[1,3], Valeria Lobanova[1] [1]*Immanuel Kant Baltic Federal University, Kaliningrad, Russia* [2]*Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia* [3]*Ecole Polytechnique Federale de Lausanne, Lausanne, Switzerland*
11:20 – 11:40	**Coffee break**
11:40 – 12:00	**Analysis of the Associations between Missense Substitutions in the Human MT – ATP6 gene** Maria Golubenko, Alexey Zarubin *Research Institute of Medical Genetics, Tomsk NRMC, Tomsk, Russia*
12:00 – 12:20	**The genomes and mechanisms of adaptation to the cold climates in Russian native cattle breeds** Laura Buggiotti[1], Andrey Yurchenko[2], Nikolay Yudin[2], Denis M. Larkin[1,2] [1]*Royal Veterinary College, University of London, London, UK* [2]*Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia*
12:20 – 12:40	**Resequencing genomes of the Russian native Baikal and Tuva sheep breeds** James Sweet – Jones[1], Nikolay Yudin[2], Denis M. Larkin[1,2] [1]*Royal Veterinary College, University of London, London, UK* [2]*Institute of Cytology and Genetics, Novosibirsk, Russia*
12:40 – 13:00	**The genetic component of the human embryonic selection: uncovering of the strength and main targets** Sergey Oreshkov[1], Evgenii Tretiakov[2], Dmitrii Iliushchenko[1], Elisaveta Zezyulya[1], Konstantin Gunbin[1,3], Konstantin Popadin[1,4] [1]*Immanuel Kant Baltic Federal University, Kaliningrad, Russia* [2]*Medical University of Vienna, Vienna, Austria* [3]*Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia* [4]*Ecole Polytechnique Federale de Lausanne, Lausanne, Switzerland*

13:00 – 13:20	**mtDNA mammalian evolution: mice walk with many little steps while elephants with a few big ones** Dmitrii Iliushchenko[1], Anastasia Sokol[1], Konstantin Gunbin[1,2], Konstantin Popadin[1,3] *[1]Immanuel Kant Baltic Federal University, Kaliningrad, Russia* *[2]Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia* *[3]Ecole Polytechnique Federale de Lausanne, Lausanne, Switzerland*
13:20 – 13:35	**Laboratory of Genetic Analysis** Akopyan Nare Akopovna, *Department of Biochemistry and Biotechnology, Himmed Company, Moscow, Russia* Sponsor report – ***Himmed Company***
	Lunch

Evening session. Genomics, bioinformatics and evolution

Chairs: Vyacheslav Yurchenko, *University of Ostrava, Faculty of Science, Ostrava, Czech Republic*
Sergey Shekhovtsov, *Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia*

14.30 – 15.00	**PLENARY REPORT** **Brain Asymmetries in the Cognitive Processing** Boris M. Velichkovsky *Corresponding Member of the Russian Academy of Science, Member of Academia Europaea*
15:00 – 15:30	**Keynote report** **Non – stop trypanosomes** *Vyacheslav Yurchenko* *University of Ostrava, Ostrava, Czech Republic*
15:30 – 15:50	**Diversity and evolution of Tat LTR retrotransposon structures in non – flowering plants** Mikhail Biryukov, Kirill Ustyantsev *Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia*
15:50 – 16:10	**New data on Acanthobdellida phylogeny based on complete mitochondrial genomes** Alexander Bolbat[1], Gennadiy Vasiliev[2], Irina Kaygorodova[1], Vera Bogdanova[2] *[1]Limnological Institute SB RAS, Irkutsk, Russia* *[2]Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia*
16:10 – 16:30	**A genetic handicap approach: how to estimate the genome – wide burden of slightly – deleterious variants in a model population**

	Victor Shamanskiy[1], Konstantin Gunbin[2], Konstantin Popadin[1,3] *[1]Immanuel Kant Baltic Federal University, Kaliningrad, Russia* *[2]Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia* *[3]Ecole Polytechnique Federale de Lausanne, Lausanne, Switzerland*
16:30 – 16:50	**Sociality affects mutational spectrum of mtDNA in termites versus cockroaches** Alina A. Mikhailova[1,2], Thomas Bourguignon[2], Konstantin Gunbin[3], Konstantin Popadin[1,4] *[1]Immanuel Kant Baltic Federal University, Kaliningrad, Russia* *[2]Okinawa Institute of Science and Technology, Okinawa, Japan* *[3]Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia* *[4]Ecole Polytechnique Federale de Lausanne, Lausanne, Switzerland*
16:50 – 17:10	**Coffee break**
17:10 – 17:30	**Mitochondrial mutational spectrum in poikilothermic versus homeothermic vertebrates: effects of the temperature** Alina G. Mikhaylova[1], Victor Shamanskiy[1], Alina A. Mikhaylova[1], Kristina Ushakova[3], Konstantin Gunbin[2], Konstantin Popadin[1,4] *[1]Immanuel Kant Baltic Federal University, Kaliningrad, Russia* *[2]Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia* *[3]ITMO University, Saint Petersburg, Russia* *[4]Ecole Polytechnique Federale de Lausanne, Lausanne, Switzerland*
17:30 – 17:50	**The anatomy of mtDNA of mammalians: the links with organismal longevity** Victor Shamanskiy[1], Kristina Ushakova[1], , Konstantin Popadin[1,2], Konstantin Gunbin[3] *[1]Immanuel Kant Baltic Federal University, Kaliningrad, Russia* *[2]Ecole Polytechnique Federale de Lausanne, Lausanne, Switzerland* *[3]Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia*
17:50 – 18:10	**CryProcessor: a novel tool for mining Cry toxins in Bacillus thuringiensis sequencing data** Kirill Antonets[1,2], Anton Shikov[1,2], Yuri Malovichko[1,2], Rostislav Skitchenko[3], Anton Nizhnikov[1,2] *[1]All – Russia Research Institute for Agricultural Microbiology, St. Petersburg, Russia* *[2]Saint Petersburg State University, St. Petersburg, Russia* *[3]ITMO University, St. Petersburg, Russia*
18:10 – 18:30	**Mitochondrial genetics of amphipods: revealing mechanisms of diversity** Elena V. Romanova[1], Maria D. Logacheva[2,3], Yurij S. Bukin[1,4], Elena A. Sirotinina, Dmitry Yu. Sherbakov[1,4], Kirill V. Mikhailov[2,3], Vladimir V. Aleoshin[2,3] *[1]LIN SB RAS, Irkutsk, Russia* *[2]Moscow State University, Moscow, Russia*

[3]*IITP RAS, Moscow, Russia*
[4]*Irkutsk State University, Irkutsk, Russia*

18:30 – 18:50 **Inter – vs. intraspecific genetic variability of morphologically similar ligophores species**
Ekaterina Vodiasova[1], Alexei Ermolenko[2], Evgenija Dmitrieva[1], Dmitry Atopkin[2], Olga Shikhat[1]
[1]*IBSS RAS, Sevastopol, Russia*
[2]*FSC the East Asia Terrestrial Biodiversity, Vladivostok, Russia*

18:50 – 19:10 **Distribution of Runs Of Homozygosity (ROHs) along the human genome is shaped by recombination and purifying selection**
K. Popadin[1], E. Zezyulya[2], A. Reymond[3], D. Iliushchenko[2]
[1]*EPFL, Lausanne, Switzerland*
[2]*IKBFU, Kaliningrad, Russia*
[3]*University of Lausanne, Lausanne, Switzerland*

Poster session

Genetic diversity of the flat leeches (Hirudinea, Glossiphoniidae) in Western Siberia
Nadezhda Bolbat[1], Lyudmila Fedorova[2], Irina Kaygorodova[3]
[1]*Irkutsk State University, Irkutsk, Russia*
[2]*Surgut State University, Surgut, Russia*
[3]*Limnological institute SB RAS, Irkutsk, Russia*

Genetic aspects of internet – dependence in teenagers
Marina Smolnikova, Sergey Tereshchenko
Scientific Research Institute of Medical Problems of the North FRC KSC SB RAS, Krasnoyarsk, Russia

Application of ITS1 and ITS2 for population genetic studies of sturgeons (Acipenseridae)
Guzel Davletshina[1,2], Sergey Kliver[1], Dmitry Prokopov[1], Elena Interesova[3], Vladimir Trifonov[1,4]
[1]*IMCB SB RAS, Novosibirsk, Russia*
[2]*Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia*
[3]*TSU, Tomsk, Russia*
[4]*NSU, Novosibirsk, Russia*

Distribution of Bax protein in the rat hippocampus
Pavel Lisachev, Anna Proskura
Institute of Computational Technologies, SB RAS, Novosibirsk, Russia

Methylation and expression profiles in Apoe vicinity point to specific neighboring interaction of Apoe and TOMM40 genes: implication for The Alzheimer disease
Vladimir Babenko
Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia

EVALUATION OF Sinorhizobium meliloti GENOMIC ISLANDS INSERTED INTO THE tRNA – Thr
Mariia Vladimirova, Alexey Afonin | Viktoria Muntyan | Boris Simarov | Marina Roumiantseva
ARRIAM, Saint Petersburg, Russia

Bioinformatic basis for species formation in the bacterial genera Pectobacterium and Dickeya
Peter Evseev[1], Alexander Ignatov[2,3], Konstantin Miroshnikov[1]
[1]IBCh RAS, Moscow, Russia
[2]Research Center "PhytoEngineering" Ltd., Rogachevo, Moscow region,
[3]RUDN, Moscow, Russia

Phylostratigraphic approach in evolutionary analysis: comparison of methods
Tatiana Martusheva[1], Zakhar Mustafin[2], Sergey Lashin[1,2]
[1]Novosibirsk State University, Novosibirsk, Russia
[2]Kurchatov Genomics Center, ICG SB RAS, Novosibirsk, Russia

Novel archaeal metagenome assembled genomes from acidophilic microbial community of Parys Mountain copper mine (UK)
Aleksei Korzhenkov[1], Stepan V. Toshchakov[2], Ilya V. Kublanov[2], Peter N. Golyshin[3], | Olga V. Golyshina[3]
[1]Kurchatov genome center, NRC Kurchatov Institute, Moscow, Russia
[2]Winogradsky Institute of Microbiology FRC "Biotechnology" RAS, Moscow, Russia
[3]Bangor University, Bangor, UK

Dynamics and hypotheses of gene order shifts in mitochondrial genomes of Baikalian amphipods
Elena A. Sirotinina[1], Elena V. Romanova[1], Dmitry Yu. Sherbakov[1,2]
[1]LIN SB RAS, Irkutsk, Russia
[2]Irkutsk State University, Irkutsk, Russia

Comparative Genomic Analysis of Moderate Bacteriophages of Alfalfa Root Nodule Bacteria
Muntyan V.S.[1], Muntyan A.N.[1], Antonova E.V.[2], Kozlova A.P.[1], Dzyubenko E.A.[3], Roumiantseva M.L.[1], Afonin A.M.[1], Kabilov M.R.[4]
[1]All – Russian research institute for agricultural microbiology, Pushkin, Saint – Petersburg, Russia
[2]Institute of Plant and Animal Ecology, Ural Division of Russian Academy of Sciences,
[3]Federal Research Center N. I. Vavilov All – Russian Institute of Plant Genetic Resources (VIR) Ministry of science and higher education, Saint – Petersburg, Russia
[4]ICBFM SB RAS, Novosibirsk, Russia

Plastid genome evolution in the genus Allium

Victoria Scobeyeva[1,2], Denis Omelchenko[3], Maria Logacheva[1,4], Maxim Antipin[1], Ilya Artyushin[1], Andrey Samoilov[5], Evgenii Konorov[6], Maxim Belenikin[2], Anastasiya Krinitsina[1], Anna Speranskaya [1,5]
[1]*Lomonosov Moscow State University, Moscow, Russia*
[2]*Moscow Institute of Physics and Technology, Moscow region, Russia*
[3]*Institute for Information Transmission Problems, Moscow, Russia*
[4]*Skolkovo Institute of Science and Technology , Moscow, Russia*
[5]*Central Research Institute of Epidemiology, Moscow, Russia*
[6]*Vavilov Institute of General Genetics RAS, Moscow, Russia*

Intraspecific genetic variability of enhancers in the craniofacial tissue

Elena Minkina[1], Natalia Akberova[1], Elena Shagimardanova[1], Igor Adameyko[2,3], Oleg Gusev[1,4]
[1]*Institute of Fundamental Medicine and Biology, KFU, Kazan, Russia*
minkinaea@gmail.com
[2]*Karolinska Institutet, Stockholm, Sweden*
[3]*Medical University Vienna, Vienna, Austria*
[4]*RIKEN, Yokohama, Japan*

Analysis of sequenced chromosome – specific libraries of gekkonids sheds light to large scale genome reshuffling in reptiles

Katerina Tishakova[1,2], Dmitry Prokopov[1], Ilya Kichigin[1], Anna Molodtseva[1], Lukáš Kratochvil[3], Artem Lisachov[4], Vladimir Trifonov[1,2]
[1]*Institute of Molecular and Cellular Biology SB RAS, Novosibirsk, Russia*
[2]*Novosibirsk State University, Novosibirsk, Russia*
[3]*Charles University, Prague, Czech Republic,*
[4]*Institute of Cytology and Genetics SB RAS, Novosibirsk, Russia*

Multigene phylogenies for the earthworm *Eisenia nordenskioldi* (Lumbricidae, Annelida)

Sergei V. Shekhovtsov, Alexandra A. Shipova, Tatiana V. Polyboyarova, Sergei E. Peltek
ICG SB RAS, Novosibirsk, Russia

Genomic analyses of *Novymonas esmeraldas* and *Ca*. Pandoraea novymonadis

Alexandra Zakharova[1], Daria Tashyreva[2], Jorge Morales[3], Eva Nowack[3], Julius Lukeš[2], Vyacheslav Yurchenko[1]
[1]*University of Ostrava, Ostrava, Czech Republic*
[2]*Institute of Parasitology Biological Centre, České Budějovice, Czech Republic*
[3]*Heinrich Heine University, Düsseldorf, Germany*

Genome and Karyotype Evolution after Whole Genome Duplication in Free – Living Flatworms of the Genus *Macrostomum*

Kira Zadesenets[1], Nikita Ershov[1], Dmitry Oshchepkov[1], Eugene Berezikov[1,2], Lukas Schärer[3], Nikolay B. Rubtsov[1]
[1]*ICG SB RAS, Novosibirsk, Russia*
[2]*ERIBA, Groningen, The Netherlands*

[3]*University of Basel, Basel, Switzerland*

Comparative genomics of heat shock proteins system in extremophile nonbiting midges
Olga Kozlova | Guzel Gazizova | Elena Shagimardanova | Oleg Gusev
Kazan Federal University, Kazan, Russia

The phenotypic manifestation of Wolbachia genetic diversity in host fitness
Elena V. Burdina, Nataly Gruntenko, Petr Menshanov, Roman Bykov, | Yury Ilinsky, Inga Rauschenbach
Institute of Cytology and Genetics SB RAS, Novosibirsk, Russia

FMO superfamily protein phylogeny and the origin of YUCCA family.
Igor Turnaev, Valentin Suslov, Konstantin Gunbin, Dmitriy Afonnikov
Institute of Cytology and Genetics, ICG SB RAS, Novosibirsk, Russia

Phylogenetic Analysis of Poxviridae Genomes Using K – mer Approach
Tatyana Nepomnyashchikh, Denis Antonets, Tatyana Tregubchak, Alexander Shvalov, Elena Gavrilova, Rinat Maksyutov
SRC VB "Vector" Rospotrebnadzor, Koltsovo, Russia

Candidate SNP markers of rheumatoid arthritis changing the affinity of TATA – binding protein for the human gene promoters expo disruptive selection of immunoactivative and immunosuppressive genenets that provoke and prevent this disorder, respectively, as if it could be a self – domestication syndrome
Dmitry Rasskazov[1], Irina Chadaeva[1], Mikhail Ponomarenko[1], Ekaterina Sharypova[1], Irina Drachkova[1], Maria Nazarenko[2]
[1]*Institute of Cytology and Genetics, ICG SB RAS, Novosibirsk, Russia*
[2]*Institute of Medical Genetics, IMG TNRMC RAS, Tomsk, Russia*

Circular RNA host gene and orthologue prediction using the self – designed CircParser pipeline
Artem Nedoluzhko[1], Fedor Sharko[2], Golam Rbanni[1], Anton Teslyuk[2], Ioannis Konstantinidis[1], Jorge M.O. Fernandes[1]
[1]*Nord University, Bodø, Norway*
[2]*NRC "Kurchatov Institute", Moscow, Russia*

Hydroxymethylation changes during early embryonic development in zebrafish
Artem Nedoluzhko[1], Paula Berrutti[1], Igo Guimarães[2], Ioannis Konstantinidis[1], Igor Babiak[1], Jorge M.O. Fernandes[1]
[1]*Nord University, Bodø, Norway*
[2]*Universidade Federal de Goiás, Goias, Brazil*

OrthoWeb – web application for macro – and microevolutionary analysis of genes
Zakhar Mustafin[1], Alexey Mukhin[1], Dmitry Afonnikov[1,2], Yury Matushkin[3], Sergey Lashin[1,2]
[1]*Kurchatov Genomics Center, ICG SB RAS, Novosibirsk, Russia*
[2]*NSU, Novosibirsk, Russia*
[3]*ICG SB RAS, Novosibirsk, Russia*

Genomic Signals of Adaptation in the Northern Ural and Western Siberian Populations
Gennady Khvorykh[1], Giang Vu[2], Andrey Khrunin[1]
[1]*Institute of Molecular Genetics of the Russian Academy of Sciences, Moscow, Russia*
[2]*Moscow Polytechnic University, Moscow, Russia*

SYMPOSIUM
Animal Genetics and genomics

Oral reports

10 July, Friday

Small Conference Hall

Morning session. Animal Genetics and genomics

Chairs: *Mikhail Moshkin, Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia*
Nikolai Yudin, Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia
Vladimir Naumenko, Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia

9.00 – 9.30	**PLENARY REPORT** **Mathematical problems driven by COVID-19** *Sergey Kabanikhin* Novosibirsk State University, Novosibirsk, Russia
9:30 – 10:10	**Keynote report** **Update status of mouse resources for studies of gene function and disease at RIKEN BRC** *Atsushi Yoshiki* *RIKEN BioResource Research Center and Head of Experimental Animal Division, Tsukuba, Ibaraki, Japan*
10:10 – 10:40	**Posters show**
10:40 – 11:05	**Differentially Expressed Genes in Longitudinal Axis of the Fox's Hippocampus** *Yury Alexandrovich, Larisa Meister, Yury Herbeck* *Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia*
11:05 – 11:30	**Genetic structure of breeding pigs of Large White, bred in Russia** *Lyubov Getmantseva, S. Bakoev, O. Kostyunina, A. Traspov, Yu. Prytkov, N. Bakoev* *Federal Science Center for Animal Husbandry named after Academy Member L.K. Ernst Dubrovica, Russia*
11:30 – 11:50	**Rapidly evolving SNPs feature highly significant trait associations in GWAS SNP hotspots** *Roman Babenko, Anton Zhuravlev* *Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia*
	Lunch

Evening session. Animal Genetics and genomics

Chairs: Mikhail Moshkin, *Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia*
Nikolai Yudin, *Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia*
Vladimir Naumenko, *Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia*

14:30 – 15:00	**PLENARY REPORT** **Epidemics: challenges and responses** Alexey Romanykha *Marchuk Institute of Numerical Mathematics, Moscow, Russia*

15:00 – 15:30	**Population genetic variation of serotonin transporter gene (SLC6A4), associated with neurophysiological development** Shyamala Hande *Melaka Manipal Medical College, Manipal, India*
15:30 – 15:50	**Hippocampal Overexpression of The Cerebral Dopamine Neurotrophic Factor (CDNF) Impaired Fear Memory Formation in Rats** Tatiana Ilchibaeva, Elizaveta Zolotenkova, Dmitry Eremin, Anton Tsybko *Institute of Cytology and Genetics, SB RAS, Nobosibirsk, Russia*
15:50 – 16:10	**The First Evidences of Direct Interaction Between 5 – HT2A and TrkB receptors** Tatiana Ilchibaeva, Anton Tsybko, Vladimir Naumenko *Institute of Cytology and Genetics SB RAS, Nobosibirsk, Russia*
16:10 – 16:40	**Testing inter – relations between disturbed sleep and sterility in intra – specific hybrids of fruit fly** Lyudmila Zakharenko[1], Dmitriy Petrovskii[1], Arcady Putilov[2] *[1]Institute of Cytology and Genetics, SB RAS, Nobosibirsk, Russia* *[2]Federal Research Centre for Fundamental and Translational Medicine, Novosibirsk, Russia*
16:40 – 17:10	**Coffee break**
17:20 – 17:50	**Effects of long – term ethanol consumption in mice: interaction between BDNF and brain serotonin systems** Vladimir Naumenko, Tatiana Ilchibaeva, Egor Antonov, Darya Bazovkina, Nina Popova *Institute of Cytology and Genetics, SB RAS, Nobosibirsk, Russia*
17:50 – 18:10	**Histological evaluation of postnatal retinal development of senescence – accelerated OXYS rats** Darya Telegina[1], Anna Antonenko[2], Oyuna Kozhevnikova[1] *[1]Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia* *[2]Novosibirsk State University, Novosibirsk, Russia*
18:10 – 18:30	**Mechanisms and functions of neurogenesis in the limbic system of adult animals** Tatyana Zapara[1], Alexander Romashchenko[2], Anna Proskura[1], Alexander Ratushnyak[1], Svetlana Vechkapova[1] *[1]Institute of Computational Technologies, SB RAS, Novosibirsk, Russia* *[2]Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia*
18:30 – 18:50	**Effect of overexpression of the 5 – HT7 receptor gene on behavior and brain serotonin system in ASC mice with predisposition to depressive – like behavior** Irina Baraboshkina, Darya Bazovkina, Tatiana Ilchibaeva, Egor Antonov, Elizabeth Kulikova, Vladimir Naumenko Institute of Cytology and Genetics, SB RAS, Nobosibirsk, Russia

Poster session

Diversity and evolution of Tat LTR retrotransposon structures in non – flowering plants
Mikhail Biryukov, Kirill Ustyantsev
Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia

A platform for storage and analysis of results of genome – wide association studies of sheep
Alexander S. Zlobin[1], Anatoliy V. Kirichenko[1], Tatyana I. Shashkova[2], Natalya A. Volokova[3], Pavel M. Borodin[3], Lennart C. Karssen[4], Yakov A. Tsepilov[1], Yurii S. Aulchenko[1]
[1] Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia
[2]Novosibirsk State University, Novosibirsk, Russia
[3]L.K. Ernst Federal Science Center for Animal Husbandry, Dubrovitsy, Moscow Region, Russia
[4]PolyOmica, 's – Hertogenbosch, the Netherlands

Effect of bispidine containing monoterpenoid moieties on physical performance in mice
Anastasiya A. Kotlyarova[1], Dina V. Korchagina[2], Tatyana G. Tolstikova[2], Konstantin Yu. Ponomarev[2]
[1]Research Institute of Clinical and Experimental Lymphology – a branch of the Institute of Cytology and Genetics of Siberian Branch of Russian Academy of Sciences; [2]Novosibirsk Institute of Organic Chemistry of Siberian Branch of Russian Academy of Sciences, Novosibirsk, RUSSIA

Influence of the factors of maternal milieu on taste preferences and metabolic parameters in mouse male and female offspring
Elena Denisova[1], Elena Makarova[1], Maria Savinkova[2]
[1]Institute of Cytology and Genetics SB RAS; [2]Novosibirsk State University, Novosibirsk, RUSSIA

Genetic aspects of internet – dependence in teenagers
Marina Smolnikova, Sergey Tereshchenko
Scientific Research Institute of Medical Problems of the North FRC KSC SB RAS, Krasnoyarsk, Russia

The cross – talk molecular pathways of glutamate and leptin receptors
Anna L. Proskura, Mariya Yu. Islamova, Svetlana O. Vechkapova
Institute of Computational Technologies, SB RAS, Novosibirsk, Russia

Accumulation of oxidative hepatobiliary lesions during experimental opisthorchiasis
Oxana Zaparina[1], Anna Kovner[1], Maria Pakharukova[1,2], Viacheslav Mordvinov[1]
[1]ICG SB RAS, Novosibirsk, RF;
[2]NSU, Novosibirsk, RF

Enlarged clinical Belarusians' exomes: opportunities and restrictions of additional analysis
Aleh Liaudanski, Danat Yermakovich
IGC NAS, Minsk, Belarus

Multivariate analysis identify new loci associated with meat productivity and carcass traits in sheeps (Ovis aries)
Alexander S. Zlobin[1], Natalia A. Volkova[2], Pavel M. Borodin[2], Tatiana I. Aksenovich[2], | Yakov A. Tsepilov[3]

[1]*Kurchatov Genomic Center of IC&G, Novosibirsk, Russia*
[2]*L.K. Ernst Federal Science Center for Animal Husbandry, Dubrovitsy, Moscow Region, Russia*
[3]*Novosibirsk State University, Novosibirsk, Russia*

Study of the COI Gene Fitness for a Population – Genetic Analysis of Endemic Baikal Sponges L.Baikalensis
Alena Yakhnenko[1,2], Valeria Itskovich[1]
[1]*LIN SB RAS, Irkutsk, Russia*
[2]*JINR, Dubna, Russia*

Metabolic response of the Siberian frog Rana amurensis to anoxia
Sergei V. Shekhovtsov[1], Nina A. Bulakhova[2], Yuri P. Tsentalovich[3], Ekaterina A. Zelentsova[3], Daniil I. Berman[2]
[1]*ICG SB RAS, Novosibirsk, Russia;* [2]*IBPN FEB RAS, Magadan, Russia;* [3]*ITC SB RAS, Novosibirsk, RUSSIA*

MtDNA variability in the field vole (*Microtus agrestis* L., 1761), Arvicolinae, Rodentia) in the Urals and adjacent territories
Maria Krokhaleva, Lidia Yalkovskaya, Petr Sibiryakov, Evgenia Markova, Aleksandr Borodin
Institute of Plant and Animal Ecology, UB RAS, Ekaterinburg, Russia

Symposium "Systems biology of DNA repair processes and programmed cell death"

Oral reports

7 July, Tuesday

Computer Class

Evening session 1. Systems biology of DNA repair processes and programmed cell death

Chair: Inna Lavrik, *Otto von Guericke University, Magdeburg, Germany*

15:00 – 15:40	**Keynote report** **Ferroptosis, a metabolic death pathway** Marcus Conrad *Helmholtz Zentrum München, Neuherberg, Germany.*
15:40 – 16:20	**Keynote report** **TRAIL-resistance in melanoma: What doesn't kill you makes you move!** Dagmar Kulms *Technische Universitat Dresden, Dresden, Germany*
16:20 – 16:45	**Targeting CD95 signaling network** Inna Lavrik, [1]*Institute of Cytology and Genetics SB RAS, Novosibirsk, Russia* [2]*Translational Inflammation Research, Medical Faculty, Otto von Guericke University Magdeburg, Magdeburg, Germany*
16:45 – 17:00	**Coffee break**

17:00 – 17:25	**Computational insights into molecular mechanisms of CD95 programmed cell death activation** Nikita Ivanisenko[1], Vladimir A. Ivanisenko[1], Laura K. Hillert[2], Corinna König[2], Inna N. Lavrik[1,2] *[1]Institute of Cytology and Genetics SB RAS, Novosibirsk, Russia* *[2]Translational Inflammation Research, Medical Faculty, Otto von Guericke University Magdeburg, Magdeburg, Germany*
17:25 – 17:45	**Mitophagy promotes cell death pathways induced by lactaptin** Fabian Wohlfromm *Translational Inflammation Research, Medical Faculty,* Velichkovskii *, Magdeburg, Germany*
17:45– 18:30	***Posters show***

Oral reports

10 July, Friday

Library

Evening session 2. Systems biology of DNA repair processes and programmed cell death

Chair: *Olga Lavrik, Institute of Chemical Biology and Fundamental Medicine of SB RAS, Novosibirsk, Russia*
Dmitry Zharkov, Institute of Chemical Biology and Fundamental Medicine of SB RAS, Novosibirsk, Russia

14:30 – 15:00	**PLENARY REPORT** **Epidemics: challenges and responses** Alexey Romanykha *Marchuk Institute of Numerical Mathematics, Moscow, Russia*

15:00 – 15:30	**PARP1 activation directs RNA binding proteins to DNA damages to form PARG reversible compartments enriched in damaged DNA** Olga Lavrik[1], Maria Sukhanova[1], Anastasia Singatulina[1], Konstantin Naumenko[1],Loic Hamon[2], David Pastré[2] *[1]Institute of Chemical Biology and Fundamental Medicine SB RAS, Novosibirsk, Russia* *[2]Université Paris – Saclay, Evry, France*
15:30 – 16:00	**Human apurinic/apyrimidinic endonuclease 1 is modified by poly(ADP – ribose) polymerase 1 via the DNA structure – controlled mechanism** Nina Moor, Inna Vasil'eva, Nikita Kuznetsov, Olga Lavrik *Institute of Chemical Biology and Fundamental Medicine, SB RAS, Novosibirsk, Russia*
16:00 – 16:25	**Nucleotide Excision Repair Proteins and PARP1/PAR Interplay Regulats Protein Assembly on Damaged DNA** Nadejda Rechkunova, Maria Sukhanova, Ekaterina Maltseva, Olga Lavrik, Yuliya Krasikova *Institute of Chemical Biology and Fundamental Medicine, SB RAS, Novosibirsk, Russia*
16:25 – 16:50	**Helicase XPD Chaetomium thermophilum as a functional analogue of human XPD** Irina Petruseva[1], Natalia Lukyanchikova[1], Olga Lavrik[1], Jochen Kuper[2], Janette Kappenberger[2], Rashid Anarbaev[1], Caroline Kisker[2] *[1]Institute of Chemical Biology and Fundamental Medicine, SB RAS, Novosibirsk, Russia* *[2]Rudolf Virchow Center for Experimental Medicine, University Wurzburg, Germany*
16:50 – 17:10	**Coffee break**
17:10 – 17:50	**Actors of the base excision repair play: How well do we know the credits?** Dmitry O. Zharkov[1,2], Anton V. Endutkin[2], Evgeniia A. Diatlova[2], Anna V. Yudkina[1,2], Alexander V. Popov[2] *[1] Novosibirsk State University, Novosibirsk, Russia* *[2] Institute of Chemical Biology and Fundamental Medicine, SB RAS, Novosibirsk, Russia*
17:50 – 18:20	**Initial steps of base excision repair on DNA – substrates with non – canonical structures** Alexandra A. Kuznetsova, Olga S. Fedorova, Anastasiia T. Davletgildeeva, Nikita A. Kuznetsov *Institute of Chemical Biology and Fundamental Medicine, SB RAS, Novosibirsk, Russia*
18:20 – 18:45	**The role of DNA repair in active DNA demethylation is studed by the construct based on the CRISPR/Cas9 system** Zarina Kakhkharova, Darya Khantakova, Inga Grin *Institute of Chemical Biology and Fundamental Medicine, SB RAS, Novosibirsk, Russia*
18:45 – 19:10	**Conformational dynamics in methylated DNA repair by human Fe(II)/alpha – ketoglutarate dependent dioxygenases ALKBH2 and ALKBH3** Lyubov Yu. Kanazhevskaya[1], Denis A. Smyshlyaev [1,2], Olga S. Fedorova[1] *[1]Institute of Chemical Biology and Fundamental Medicine, SB RAS, Novosibirsk, Russia[2] Novosibirsk State University*

Activity of human AP – endonuclease APE1 on DNA – and RNA – substrates forming non – canonical structures
Anastasiia T. Davletgildeeva, Olga S. Fedorova, Alexandra A. Kuznetsova, Nikita A. Kuznetsov
Institute of Chemical Biology and Fundamental Medicine, SB RAS, Novosibirsk, Russia

The effect of protein – protein interactions on the activity of APE1 SNP forms
Olga A. Kladova, Nikita A. Kuznetsov, Irina V. Alekseeva, Olga S. Fedorova
Institute of Chemical Biology and Fundamental Medicine, SB RAS, Novosibirsk, Russia

Activity of SNP variants of human uracil – DNA glycosylases SMUG1 and MBD4
Irina V. Alekseeva, Nikita A. Kuznetsov, Artemiy S. Bakman, Olga S. Fedorova
Institute of Chemical Biology and Fundamental Medicine, SB RAS, Novosibirsk, Russia

Activity of DNA glycosylases on non – canonical DNA substrates
Evgeniia Diatlova, Dmitry Zharkov
Novosibirsk State University, Novosibirsk, Russia
Institute of Chemical Biology and Fundamental Medicine, SB RAS, Novosibirsk, Russia

Inhibition of DNA – repairing enzymes by nucleoside derivatives
Mikhail S. Drenichev[1], Alexandra L. Zakharenko[2], Nadezhda S. Dyrkheeva[2], Georgy A. Ivanov[1], Vladimir E. Oslovsky[1], Ekaterina S. Ilina[2], Irina A. Chernyshova[2], Olga I. Lavrik[2], Sergey N. Mikhailov[1]
[1] *Engelhardt Institute of Molecular Biology, Russian Academy of Sciences, Moscow, Russia*
[2] *Institute of Chemical Biology and Fundamental Medicine SB RAS, Novosibirsk, Russia*

Lesion recognition and cleavage of damage – containing G – quadruplexes by DNA glycosylases
Aleksandra A. Kuznetsova, Olga S. Fedorova, Nikita A. Kuznetsov
Institute of Chemical Biology and Fundamental Medicine, SB RAS, Novosibirsk, Russia

Nucleosome assembling: quick – time reconstitution protocol
Alexander Ukraintsev, Ekaterina Belousova, Michael Kutuzov, Svetlana Khodyreva, Tatyana Kurgina, Olga Lavrik
Institute of Chemical Biology and Fundamental Medicine, SB RAS, Novosibirsk, Russia

PARP1 activation promotes FUS translocation to cytoplasm and incorporation into stress granules
Anastasia Shavkatovna Singatulina[1], Bénédicte Desforges[2], Pastré David[2], Maria Vladislavovna Sukhanova[1], Ahmed Bouhss[2], Loic Hamon[2], Olga Ivanovana Lavrik[1]
[1]*Institute of Chemical Biology and Fundamental Medicine, SB RAS, Novosibirsk, Russia*
[2]*Université Paris – Saclay, Evry, France*

Platinum Polyoxoniobates have potential as anticancer agents
Anna V. Yudkina[1,2], Pavel A. Abramov[3,] Ivan P. Vokhtantsev[1,2], Inga R. Grin[1,2], Maxim N. Sokolov[3], Dmitry O. Zharkov[1,2]
[1]*Institute of Chemical Biology and Fundamental Medicine, SB RAS, Novosibirsk, Russia*

[2]*Novosibirsk State University, Novosibirsk, Russia*
[3]*Nikolaev Institute of Inorganic Chemistry SB RAS, Novosibirsk, Russia*

The influence of ligand structure of ruthenium nitrosyl complexes on their biological activity
Darya Khantakova[1,2], Inga Grin[1,2]
[1]*Institute of Chemical Biology and Fundamental Medicine, SB RAS, Novosibirsk, Russia*
[2]*Novosibirsk State University, Novosibirsk, Russia*

Single – nucleotide polymorphisms of hNEIL2 gene: from protein structure to functions in base excision DNA repair
Zarina Kakhkharova[1,2], Petrova Daria[1,2], Inga Grin[1,2]
[1]*Institute of Chemical Biology and Fundamental Medicine, SB RAS, Novosibirsk, Russia*
[2]*Novosibirsk State University, Novosibirsk, Russia*

The interplay between NHEJ and BER in NHEJ deficient cells
Polina Loshchenova[1,2], Svetlana Sergeeva[1,2], Grigory Dianov[1,2,3]
[1]*Institute of Chemical Biology and Fundamental Medicine SB RAS,Novosibirsk, Russia*
[2]*Novosibirsk State University*
[3]*Oxford Institute for Radiation Oncology, University of Oxford, UK*

Processing of Clustered DNA Damages by Nucleotide Excision Repair pathway
Natalia Lukianchikova, Petruseva Irina, Alexander Lomzov, Olga Lavrik
[1]*CBFM SB RAS, Novosibirsk, Russia*

YB – 1 as modulator of PARP1 activity
K.N. Naumenko, M.V. Sukhanova, E.E. Alemasova, T.A. Kurgina, M.M. Kutuzov, O.I. Lavrik
Institute of Chemical Biology and Fundamental Medicine, SB RAS, Novosibirsk, Russia

Sensitization mechanism of cells with TDP1 inhibitors to the action of topotecan
Nadezhda S. Dyrkheeva[1], IrinaV. Il'ina[2], Nikolay S. Li – Zhulanov[2], Anastasiya A. Malakhova[3], Sergey P. Medvedev [3], Suren M. Zakian[3], Konstantin P. Volcho[2], Nariman F. Salakhutdinov[2], Olga I. Lavrik[1]
[1]*Institute of Chemical Biology and Fundamental Medicine, SB RAS, Novosibirsk, Russia*
[2]*N.N. Vorozhtsov Novosibirsk Institute of Organic Chemistry, SB RAS, Novosibirsk, Russia*
[3]*Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia*

Computer-assisted analysis of caspases molecular evolution
Alexey Zamaraev[1], Gelina Kopeina[1], Boris Zhivotovsky[1,2], Konstantin Gunbin[3]
[1]*MSU, Moscow, Russia*
[2]*Karolinska Institutet, Stockholm*
[3]*Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia*

PARP1 and PARP2 affinity to the lessions in the context of nucleosomes
Tatiana Andreevna Kurgina, Rashid Oktamovich Anarbaev, Ekaterina Anatolyevna Belousova, Olga Ivanovana Lavrik, Michail Michailovich Kutusov, Svetlana Nikolaevna Khodireva
Institute of Chemical Biology and Fundamental Medicine, SB RAS, Novosibirsk, Russia

SYMPOSIUM
Cognitive Science and Genomics

Oral reports

9 July, Thursday

Library

Morning session. Cognitive Science and Genomics

Chair: Tamara Amstislavskaya, *PhBMRI, Novosibirsk, Russia*

9.00 – 9.30 **PLENARY REPORT**
Genetic Development of the Nociceptive System and the Epigenetics of the Experience of Pain
Jack M. Berger
Keck School of Medicine of USC, University of Southern California, Los Angeles, California, USA

9:30 – 10:00 **Keynote report**
ENIGMA: The Quest for Genetic Loci that Affect the Speed of Brain Development and Aging in 50,000 People from 45 Countries
Paul M. Thompson, *for the ENIGMA Consortium,*
University of Southern California, Los Angeles, CA, USA

10:00 – 10:30	**Keynote report** **Pharmacological effects of arecoline on zebrafish behavior, neurochemistry, neurophysiology and brain gene expression** Tamara Amstislavskaya[1], Nazar Serikul[2], Erik Alpyshov[2], DongMei Wang[2], JingTao Wang[2], Allan Kalueff[2,3] *[1]Institute of Physiology and Basic Medicine, Novosibirsk, Russia* *[2]School of Phar Southwest University, Chongqing, China* *[3]Institute of Translational Biomedicine, St. Petersburg State University, St. Petersburg, Russia*
10:30 – 10:50	**An approach to the analysis of cognitive systems through the evolution of simple** *Aleksander Ratushnyak, Iliya Malakhin, Tatyana Zapara* *Institute of Computational Technologies, SB RAS, Novosibirsk, Russia*
10:50 – 11:05	**Diabetes Type 2 as a Risk Factor of Neurodegeneration Development and Cognitive Impairment in db/db Mice** Tatiana Korolenko[1], Nina Dubrovina[1], Marina Ovsyukova[1], Natalya Bgatova[2], Alexander Pupyshev[1], Elena Anufrienko[1], Chih – Li Lin[3], Evgeniy Zavjalov[2] *[1]Scientific Research Institute of Physiology and Basic Medicine, Novosibirsk, Russia* *[2]Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia* *[3]Institute of Medicine, Chung Shan Medical University, Taichung, Taiwan*
11:05 – 11:20	**Expression of autophagy genes and markers of inflammation in the brain in a transgenic mouse model of Parkinson's disease** Victor M. Belichenko[1], Anna A. Akopyan[1], Maria A. Tikhonova[1], Alexandra B. Shintyapina[2], Tatiana A. Korolenko[1], Larisa A. Fedoseeva[3], Tamara G. Amstislavskaya[1] *[1]Scientific Research Institute of Physiology and Basic Medicine* *Novosibirsk, Russia* *[2]Federal Research Center for Basic and Translational Medicine* *Novosibirsk, Russia* *[3]Federal Research Center "Institute of Cytology and Genetics"* *Novosibirsk, Russia*
11:20 – 11:40	**Positive effect of joint activation of mTOR – dependent and mTOR – independent pathways of autophagy in the treatment of two experimental models of neurodegeneration** Alexander Pupyshev, Nina Dubrovina, Maria Tikhonova, Anna Akopyan, Marina Ovsyukova, Mikhail Tenditnik, Tatiana Korolenko *Institute of Physiology and Basic Medicine, Novosibirsk, Russia*
11:40 – 11:50	**Coffee break**
11:50 – 12:10	**Effects of diets rich in plant polyphenols in mouse models of neurodegenerative disorders** Maria Tikhonova[1], Tamara Amstislavskaya[1], Anna Akopyan[1], Marina Ovsyukova[1], Michael Tenditnik[1], Elena Khlestkina[2,3] *[1]Scientific Research Institute of Physiology and Basic Medicine, Novosibirsk, Russia*

[2]N.I. Vavilov All – Russian Research Institute of Plant Genetic Resources, St. Petersburg, Russia
[3]Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia

12:10 – 12:30 **Dynamic regulation of murine cortical transcriptome by early – life stress: Impairment of myelination and cognitive functions**
Natalya Bondar, Anastasia Shulyupova, Polina Kisaretova, Nikita Ershov, Elena Antontseva, Tatiana Merkulova
Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia

12:30 – 12:50 **Monoamine signaling gene networks unraveled in mouse social stress model**
Vladimir Babenko, Natalia Kudryavtseva
Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia

12:50 – 13:10 **NRG1, PIP4K2A, and HTR2C contain possible genetic biomarkers of several clinical subphenotypes of depression and bipolar disorder**
Anastasia Levchenko
Theodosius Dobzhansky Center for Genome Bioinformatics, Saint Petersburg State University, Saint Petersburg, Russia

Lunch

Evening session. Cognitive Science and Genomics

Chair: Alexander Savostyanov, *Institute of Physiology and Basic Medicine, Novosibirsk, Russia; Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia*

14.30 – 15.00 **PLENARY REPORT**
Brain Asymmetries in the Cognitive Processing
Boris M. Velichkovsky
Corresponding Member of the Russian Academy of Science, Member of Academia Europaea

15:00 – 15:20 **Electroencephalographic correlates of an insight**
Gennady Knyazev[1], Andrey Bocharov[1,2], Alexander Savostyanov[1,2]
[1]Institute of Physiology and Basic Medicine, Novosibirsk, Russia
[2]Novosibirsk National Research State University, Novosibirsk, Russia

15:20 – 15:40 **Are younger people sleepier than older people after missing bedtime and night sleep? It depends…**
Arcady Putilov, Olga Donskaya
Research Institute for Molecular Biology and Biophysics of the Federal Research Centre for Fundamental and Translational Medicine, Novosibirsk, Russia

15:40 – 16:00	**EEG correlates of strategies of emotional regulation during perception of emotional information** Andrey Bocharov *Institute of Physiology and Basic Medicine, Novosibirsk, Russia*
16:00 – 16:20	**Electroencephalographic reactions under conditions of recognition of emotional written language in people residing in different regions of Siberia** Alexander Savostyanov[1,2], Sergey Tamozhnikov[2], Natalya Milakhina[1], Darya Bazovkina[1], Alexandra Karpova[3], Natalia Borisova[3], Elena Afanaseva[3] [1]*Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia* [2]*Institute of Physiology and Basic Medicine, Novosibirsk, Russia* [3]*North – Eastern Federal University, Yakutsk, Russia*
16:20 – 16:40	**Behavioral and EEG effects of meditation on executive control functions and speech recognition** Alexander Savostyanov *Institute of Physiology and Basic Medicine, Novosibirsk, Russia* *Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia*
16:40 – 17:00	**Study of personal qualities and EEG activity in a stop signal paradigm in residents of northern regions** Tatiana Astakhova[1], Alexander Saprigyn[2], Sergey Tamozhnikov[2], Alexandra Karpova[3], Natalya Borisova[3], Elena Afanaseva[3], Alexander Savostyanov[1,2,4] [1]*Novosibirsk State University, Novosibirsk, Russia* [2]*Institute of Physiology and Basic Medicine, Novosibirsk, Russia* [3]*North – Eastern Federal University, Yakutsk, Russia* [4]*Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia*
17:00 – 17:20	**Poster Show**

Poster session

Genetic aspects of internet – dependence in teenagers
Marina Smolnikova
Research Institute for Medical Problems in the North, Krasnoyarsk, Russia

Cognitive functions and polymorphism of the BDNF gene in patients with schizophrenia and healthy individuals
Anastasiia Boiko, Ekaterina Mikhalitskaya, Elena Kornetova, Svetlana Ivanova
Mental Health Research Institute Tomsk NRMC, Tomsk, Russia

The impact of early – life stress on the expression of genes associated with the formation of the myelin sheath of neurons in the prefrontal cortex of 15 – day – old male mice.
Anastasia Shulyupova, Arina Smelova, Vasiliy Reshetnikov, Natalya Bondar

Institute of Cytology and Genetics SB RAS, Nobosibirsk, Russia

Compulsive – like behaviors in DISC1 – mice
Nadezhda Chizhova[1], Kristina Smirnova[2,3]
[1]Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia
[2]Novosibirsk State University, Novosibirsk, Russia
[3]Institute of Physiology and Basic Medicine, Novosibirsk, Russia

Altered expression of genes Npas4 and Nr1d1 in adult female mice with history of early – life stress
Yuliya Ryabushkina, Vasiliy Reshetnikov, Natalya Bondar
Institute of Cytology and Genetics, SB RAS, Novosibirsk, Russia

Associations of polymorphic variants of the genes of neurotrophic factors BDNF, NGF, NRG1 with remission in patients with depressive disorders
Natalia Vyalova, German Simutkin, Nikolay Bokhan, Svetlana Ivanova
Mental Health Research Institute of TNRMC, Tomsk, Russia

Immunoglobulins with proteolytic activity as a biomarker of impaired humoral immune system in schizophrenia
Evgeny Ermakov[1,2], Valentina Buneva[1,2], Georgy Nevinsky[1,2]
[1]ICBFM SB RAS; [2]NSU, Novosibirsk, RUSSIA

Possibilities of enhancing the neuroprotective effect of autophagy activation in the brain by stimulation of an mTOR – independent pathway of its regulation in a transgenic mouse model of Parkinson's disease
Anna Akopyan, Aleksandr Pupyshev, Maria Tikhonova
Institute of Physiology and Basic Medicine, Novosibirsk, Russia

Comparative analysis of the types of processing of visual information from the point of view of cognitive science
Alexandr Kashtnov, Mihail Pazhetnov, Elena Kashtanova
Novosibirsk State Technical University, Novosibirsk, Russia

Delta – and gamma – activity of resting state EEG as one of markers of risk of depressive disorders in migrants of subpolar and polar regions of Siberia
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Reconstruction of Dementia Gene Network Using Online Bioinformatics Tools
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Interplay between 5 – HT and BDNF system in recombinant mouse strain upon chronic fluoxetine administration
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