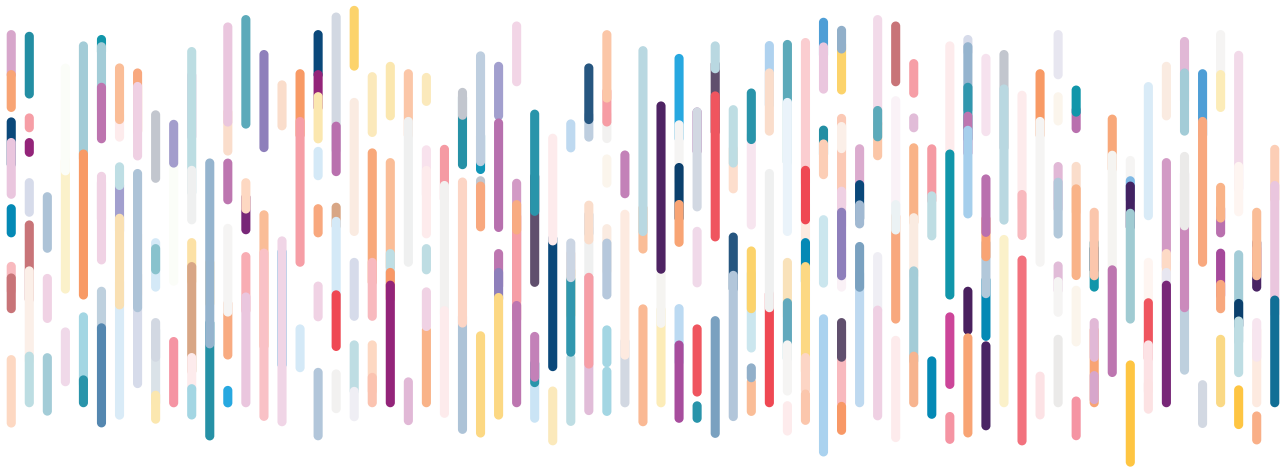
2024 Gene Forum

The 23rd Annual International

24–25 September 2024 Tartu, Estonia



UNIVERSITY OF TARTU
Institute of Genomics

Eesti Geenikeskus
Estonian Genome Foundation

Funded by
the European Union

WELCOME

It is with great pleasure that we welcome you to the 23rd International Gene Forum 2024, hosted in the vibrant city of Tartu, European Capital of Culture 2024, for an annual international high-level scientific conference on genetics and genomics. As we gather at the Estonian National Museum, we are reminded of the rich history and remarkable progress that has defined our journey in the field of genetics and genomics.

Since its inception, Gene Forum has been a cornerstone for scientific exchange and collaboration, bringing together distinguished experts from around the globe. Over the years, we welcomed more than 400 eminent speakers from 34 different countries, including Nobel Prize laureates, who have shared groundbreaking advancements and invaluable insights that have propelled their respective field forward. Our collective efforts have not only deepened our understanding of genetic mechanisms but also paved the way for innovative therapies and personalized medicine.

This year, we are excited to delve into a diverse array of topics that reflect the dynamic and interdisciplinary nature of our field. Our agenda includes discussions on the implementation of personalized medicine in clinical practice, genomics-based clinical trials, pharmacogenomics, psychiatric genomics, functional genomics, microbiome research, and evolutionary genomics. These sessions are designed to foster meaningful interactions and collaborations among researchers, clinicians, and industry leaders.

This annual gathering has become a cornerstone for the exchange of groundbreaking ideas and advancements in the field of genetics. We hope that Gene Forum 2024 will inspire new ideas, spark innovative research, and strengthen the bonds within our scientific community.

We encourage you to take full advantage of the opportunities to network with your peers, share your insights, and explore new perspectives. It is through these interactions that we can collectively push the boundaries of our knowledge and make meaningful contributions to the field.

Thank you for being a part of Gene Forum 2024!

On behalf of Gene Forum 2024 Programme Committee

Mait Metspalu
Institute of Genomics,
University of Tartu, Director of Institute of Genomics,
Professor of Evolutionary Genomics

Andres Metspalu
Institute of Genomics,
University of Tartu,
Professor of Genomics and Biobanking, Academician

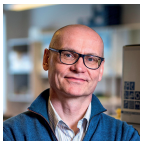
Lili Milani
Institute of Genomics,
University of Tartu,
Head of Estonian Biobank,
Professor of Epi- and Pharmacogenomics

Elin Org
Institute of Genomics,
University of Tartu, Deputy Director of Estonian Genome Centre,
Professor of Microbiomics

Kelli Lehto
Institute of Genomics,
University of Tartu,
Associate Professor of Neuropsychiatric Genetics

Michael Dannemann
Institute of Genomics, University of Tartu,
Associate Professor of Evolutionary and Population Genomics, Head of Centre for Genomics, Evolution and Medicine

Sander Pajusalu
Faculty of Medicine, University of Tartu,
Vice Dean, Associate Professor of Clinical Genetics, Tartu University Hospital, Head of the Genetics and Personalized Medicine Clinic



Pärt Peterson
University of Tartu, Faculty of Medicine,
Institute of Biomedicine and Translational Medicine,
Professor of Molecular Immunology

GENERAL INFORMATION

Organizers

University of Tartu, Insititute of Genomics

Riia 23b,
51010, Tartu, Estonia
e-mail: geneforum@ut.ee

Estonian Genome Foundation

Tiigi 61b
50410, Tartu, Estonia

Meet our organizing committee

Kaisa Lankots
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Abstract Book

An electronic abstract book of poster presentations is available at https://geneforum.ee/poster-session/

You can find more information on our invited speakers and their presentations here

Certificates of Attendance

Certificates of attendance will be made available as self-print after the conference. A link will be provided by e-mail to all participants.

Breaks

See programme for the exact time of breaks. Coffee breaks will be served at the exhibition area. Lunches will be served near the restaurant of the Estonian National Musem (turn right after exciting the conference room). You are welcome to enjoy your meal in the restaurant venue.

Networking event

The networking event of Gene Forum 2024 will take place on the 24th of September starting from 19:00 in the atrium before the museum entrance. In order to participate in the networking event, please be sure you have purchased a ticket including the additional programme.

Guided tour of museum

We offer you the opportunity to join a guided tour of the Estonian National Museum at 17:30 on the 24th of September. For further information on possible options please contact the organizers. Please notice, that the tickets for the museum/exhibition are the responsibility of the participant

Gene Forum 2024 is held as Ethical MedTech Conference Vetting System approved event

For more information visit our website www.geneforum.ee

Artur Lind Scholarship

Artur Lind

Artur Lind (1927–1989) was an Estonian molecular biologist and a pioneer in the field in Estonia. He made significant contributions researching protein biosynthesis, molecular biology methods, RNA structure, DNA sequencing, oncogenes, and ribosome function, including isolating 5S-RNA from eukaryotic ribosomes. Many of today's top Estonian scientists, such as Richard Villems and Andres Metspalu, studied and worked under him.

To honor his contributions to science, the Estonian Genome Foundation established the Artur Lind Scholarship Fund in 2001. The Institute of Genomics (UT), in collaboration with the Foundation, invited doctoral students related to biomedicine, biotechnology, genomics, molecular biology, and adjacent fields to apply for the scholarship, which will be awarded at the Gene Forum conference.

PROGRAMME

Tuesday, September 24th, 2024

8:45–9:15 REGISTRATION

9:15–9:30 OPENING OF THE CONFERENCE

Welcome by **Toomas Asser**, Rector, University of Tartu

Welcome by **Mait Metspalu**,
Director of the Institute of Genomics of the University of Tartu

9:30–10:40 MEDICAL GENOMICS IN HEALTHCARE

Moderator Andres Metspalu

Stephen Kingsmore

KEYNOTE

President and CEO of Rady Children's Institute for Genomic Medicine, United States of America

"Solving the problem of rare childhood genetic disease with genome sequencing".

Janis Klovins

Professor at the Latvian Biomedical Research and Study Centre, Latvia

"Building the Latvian Genomic Reference: Insights into Genetic Diversity and Applications of Disease Risk Prediction"

10:40–11:00 COFFEE BREAK

11:00–12:30 GENETIC EPIDEMIOLOGY

Moderator Mait Metspalu

Peter Visscher

Professor at the University of Oxford, United Kingdom and University of Queensland, Australia

"Height as a model trait in human complex trait genetics"

Zoltan Kutalik

Professor at the University of Lausanne, Switzerland and honorary senior lecturer at at the University of Exeter, United Kingdom

"Mendelian Randomisation: connecting diseases, omics layers, drugs and even humans"

Juliane Winkelmann

Professor at TUM School of Medicine and Health, Germany

"Restless Legs Syndrome insights into genetic architecture, disease biology, and risk prediction."

Tuesday, September 24th, 2024

12:30–13:30 LUNCH BREAK

13:30–15:00 PSYCHIATRIC GENOMICS

Moderator Kelli Lehto

Naomi Wray,

Professor at the University of Oxford, United Kingdom and University of Queensland, Australia

"Important opportunities for polygenic risk scores in psychiatry need in-clinic research"

Wouter Peyrot

Assistant Professor in Statistical and Psychiatric Genetics, Amsterdam University Medical Center, Netherlands

"Towards clinical implementation of genetic risk profiles using DDx-PRS"

Katherine Musliner

Associate professor at the Aarhus University and Aarhus University Hospital, Denmark

"Polygenic risk and clinical outcomes in patients with severe mental illness"

15:00–15:30 COFFEE BREAK

15:30–17:00 PHARMACOGENOMICS

Moderator Lili Milani

Andrea Gaedigk

Director at Pharmacogenetics Core Laboratory and PharmVar, professor at the Univeristy of Missouri, United States of America

"Pharmacogenetics of CYP2D6: why you should care about this gene and PharmVar"

Julia Stingl

Professor at the University Hospital of RWTH Aachen, Germany

"Precision dosing: phenotypic model based prediction of pharmacogenetic dose adjustments in situations of polypharmacy"

Thorsten Lehr

Professor of Clinical Pharmacy, Saarland University, Germany

"Decoding the Complexity of Drug-Drug-Gene Interactions: A Pathway to Safer, Personalised Treatment"

19:00– … DINNER AT ESTONIAN NATIONAL MUSEUM

PROGRAMME

Wednesday, September 25th, 2024

9:00–10:30 Microbiome

Moderator Elin Org

Tommi Vatanen
Associate professor at the University of Helsinki, Finland
"Interplay between gut bacteria, secondary metabolites and infant development"

Lars Engstrand
Professor and director at the Karolinska Institute, Sweden
"Large-scale translational microbiome research - the value of population-based metagenomic data from the perspective of personalized medicine"

Marcus Claesson
Associate Professor, University College Cork and CEO at SeqBiome, Ireland
"Disentangling the microbiome of IBD and the role of machine learning"

10:30–11:00 COFFEE BREAK

11:00–11:50 Technological advances in the forefront of science

Moderator Lili Milani

Dalia Daujotyte
Senior Director, Global Product Management at Illumina
"Illumina Protein Prep – Expand your studies across multiple omes – with NGS-based proteomics"

Neil Ward
VP and General Manager of PacBio for Europe, the Middle East, and Africa
"Comprehensive variant detection with HiFi sequencing"

11:50–12:50 LUNCH BREAK

12:50–14:20 Population genetics, Evolutionary and functional genomics

Moderator Michael Dannemann

Tuuli Lappalainen
Professor at the SciLifeLab, KTH Royal Institute of Technology, Sweden and New York Genome Center, United States of America
"Functional variation in the human genome: Lessons from the transcriptome"

Wednesday, September 25th, 2024

Kay Prüfer

Max Planck Institute, Germany

"Ancient Genomes of Neandertals and Modern Humans in Europe"

Toomas Kivisild

Professor at the KU Leuven, Belgium, associate professor at the University of Tartu, Estonia

"Impact of medieval demography and plague pandemics on the genetic make up of Northern Europe"

14:20–14:50 COFFEE BREAK

14:50–16:20 Genomics based Clinical Trials

Moderator Sander Pajusalu

Paolo Rossi

Director of the Epidemiology Unit, Azienda USL - IRCCS di Reggio Emilia, Italy

"Theory and practice of risk-based screening: insights from MyPeBS trial"

Bettina Ryll

Stockholm School of Economics Institute for Research, Sweden and Melanoma Patient Network Europe

"Building multi-stakeholder ecosystems to implement precision medicine in Europe- learnings from DRUP-Like Clinical Trials"

Chen Du

Dr, MD, Hannover Medical School, Germany

"Expediting genetic diagnosis in critically ill children by ultra-rapid genome sequencing"

16:20–… CLOSING REMARKS

Announcing the winner of Artur Lind Scholarship

POSTER OVERVIEW

No.	Title	Presenter
1	Comprehensive Benchmarking of Star Allele Calling Workflows for Pharmacogenomic Analyses	Sven van der Maas
2	The causes of economic outcomes: an examination using twins and molecular data	Alexandros Giannelis
3	Mendelian randomisation of personality and health behaviours	Kerli Ilves
4	Mapping brain-personality associations with genetic correlations reveals polylocalised brain maps	Uku Vainik
5	Assessing biases of using aDNA imputation for natural selection scans	Jose Rodrigo Flores Espinosa
6	Associations between genetic predisposition to psychiatric disorders and the severity of acute COVID-19 illness and other respiratory infections: A meta-analysis across five COVIDMENT cohorts	Kadri Kõiv
7	“Genetic investigation of self-reported cognitive symptoms in Mental Health online Survey cohort in the Estonian Biobank”	Triinu Varvas
8	Prevalence and impact of a protein-truncating POMC variant on obesity in the Estonian Biobank	Kanwal Batool
9	New insight into ovarian cancer (epi)genetic biomarkers	Ieva Vaicekauskaitė
10	Genetic and molecular mechanisms linking RSV infection to chronic lung diseases	Erik Abner
11	Shared Genetic Architecture Across Five Common Cardiovascular Diseases: Implications for Biology-Based Partitioned Polygenic Risk Scores	Tigist Demssew Adane
12	Genetic predisposition and antipsychotic treatment effect on metabolic syndrome in schizophrenia: a ten-year follow-up study using the Estonian Biobank	Maris Alver
13	Interpreting artificial neural networks to detect genome-wide association signals for complex diseases	Burak Yelmen
14	Autosomal dominant tibial muscular dystrophy in Estonia	Siiri Sarv
15	Accurate determination of clinically relevant structural variation in the CYP2D6 locus: from SNP microarrays to long-read sequencing	Maarja Jõeloo
16	R/Bioconductor data science framework for multi-omic data integration	Leo Lahti
17	Evaluating the Predictive Ability of Polygenic Risk Scores for Intrahepatic Cholestasis of Pregnancy in the Estonian Biobank	Fanny-Dhelia Pajuste
18	Effect of drug-metabolizing enzyme activity on survival in amyotrophic lateral sclerosis	Johanna Jaansoo
19	In vitro testing of genetic mutations of G protein coupled receptors	Tõnis Laasfeld
20	A history of repeated antibiotic usage leads to microbiota-dependent mucus defects.	Kertu Liis Krigul
21	Detecting embryo developmental potential by single blastomere RNA-seq	Monika Nõmm
22	Exploring drug-drug-gene interactions and the occurrence of adverse drug events based on electronic health records of Estonian Biobank participants	Laura Birgit Luitva
23	Genetic factors affecting the reporting of antidepressant side effects	Hanna Maria Kariis
24	The Predictors of Estonian Biobank Mental Health online Survey participation and the prevalence of mental health problems in the Estonian Biobank	Triinu Ojalo
25	Deciphering Suicide Risk in Major Depressive Disorder: A Polygenic Approach to Early Onset Cases	Siim Kurvits

NOTES

GOLD SPONSORS

Illumina, our mission is to improve human health by unlocking the power of the genome. Our sequencing by synthesis chemistry is used to generate high-accuracy DNA and RNA sequence data in studies around the globe. The innovative products that we provide are helping drive advancements in a multiomic understanding of cellular functions, combining transcriptomics, epigenetics, and proteomics. Multiomics profiling studies enable a more comprehensive understanding of development, cellular response, and disease, fueling the discovery of novel drug targets and biomarkers. The progress our customers have made and what lies ahead inspire us to push the boundaries of what is possible so we can create the next generation of genomics solutions.

PacBio is a premier life science technology company that is designing, developing and manufacturing advanced sequencing solutions to help scientists and clinical researchers resolve genetically complex problems. PacBio products and technology under development stem from two highly differentiated core technologies focused on accuracy, quality and completeness which include our existing HiFi long read sequencing and our SBB® short read sequencing technologies. PacBio products address solutions across a broad set of research applications including human germline sequencing, plant and animal sciences, infectious disease and microbiology, cancer genomics, and other emerging applications.

SPONSORS

BioAnalys OÜ has been in the Estonian market since 2000. The company specializes in the sales, maintenance, and repair of laboratory and medical equipment. We offer a wide range of products including medical and laboratory consumables, reagents, culture media, and glassware. Our mission is to meet the needs of healthcare and laboratory professionals. BioAnalys OÜ actively serves hospitals, scientific and research institutes, laboratories, and primary care providers. As a trusted partner and distributor, we collaborate with leading companies in the industry. The most well-known manufacturers represented by the company are Beckman Coulter Life Sciences, Copan, and LVL Technologies.

BioNordika provides the tools for your research to succeed. We distribute premium life science brands, and offer products relevant for cell & molecular biology, immunology, diagnostics, instruments, and more!

Additionally, our highly qualified product specialist team can support your projects from start to finish.

Whether you know what you're looking for or need support to solve an experimental question, you're always welcome to reach out to us. Let's talk science!

Interlux Group is an international company already for 30 years together with its subsidiaries providing innovative, top-quality technologies and solutions for Medicine, Science and Biotechnology industry to the customers of the Baltic region.

Interlux OÜ, based in Estonia, focuses on providing cutting-edge technologies and solutions across sectors like Medicine, Diagnostics and Research. Interlux ensures not only timely delivery of marketed products, but also provides customer training, application support and professional technical service.

Labochema Eesti OÜ is a leading supplier of laboratories in the Baltic countries. Our vision is to be an active partner in scientific and research work, not only by supplying products, but by providing know-how to find the most modern research methods and conduct research more efficiently. Our mission is to be a reliable partner of laboratories.

LanLab

Our mission is to provide state-of-the-art solutions that enable our customers to make the world healthier, cleaner and safer. We have been dedicated to providing quality medical and laboratory equipment for 26 years. Whether you are a startup lab or an experienced practitioner, we are here to support you every step of the way. In addition, we ensure the smooth operation of your laboratory thanks to our top-notch technical support team

Nova Natura is a local sales and service partner for instruments, reagents and consumables used in laboratories and biopharmaceutical industry processes in Estonia, Latvia and Lithuania. Our team of product, application and service specialists, experienced in different fields of life sciences, are keen to work together with local users for choosing the solutions that fit best the users needs.

Placenta.lt, based in Lithuania, is a leading provider of genetic testing and stem cell banking services in the Baltic region. We offer a comprehensive range of genetic tests, including advanced prenatal screenings, genomic profiling, cancer diagnostics, and other preventative and diagnostic tests. Our services also include the coordination and management of stem cell banking, ensuring the secure preservation of biological materials for future medical use. As the exclusive distributor of leading laboratories, Placenta.lt is committed to advancing personalized medicine by delivering high-quality and reliable solutions for healthcare professionals and individuals.

Surgitech, founded in 1998, is an Estonian company that has been the preferred supplier for medical institutions and research laboratories across the country. Our product range upholds top-quality standards and supports both clinical diagnostics and scientific research.

At Gene Forum 2024, we are excited to showcase the latest innovations to streamline your genomic workflows! Visit us at our booth to discover how our solutions can help you spend less time pipetting and more time on breakthrough discoveries!

Triolab is an expert company that sells diagnostics and bioresearch products in Finland, Estonia, Latvia, and Lithuania. Triolab provides comprehensive product and technical support for the products it represents. Triolab´s range of products consists of solutions that use modern methods for the diagnostics of genetic illnesses and susceptibility, as well as cancer mutations, pharmacogenetics and chromosome abnormalities. The range includes both rapid and user-friendly tests conducted directly from sample material, advanced next-generation sequencing (NGS) tests, Optical Genome Mapping (OGM) and quality assurance products.

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