



The European Network for Stem Cell Core Facilities



Training school – 2024

advances in reprogramming & CRISPR/Cas9

April 16th 2024



Agenda

09:00am

Registration

09:30am

Laura Battle. Welcome speech

09:40am

Tamer Önder. Chemical biology approaches to enhance human iPSC generation

10:20am

Bieke Bekeart. Can a patient-specific iPSC line model CRISPR/Cas9 based correction in the human germline?

11:00am

COFFE BREAK

11:20am

Andrea Rossi. Don't Let Bad Cells Ruin Good Science: Mastering iPSC Quality Control

12:00am

Justin McDonough. The Kolf iPS line

12:40am

Patricia Baptista. Stemgenomics. Why you should routinely test your hPSC lines

12:55am

LUNCH

02:00pm

Belén Álvarez Palomo. GMP grade hiPS cell manufacturing, characterization and banking

02:40pm

Ilyas Singec. Next-generation stem cell technologies for basic research and clinical applications

Agenda

- 03:20pm **Benjamin Gregor.** Automated tissue culture workflows for 3D live cell microscopy and the bio-banking of hiPSC lines
- 04:00pm **COFFE BREAK**
- 04:20pm **Sergii Velychko.** Highly cooperative chimeric super-SOX induces naive pluripotency across species
- 04:50pm **Adèle Kerjouan. Cytosurge.** Unlocking single-cell manipulation with FluidFM: From CRISPR cell line engineering to temporal profiling
- 05:05pm **Camille Tempier. STEMCELL Technologies.** Enhancing Genetic Stability in Human Pluripotent Stem Cells Maintained as Single Cells
- 05:20pm **Michal Bonar. NanoCollect Biomedical.** Preserving stem cells and boosting clonal outgrowth with WOLF G2 gentle sorter
- 05:35pm **Laura Batlle.** Closing session
- 05:45pm **END**
- 06:15pm **Social Activity. Boat Tour**
- 08:00pm **Conference Dinner. Xup Xup Restaurant**

Trainers

Dr. Bieke Bekaert

University of Antwerp



Dr. Bieke Bekaert obtained her Master degree of Biomedical Sciences in 2018 from Ghent University. After graduating, she began her PhD research project as a FWO (Flemish fund for scientific research) aspirant in the Ghent Fertility and Stem cell team at Ghent University. Her research focused on CRISPR/Cas9 gene editing in the mouse/human germline and human pluripotent disease stem cell models targeting genes related to infertility. Currently, she is working as a post-doctoral researcher in the Peripheral Neuropathy Research Group in UAntwerp led by Prof. Vincent Timmerman. Her main focus is to investigate Charcot-Marie-Tooth (CMT) in different human stem cell models and 3D neuromuscular organoids. Furthermore, she is involved in the creation of a humanized mouse model for demyelinating peripheral neuropathies as a platform for therapeutic testing. She is also the Junior Deputy for the ESHRE SIG group Stem Cells and is part of the Young Talent Group.

Dr. Tamer Önder

Koç University



Dr. Tamer Önder received his Bachelor's degree in Molecular Biology and Genetics from Cornell University. He then carried out PhD thesis work on cancer metastasis and cancer stem cells under the supervision of Prof. Robert Weinberg at the Whitehead Institute and the Massachusetts Institute of Technology (MIT). Subsequently, Dr. Önder was a postdoctoral research fellow in Prof. George Daley's group at the Harvard Medical School and Children's Hospital Boston where he studied somatic cell reprogramming and induced pluripotent stem (iPS) cells. His current research focuses on molecular mechanism of reprogramming and generation of patient-specific iPS cells. Research in Dr. Önder's group is supported by the EU FP7 Marie Curie CIG, EMBO, TUBA, The Newton Fund and TUBITAK.

Dr. Andrea Rossi

IUF - Leibniz Research Institute for Environmental Medicine



Dr. Andrea Rossi leads the Genome Engineering and Model Development lab (GEMD) at the IUF - Leibniz Research Institute for Environmental Medicine in Düsseldorf, Germany. His research focuses on utilizing iPSC-derived organoids and genome engineering to model human diseases and explore genetic compensation mechanisms. The lab is dedicated to creating accessible tools for smaller laboratories to engage in stem cell work, genome engineering and sequencing without requiring expensive equipment or extensive bioinformatics expertise. Dr. Rossi earned his PhD in Biochemistry and Molecular Biology from the University of Bari. As a post-doctoral fellow, he joined Alan Verkman's lab at the University of California, San Francisco, delving into human diseases and developing an interest in genetic compensation. Later, Dr. Rossi continued his research at Didier Stainier's lab at the Max Planck Institute for Heart and Lung Research (MPI-HLR) in Bad Nauheim, where he contributed to the discovery of a novel genetic compensation mechanism termed transcriptional adaptation. He also serves on the editorial board of Stem Cell Research (Elsevier).

Dr. Justin McDonough

The Jackson Laboratory



Justin McDonough earned his Ph.D. in Microbiology and Immunology at UNC-Chapel Hill, where he utilized bacterial genetic engineering strategies to characterize protein translocation pathways in Mycobacterium tuberculosis and identify secreted factors that contribute to TB pathogenesis. During his postdoctoral work with Dr. Craig Roy at Yale University, Justin further probed the host-pathogen interface, focusing on the human cell requirements for infection with Coxiella burnetii using genome-wide RNA interference screening and CRISPR knockout strategies. Justin joined JAX in 2017 and was trained by Dr. Bill Skarnes in human stem cell engineering. He is currently the Associate Director of the Cellular Engineering service. He specializes in precision genome editing of human induced pluripotent stem cells and leads a core facility providing custom-engineered models for JAX researchers. The service lab staff is composed of nine total scientists - three scientists serving JAX investigators and carrying out roughly 90 genome editing requests per year and six scientists funded by the iPSC Neurodegenerative Disease Initiative (iNDI), which is the largest ever iPSC genome engineering project.

Trainers

Dr. Ilyas Singec

FUJIFILM Cellular Dynamics



Dr. Ilyas Singec is currently the Chief Scientific Officer of FUJIFILM Cellular Dynamics, a global developer and manufacturer of human cells derived from induced pluripotent stem cells (iPSCs). Prior to this role, he served as the inaugural director of the Stem Cell Translation Laboratory (SCTL) at the National Institutes of Health (NIH). The SCTL was funded by the NIH Common Fund (Office of the NIH Director) with the mission to help advance the iPSC technology into clinical applications and drug discovery by developing innovative foundational technologies that can be broadly utilized. At NIH, he introduced novel methods for iPSC culture, single-cell cloning, and genome editing. He also pioneered industrial-scale robotic cell culture and the development of advanced cell differentiation protocols. Prior to this role, Dr. Singec held leadership positions at Pfizer and the Sanford-Burnham-Prebys Medical Discovery Institute focusing on cell reprogramming and genetics-based target identification and validation for neurological and psychiatric disorders. Dr. Singec received his MD and doctoral degree (summa cum laude) from the Universities of Bonn and Freiburg (Germany) and completed training in anatomy and clinical neuropathology.

Dr. Sergiy Velychko

Harvard Medical School



Dr. Sergiy Velychko is a Postdoctoral Researcher in Prof. George Church's lab at Harvard Medical School's Department of Genetics, focusing on synthetic developmental biology. A Ukrainian native, Sergiy's educational path began at Kyiv National University in Biology and Biotechnology. He then earned his Master's in Molecular Bioengineering from the Technical University of Dresden, Germany, under Prof. Konstantinos Anastasiadis, concentrating on genetic engineering of stem cells. At the Max Planck Institute for Molecular Biomedicine in Münster, Germany, he worked under supervision of Prof. Hans Schöler, exploring pluripotency and cell fate reprogramming, and graduated with Summa Cum Laude. Sergiy's work, which includes co-authoring 14 peer-reviewed papers and holding a patent, has been recognized with several awards, such as the "Best Publication of the Year Award" from the German Stem Cell Network for his cover article in Cell Stem Cell. His recent contributions include the development of an enhanced Yamanaka factor cocktail and elucidating the mechanism behind naïve pluripotency in mammals.

Benjamin Gregor

Allen Institute



Benjamin Gregor started at the Allen Institute for Cell Science in 2015 to develop the automated tissue culture platform used by the Microscopy Team's pipeline to generate consistent imaging plates of cell colonies for high magnification microscopy. Ben joined the Allen Institute for Brain Science in 2008, starting in the Atlas lab, working with a great team and Tecan liquid handling platforms to complete the Institute brain atlas. After the Atlas completion, Ben moved on to the In Vitro Human cell types team building on his laboratory automation experience by working on the development of an automated differentiation platform before moving to Cell Science. Ben earned his B.S. in Biology from San Francisco State University.

Dr. Belén Alvarez Palomo

Banc de Sang i Teixits



Dr. Belén Alvarez Palomo is PhD in Biochemistry by the University of Barcelona. She was a postdoctoral researcher at The Netherlands Cancer Institute (Amsterdam) and Institut Municipal d'Investigació Mèdica (Barcelona), working in the field of cancer. She later engaged in the field of regenerative medicine and stem cells at the Faculty of Medicine of the University of Barcelona and Banc de Sang i Teixits. She has also been a visiting professor for Universitat Pompeu Fabra (2007-2008). Currently she leads the iPS and Advanced Therapies group at BST, focused in the development of clinical grade processes to produce effector cells for immunotherapies.

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This publication is based upon work from COST Action CorEuStem, CA20140, supported by COST (European Cooperation in Science and Technology).

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