3rd International Annual Conference

of the German Stem Cell Network (GSCN)
9 – 11 September 2015

Campus Riedberg, Otto Stern Center
Goethe University
Frankfurt/Main

Organizer:
German Stem Cell Network (GSCN)
c/o Max Delbrück Center (MDC)
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Program

WEDNESDAY, 9 September

11:00 – 12:00  Registration and light lunch

OSZ 1: Opening
12:00 – 12:15  Welcome to the Goethe University, Otto Stern Center
Enrico Schleiff, Vice President, Goethe University
12:15 – 12:30  Opening
Thomas Braun (Acting President, GSCN)
12:30 – 13:15  Keynote lecture I
K1 – Epigenetic reactivation of adult epicardium underpins endogenous heart repair
Paul Riley, University of Oxford, U.K. (Chair: Thomas Braun)
13:15 – 14:00  Keynote lecture II
K2 – Modeling human lung development and disease using pluripotent stem cells
Hans-Willem Snoeck, Columbia University, New York, U.S.A. (Chair: Ulrich Martin)
14:00 – 14:30  Coffee break/Industry exhibition

Concurrent scientific working group session I

OSZ 3: Stem cells in regenerative therapies I (Chairs: Michael Cross/Ulrich Martin)
14:30 – 14:45  Overview
Michael Cross, University of Leipzig
14:45 – 15:00  T01 – Atrial & ventricular stem cells from same heart show different functional
competencies for cardiac repair but are superior to endothelial progenitors
Parul Dixit, University of Otago, Dunedin, New Zealand
15:00 – 15:15  T02 – Cardiomyogenesis of human pluripotent stem cells is associated with
transformation of metabolism and expression of specific PDLIM5 splice variants
Sarah A. Konze, Hannover Medical School
15:15 – 15:30  T03 – Gene modification in stem cells targeting megakaryopoiesis
Lisette Johanna Latorre Rey, Paul Ehrlich Institute, Langen
15:30 – 15:45  T04 – A novel cell surface marker for the enrichment of transplantable dopaminergic
precursor cells from differentiated human pluripotent stem cells
Andreas Bosio, Miltenyi Biotec GmbH, Bergisch Gladbach
15:45 – 16:00  Working group discussion “Stem cells in regenerative therapies”

OSZ 4: Pluripotency and embryonic stem cells (Chairs: Hans Schöler/Mathias Treier)
14:30 – 14:45  Overview
Hans Schöler, Max Planck Institute for Molecular Biomedicine, Münster
14:45 – 15:00  T05 – Foxd3 promotes the exit from naive pluripotency and prevents germline
specification through enhancer decommissioning
Alvaro Rada-Iglesias, CMMC, University of Cologne
15:00 – 15:15  T06 – Ground state conditions induce rapid reorganization of core pluripotency factor binding before global epigenetic reprogramming
Christina Galonska, Havard University, Cambridge, U.S.A.

15:15 – 15:30  T07 – TDP-43 safeguards pluripotency by regulation of alternative polyadenylation
Miha Modic, Helmholtz Center Munich and MRC LMB Cambridge, U.K.

15:30 – 15:45  T08 – LncRNA Panct1 maintains mouse embryonic stem cell identity by recruiting TOBF1 to OCT-SOX sequences in early G1
Debojyoti Chakraborty, Dresden University of Technology

15:45 – 16:00  T09 – Decoding the heterogeneity of pluripotent stem cells at the single cell level
Simon Hastreiter, ETH Zürich BSSE, Basel, Switzerland

OSZ 6: Computational stem cell biology (Chairs: Georg Füllen/Ingo Röder)
14:30 – 14:45  Overview
Georg Füllen, IBIMA, University of Rostock

14:45 – 15:00  T10 – Morpheus: computational modeling for stem cell biologists
Walter de Back, Dresden University of Technology

15:00 – 15:15  T11 – Inference of spatiotemporal effects on cellular state transitions from time-lapse microscopy
Michael Strasser, Helmholtz Center Munich

15:15 – 15:30  T12 – Prospective identification of hematopoietic lineage choice
Carsten Marr, Helmholtz Center Munich

15:30 – 15:45  T13 – On the quantification of hematopoietic tissue remodeling in aging and disease: simulations, measures and predictions
Christoph Baldow, Dresden University of Technology

15:45 – 16:00  Working group discussion “Computational stem cell biology”

16:00 – 16:30  Coffee break/Industry exhibition

16:30 – 18:30  Poster session I: P001 – P074
P001 – P024: Hematopoietic stem cells
P025 – P038: Stem cells in regenerative therapies
P039 – P048: Stem cells in regenerative therapies II: Mesenchymal stem/stroma cells
P049 – P074: Stem cells in disease modeling and drug development

Even numbers: please present you poster from 16:30 – 17:30
Odd numbers: 17:30 – 18:30

18:30 – 21:00  Get-together for all participants
Dinner buffet in the foyer and outside of the Otto Stern Center
THURSDAY, 10 September

Concurrent scientific working group session II

OSZ 3: Stem cells in disease modeling and drug development (Chairs: Karl-Ludwig Laugwitz/Oliver Brüstle)
09:00 – 09:15 Overview
Karl-Ludwig Laugwitz, Technische Universität München
09:15 – 09:30 T14 – Infection, innate immune signaling and cancer in the stomach – stem cell-derived organoids as a new model
Sina Bartfeld, Hubrecht Institute, Utrecht, Netherlands
09:30 – 09:45 T15 – Modeling reactive gliosis in mESC-derived retina organoids
Manuela Völker, DZNE Dresden
09:45 – 10:00 T16 – Patient iPSC-derived NPCs as a model for mtDNA mutations reveal HCS/HTS-suitable phenotypes
Raul Bukowiecki, Max Delbrück Center, Berlin
10:00 – 10:15 T17 – Intracellular calcium-release and autophagy modulation trigger ataxin-3 positive nuclear inclusions in Machado-Joseph disease-specific neurons
Johannes Jungverdorben, Institute of Reconstructive Neurobiology, Bonn
10:15 – 10:30 Working group discussion “Stem cells in disease modeling and drug development”

OSZ 4: Stem cells in disease: cancer stem cells (Chairs: Thomas Brabletz/Andreas Trumpp)
09:00 – 09:15 Overview
Thomas Brabletz, FAU Erlangen
09:15 – 09:30 T18 – Epigenetic age-predictions in cancer: aging signatures are associated with malignant transformation and clinical prognosis
Wolfgang Wagner, RWTH Aachen Medical School
09:30 – 09:45 T19 – Triple-negative inflammatory breast cancer: syndecan-1 is a biomarker and regulator of cancer stem cell phenotype via IL-6/STAT-3 and Notch-3
Sherif A. Ibrahim, Faculty of Science, Cairo University, Egypt
09:45 – 10:00 T20 – Targeting tumor-initiating stem cells in colorectal carcinoma
Ilaria Lunger, Goethe University Hospital and LOEWE Center Frankfurt
10:00 – 10:15 T21 – Unraveling the subclonal architecture of adult B-ALL at a single cell level
Bartosch Wojcik, Goethe University Hospital and LOEWE Center Frankfurt
10:15 – 10:30 Working group discussion “Stem cells in disease: cancer stem cells”

OSZ 6: Stem cells in development (Chairs: Jan Lohmann/Thomas Braun)
09:00 – 09:15 Overview
Jan Lohmann, Centre for Organismal Studies (COS) Heidelberg
09:15 – 09:30 T22 – Understanding the curious case of trophoblast differentiation
Micha Drukker, Helmholtz Center Munich
09:30 – 09:45 T23 – The Ca²⁺-regulated phosphatase calcineurin controls proportional growth of zebrafish regenerating fins
Christopher Antos, DFG-Center for Regenerative Therapies / TU Dresden
09:45 – 10:00  T24 – Antagonistic roles of miR-181a and orphan nuclear receptor GCNF in regulating human neural stem cell maintenance
Laura Stappert, Institute of Reconstructive Neurobiology, Bonn

10:00 – 10:15  T25 – Direct Nkx2-5 transcriptional repression of Isl1 controls cardiomyocyte subtype identity
Jessica Haas, Klinikum r.d.l. der TUM, Munich

10:15 – 10:30  T26 – Hypoxia induced epigenetic mechanism underlying Isl1+ cardiac progenitor cell homeostasis control
Xuejun Yuan, Max Planck Institute for Heart and Lung Research, Bad Nauheim

10:30 – 11:00  Coffee break/Industry exhibition

Industry session: “Technologies from GSCN industry partners”

**OSZ 3:** Main supporter (chair: Albrecht Müller)
11:00 – 11:05  Introduction
11:05 – 11:35  C1 – Robust expansion of human pluripotent stem cells: integration of bioprocess design with transcriptomic and metabolomic characterization
Margarida Serra, Instituto de Tecnologia Química e Biológica (ITQB), Universidade Nova de Lisboa (UNL), Oeiras, Portugal, representing Eppendorf AG

11:35 – 12:05  C2 – A human iPS cell platform to study pancreatic disease
Alexander Kleger, University Hospital Ulm, representing PeproTech GmbH

12:05 – 12:35  C3 – Advances in pluripotent stem cell culture and differentiation
David Kuninger, Thermo Fisher Scientific – LSG

**OSZ 4:** Supporter (chair: Hartmut Geiger)
11:00 – 11:05  Introduction
11:05 – 11:35  C4 – Consistency of pluripotent stem cell culture systems and differentiation protocols for generation of functional human stem cell derived hepatocytes
Mia Emgård, Takara Clontech

11:35 – 12:05  C5 – Reprogramming of somatic cells to induced pluripotent stem cells using a novel synthetic self-replicating RNA vector in a feeder-free system
Alexandra Blak, STEMCELL Technologies SARL

12:05 – 12:35  C6 – High throughput electrospinning to generate scaffolds containing cells for regenerative medicine applications
Thomas Hayes, BioInicia S.L./I&L Biosystems GmbH

**OSZ 6:** Supporter (chair: Ana Martin-Villalba)
11:00 – 11:05  Introduction
11:05 – 11:35  C7 – An optimal serum-free, xeno-free culture system for the isolation, expansion and differentiation of clinical grade human mesenchymal stem cells
Orit Ecker-Cohen, Biological Industries / Biofroxx GmbH

11:35 – 12:05  C8 – Explore what makes every stem cell unique from inside out
Mark Lynch, Fluidigm Europe B.V.
12:05 – 12:35 C9 – GrowDex® hydrogel for 3D cell cultures
Lauri Paasonen, UPM-Kymmene Corporation

12:35 – 14:00 Lunch buffet/Industry exhibition/Poster viewing supported by STEMCELL Technologies SARL

Seminar room 3 (1st floor)
12:50 – 13:50 Showcase: Outreach + Patient Information (Chairs: Ira Herrmann/Tobias Cantz)

OSZ 1: Presidential Symposium
14:00 – 14:30 PS1 – Evolving stem cell-based strategies for targeting neurological disorders
Oliver Brüstle, Institute of Reconstructive Neurobiology, Bonn

14:30 – 15:00 Young Investigator Award
PS2 – In vitro cell culture models to decipher brain development and neuronal integration
Julia Ladewig, Institute of Reconstructive Neurobiology, Bonn

15:00 – 15:30 Female Scientist Award
PS3 – From neurogenesis to neural repair
Magdalena Götz, Helmholtz Center Munich

15:30 – 16:00 Publication of the Year 2015 Award (07/14 – 06/15)
PS4 – Primate-specific endogenous retrovirus-driven transcription defines naive-like stem cells
Jichang Wang (w. Zsuzsanna Izsvak), Max Delbrück Center, Berlin

16:00 – 16:30 Coffee break/Industry exhibition

16:30 – 18:30 Poster session II: P074 – P147 supported by Fluidigm Europe B.V.
P075 – P093: Pluripotency and embryonic stem cells
P094 – P107: Programing and reprograming
P108 – P113: Somatic stem cells
P114 – P130: Stem cells in development
P131 – P143: Stem cells in disease: Cancer stem cells
P144 – P147: Computational stem cell biology

Even numbers: please present you poster from 16:30 – 17:30
Odd numbers: 17:30 – 18:30

18:30 – 19:30 Membership meeting

19:30 – 20:00 Bus transfer

20:00 – 01:00 GSCN Networking evening for all participants
with dinner buffet and DJ at the Banquet Hall I, Casino, Campus Westend
FRIDAY, 11 September

Concurrent scientific working group session III

**OSZ 3: Hematopoietic stem cells** (Chairs: Timm Schröder/Claudia Waskow)
09:00 – 09:15  Overview  
Timm Schröder, ETH Zürich BSSE, Basel, Switzerland
09:15 – 09:30  T27 – CCND1/CDK4-mediated cell cycle progression provides a competitive advantage for human hematopoietic stem and progenitor cells in vivo  
Nicole Mende, Dresden University of Technology
09:30 – 09:45  T28 – The H3K4 histone methyltransferase Setd1b is required for haematopoietic stem cell homeostasis in mice  
Kerstin Schmidt, Biotechnology Center TU Dresden
09:45 – 10:00  T29 – Molecular and functional heterogeneity of dormant HSCs  
Nina Cabezas-Wallscheid, German Cancer Research Center (DKFZ) Heidelberg
10:00 – 10:15  T30 – High efficiency gene correction in hematopoietic cells by template-free CRISPR/Cas9 genome editing  
Frank Schnütgen, University Hospital Frankfurt

**OSZ 4: Somatic stem cells** (Chairs: Ana Martin-Villalba/Michael Rieger)
09:00 – 09:15  Overview  
Ana Martin-Villalba, German Cancer Research Center (DKFZ) Heidelberg
09:15 – 09:30  T31 – Visualization of the short-range Wnt gradient in the intestinal stem cell niche  
Henner Farin, Georg-Speyer-Haus, Frankfurt
09:30 – 09:45  T32 – Clonal heterogeneity within the exocrine pancreas  
Damian Wollny, German Cancer Research Center (DKFZ) Heidelberg
09:45 – 10:00  T33 – Single cell analysis of cellular mechanisms regulating adult neural stem cell fate  
Onur Basak, Hubrecht Institute, Utrecht, Netherlands
10:00 – 10:15  T34 – In vivo Ribotag analysis reveals translational control during neural stem cell differentiation  
Avni Baser, German Cancer Research Center (DKFZ) Heidelberg
10:15 – 10:30  Working group discussion “Basic, translational and applied hematopoiesis”

**OSZ 5: Stem cells in reg. therapies II: Mesenchymal stem/stroma cells** (Chairs: Dirk Strunk/Karen Bieback)
09:00 – 09:15  Overview  
Dirk Strunk, Paracelsus Medical University, Salzburg, Austria
09:15 – 09:30  T35 – The transcription factor GATA2 controls mesenchymal stem cell fate  
Alexander Tolkachov, Center for Cardiovascular Research, Charité, Berlin
09:30 – 09:45  T36 – Attenuation of alloimmunity to human endothelial colony forming cells (ECFC) by interaction with mesenchymal stem/progenitor cells (MSPC)  
Naima Souidi, Berlin-Brandenburg Center for Regenerative Medicine and Institute of Medical Immunology, Charité, Berlin
09:45 – 10:00  T37 – Murine bone marrow derived mesenchymal stem cells as a putative therapy approach for influenza-virus induced pneumonia  
Lina Jankauskaite, Universities of Giessen and Marburg Lung Center (UGMLC), Giessen
10:00 – 10:15 T38 – Regenerative potential of human pluripotent stem cell-derived MSCs in a Gunn rat liver injury model
Lucas-Sebastian Spitzhorn, University Hospital of Düsseldorf

10:15 – 10:30 Working group discussion “Stem cells in regenerative therapies” – future progress with MSCs

**OSZ 6: Programing and reprogramming** (Chairs: Micha Drukker/Frank Edenhofer)

09:00 – 09:15 Overview
Micha Drukker, Helmholtz Center Munich

09:15 – 09:30 T39 – An inducible overexpression system for rapid and highly efficient induction of mature cell types from human pluripotent stem cells
Matthias Pawlowski, Cambridge Stem Cell Institute, U.K.

09:30 – 09:45 T40 – Reprogramming triggers endogenous LINE-1, Alu and SVA retrotransposition in human induced pluripotent stem cells affecting host gene expression
Gerald Schumann, Paul Ehrlich Institute, Langen

09:45 – 10:00 T41 – Efficient patterning of human pluripotent stem cells towards distinct mesendodermal subtypes simply by modulation of the bulk cell density
Henning Kempf, Hannover Medical School

10:00 – 10:15 T42 – Direct *in vivo* glia-to-neuron conversion in the postnatal mouse cerebral cortex
Sophie Péron, Institute of Physiological Chemistry, Johannes Gutenberg University Mainz

10:15 – 10:30 Working group discussion “Pluripotency and reprogramming”

10:30 – 11:00 Coffee break/Industry exhibition

**Concurrent strategic working group session**

**OSZ 3: Stem cell technologies** (Chairs: Frank Emmrich/Andreas Bosio)

11:00 – 11:30 S1 – Technologies in genetic engineering of stem cells
Ulrich Martin, Hannover Medical School

11:30 – 12:00 S2 – Genetic engineering of human pluripotent stem cells using TALENs nucleases
Sebastian Diecke, Max Delbrück Center, Berlin

12:00 – 12:30 S3 – Mammalian genome engineering in the era of CRISPR/Cas
Ralf Kühn, Max Delbrück Center, Berlin

**OSZ 4: Career development** (Chairs: Insa Schröder/Hartmut Geiger)

11:00 – 11:15 Introduction
Insa Schröder, GSI Helmholtzzentrum für Schwerionenforschung GmbH, Darmstadt

11:15 – 12:00 S4 – How to apply in research and industry
Hanna Proner, academics/Die Zeit, Hamburg

12:00 – 12:30 Panel discussion

**OSZ 6: Clinical trials and regulatory affairs** (Chairs: Andreas Kurtz/Halvard Bönig)

11:00 – 11:05 Introduction
Andreas Kurtz, Berlin-Brandenburg Center for Regenerative Medicine, Charité, Berlin

11:05 – 11:25 S5 – Regulatory aspects and classifications of stem cell based medicinal products
Egbert Flory, Paul Ehrlich Institute, Langen
11:25 – 11:45  S6 – Accelerating the clinical development of cell based therapies

11:45 – 12:00  S7 – The ADIPOA-1/-2 trial – Adipose tissue derived stromal cells for osteoarthritis therapy
*Oliver Pullig*, Fraunhofer IGB, Würzburg branch

12:00 – 12:15  S8 – Cell Therapy for bone defects: *in vitro*, *in vivo*, and first clinical results
*Ingo Marzi*, Goethe University Hospital, Frankfurt

12:30 – 14:00  Lunch buffet/Industry exhibition/Poster viewing
supported by UPM-Kymmene Corporation

12:45 – 13:45  Meet the expert tables: Stem cell technologies
Please register at the registration (limited to 10 participants each)
Seminar room 3: CRISPR/Cas Technology *(Ralf Kühn)*
Seminar room 4: TALENs Technology *(Sebastian Diecke)*

12:45 – 13:45  Drop-in booth on regulatory affairs and clinical trials with *Egbert Flory*,
*Natalie Mount*, u.a. (Registration)

**OSZ 1: Joined Session with LOEWE Center for Cell and Gene Therapy Frankfurt (CGT)**

14:00 – 14:45  **Keynote lecture III**
K3 – Pluripotency in the artificial cell space
*Andras Nagy*, Lunenfeld-Tanenbaum Research Institute, Toronto, Canada
(Chair: *Harald von Melchner*)

14:45 – 15:30  **Keynote lecture IV**
K4 – Modeling and treating neural disease using human pluripotent stem cells
*Lorenz Studer*, Memorial Sloan Kettering Cancer Center, New York (Chair: *Lenhard Rudolph*)

15:30 – 16:00  Coffee break/Industry exhibition

**CGT Session** (Chair: *Lenhard Rudolph*)

16:00 – 16:20  CGT1 – Regulation of second heart field progenitor cells: discovering key molecular players
*Gergana Dobreva*, Max Planck Institute for Heart and Lung Research, Bad Nauheim

16:20 – 16:40  CGT2 – Functional systems analysis of the adult muscle stem cell identifies crucial regulators of muscle regeneration
*Johnny Kim*, Max Planck Institute for Heart and Lung Research, Bad Nauheim

16:40 – 17:00  CGT3 – Hematopoietic stem cell fate decision control at single cell resolution
*Michael Rieger*, Goethe University Hospital and LOEWE Center Frankfurt

17:00 – 17:20  CGT4 – The Sleeping Beauty transposon system for genetic engineering in stem cells
*Zoltán Ivics*, Paul Ehrlich Institute, Langen

**Closing ceremony**

17:30 – 17:45  Poster award ceremony and announcement of industry quiz winners (*Daniel Besser; GSCN*)
17:45 – 18:00  Outlook and closing remarks
Incoming president: *Ulrich Martin*

**End of GSCN conference**

**Announcement** (please inform the registration desk for transfer)

19:00 – 21:00  GSCN public event: Moderne Zelltherapien – mit Stammzellen gegen Herzinfarkt und Blutkrebs (in German, page 9)