



Spring school in regenerative medicine 2007 Oslo, Norway

Cell signalling and artificial differentiation in
regenerative medicine
Lecture Week: May 14th – May 16th, 2007



Practical Course: “Culture and Transplantation
of Neural Stem Cells”
May 18th – May 22nd, 2007



Department of Neurology,
University of Rostock



Norwegian
Center for
Stemcell Research

UNIVERSITETET
I OSLO

CENTRE FOR
MOLECULAR BIOLOGY
AND NEUROSCIENCE

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NordForsk and the Norwegian stem cell network

Regenerative medicine is the new frontier in medicine, unlocking the secrets of how the body generates itself. Recently, William Haseltine, chairman and CEO of Human Genome Sciences in Rockville, Maryland, told the New York Times, "When we know, in effect, what our cells know, health care will be revolutionised, giving birth to regenerative medicine - ultimately including the prolongation of life by regenerating our aging bodies with younger cells." This is why stem cell research is so important: it is not merely a small step along a continuum of medical technology development, but a fundamental change in the paradigm of medicine. Stem cells, especially adult stem cells are tools that the body uses to enable self-assembly.

But, interest in stem cells derives also from their ability to multiply as undifferentiated cells in culture, to be stored in bio banks, and to form defined cell types. Stem cells thereby become a potential source of other, more specialised cells, which upon proper delivery might replace diseased or damaged cells, when cell loss exceeds the body's own abilities to repair. Stem cells used in **cell replacement therapy** do accordingly have the potential to cure severe and disabling diseases like Parkinson's, Chorea Huntington, stroke etc.

The EU Spring School on regenerative medicine offers the opportunity to meet, listen, discuss and interact with the most prominent scientists in the field of stem cell biology and medicine. The topics will cover the basic cellular biology of stem cells as well as potential applications in regenerative medicine.

Welcome to Oslo for the Spring School 2007. We hope that the meeting will fulfil its goals and your expectations.

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14th – 16th of May

Practical Course: "Culture and Transplantation of
Neural Stem Cells"
18th – 22nd of May

Organization committee

Chris Mason (London)
Ernest Arenas (Stockholm)
Mahendra Rao (Invitrogen)
Arndt Rolfs (Rostock)
Carla Biedermann (Rostock)
Stefan Krauss (Oslo)



Monday, May 14th

The Stem Cell Challenge

Joint symposium of the EU spring school in regenerative medicine, the Norwegian stem cell centre and the Norwegian biotechnology advisory board

Place: Gamle Logen, Grev Wedels plass 2 - 0151 Oslo
www.logen.no

- 09:00 - 09:30 **Registration**
- 09:30 - 09:40 **Opening**
Stefan Krauss (Oslo) Head of Norwegian stem cell centre/CAST biomedical innovation centre
Arndt Rolfs (Rostock) Head Marie Curie programme on regenerative medicine
- 09:40 - 10:20 **Welcome Addresses**
Øystein K. Djupedal, Minister of Education and Research, Norwegian Government
Wegard Harsvik, State Secretary, Ministry of Health and Care Services
Mariana Resnicoff, EUROCORES Programme Coordinator
Arvid Hallen, Head, Research Council of Norway
Haakon Benestad, Prorector, University of Oslo
- Session I** **Stem cells: The basics**
Chairman: Stefan Krauss, Head of Norwegian stem cell centre/CAST biomedical innovation centre
- 10:20 - 10:50 **Stem cells and regenerative medicine – what can we expect from the next 10 years: Stem cell + Regenerative medicine translation**
Chris Mason, University College London, United Kingdom
- 10:50 – 11.20 **Stem cells and Parkinson’s disease: Hopes and threats**
Ernest Arenas, Karolinska Institute, Stockholm, Sweden
- 11:20 – 11.50 **Industry perspective**
Mahendra Rao, Invitrogen, Baltimore, USA
- 11:50 - 12:20 **Panel discussion**
Leif Arild Fjellheim, Head of The Norwegian National Spinal Cord Injury Association
Hilde Steineger, Senior Associate, NeoMed
Iver Langmoen, Professor, Ullevål University Hospital
- 12:20 – 13:10 Lunch break

- 13:10 – 13:25 **Stringquartet “Charmina”**
Aja Humm, 1. Violin, Camilla Kjøll, 2. Violin,
Maria Syre Mjølhus, Viola, Kjersti Rydsaa, Chello
- "Stærjentens søndag" by Ole Bull
 - Brandenburgkonsert nr. 3 in G-major "Allegro" by J. S. Bach
 - Divertimento in F-major "Andante" by W. A. Mozart
 - "Summer" from “The seasons” by A. Vivaldi

Session II Stem cells: Threats and hopes

Chairman: Steinar Funderud, Professor, Rikshospitalet-Radiumhospitalet, Norway

- 13:25 - 13:55 **Tumor stem cells: Major players in cancer propagation**
Malcolm Alison, London, United Kingdom
- 13:55 - 14:25 **Signalling in stem cells and tumours**
Ariel Ruiz i Altaba, Geneva, Switzerland
- 14:25 - 14:55 **Establishment of permanent HIV-1 resistance by gene therapy**
Elena Perez, Pennsylvania, USA
- 14:55 - 15:25 **Panel discussion**
Ola Myklebost, Professor, Rikshospitalet-Radiumhospitalet
Dag Kvåle, Chief physician, Ullevål university hospital
Ernest Arenas, Professor, Developmental biology, Karolinska Institute
- 15:25 - 15:45 Coffee break

Session III Ethics of stem cell research

Chairman: Ernest Arenas, Karolinska Institute, Stockholm, Sweden

- 15:45 - 16:15 **Stem cell ethics**
Lars Østnor, Professor, MF Norwegian school of theology, Oslo, Norway
- 16:15 - 16:45 **Alternative sources of pluripotent stem cells?**
Ole Johan Borge, Senior adviser, Norwegian biotechnology advisory board, Oslo, Norway
- 16:45 - 17:15 **Panel discussion**
Ulla Schmidt, Dr. Theol., Centre for church research, Oslo
Marit Meelhus, Professor, Institute for social anthropology, University of Oslo
Joel Glover, Professor, University of Oslo
- 17:15 - 17:45 Coffee break

Session VI The biotech industry meets the stem cell challenge

Chairman: Arndt Rolfs, Head Marie Curie programme on regenerative medicine

- 17:45 - 19:05 **Developing stem cell based somatic transplantation technology**
Erik Miljan, ReNeuron, UK
- Stem cell engineering and its role in treating diabetes**
Alan Lewis, Novocell, San Diego, USA
- Derivation of a xeno-free human embryonic stem cell line**
Catharina Ellerström, Cellartis, Gothenburg, Sweden

- 19:05 - 19:25 **Panel discussion**
Mahendra Rao, Vice-president, research, Invitrogen
Martin Welschoff, CEO, Affitech
Yen Choo, CEO, Plasticell Ltd
- 19:25 - 19:30 **Closing remarks**, Lars Ødegaard, Head, Norwegian biotechnology advisory board
- 20.00 - 23-00 **Boat trip on the Oslo fjord**



Tuesday, May 15th

Industry and stem cells, stem cell differentiation

Place: Forskningsparken, Oslo innovation centre, Gaustadalléen 21, 0349 OSLO,
www.forskningsparken.no

- 09:00 - 09:30 **Welcome**
Stefan Krauss (Oslo) Head CAST biomedical innovation centre
Arndt Rolfs (Rostock) Head Marie Curie programme on regenerative medicine
- Opening: Special lecture
- 9.30 - 10.15 **Irma Thesleff (Helsinki, Finland)**
Signal pathways in the epithelial stem cell niche of teeth
- Industry meets the challenge
- 10.15 - 10.45 **Yen Choo (Plasticell, United Kingdom)**
Stem Cell Differentiation using Multiplexed Combinatorial Cell Culture Experiments
- 10.45 - 11.15 **Paul Kemp (Intercytex, United Kingdom)**
Evolution of the Intercytex business plan
- 11.15 - 11.30 Coffee break
- 11.30 – 12.00 **Nick Medcalf (Smith & Nephew Research Centre, United Kingdom)**
Bringing regenerative medicine to market – lessons from dermal repair products
- Stem cell systems
- 12.00 – 12.30 **Thorarinn Gudjonsson (Iceland)**
Breast epithelial stem cells and cancer
- 12.30 – 13.00 **Dennis Van Hoof (Utrecht, The Netherlands)**
Embryonic stem cell-derived cardiomyocytes
- 13.00 – 14.00 Lunch break

Neural stem cells

- 14.00 - 14.30 **Ernest Arenas (Stockholm, Sweden)**
Wnt signalling: from stem cells to dopaminergic neurons
- 14.30 - 15.00 **Alexander Storch (Dresden, Germany)**
Intracellular signalling mechanisms during initiation of dopaminergic specification of mesencephalic progenitor cells
- 15.00 – 15.30 **Stefan Krauss (Oslo, Norway)**
Wnt signalling in neural stem cell maintenance and maturation
- 15.30 - 15.45 Coffee break
- 15.45 - 16.15 **Katja Piltti (Helsinki, Finland)**
E6/E7 oncogenes increase and tumor suppressors decrease the proportion of self-renewing neural progenitor cells
- 16.15 – 16.45 **Suzuki Masatoshi (Madison, USA)**
Mitotic and neurogenic effects of dehydroepiandrosterone (DHEA) on human neural stem cell cultures derived from the fetal cortex
- 17.00 **Poster session with light food**
Location: Forskningsparken



Wednesday, May 16th

Stem cells sources, signalling and molecular imaging

Place: Forskningsparken, Oslo Innovation Centre, Gaustadalléen 21, 0349 OSLO,
www.forskningsparken.no

Opening: Special lecture

09.00 - 09.45 **Mahendra Rao (Invitrogen, Baltimore)**
Human embryonic stem cells and neurogenesis

Stem cell systems

9.45 - 10.15 **Ales Hampl (Brno, Czech Republic)**
Contribution of cell cycle regulators to the biology of mouse and human ES cells

10.15 - 10.45 **Ramkumar Mandalam (Cellerant Therapeutics, USA)**
Adult hematopoietic stem cells and its derivatives:
novel therapeutics for unmet Medical needs

10.45 - 11.15 **Timo Otonkoski (Helsinki, Finland)**
Pancreatic stem cells

11.15 - 11.30 Coffee break

Signalling in stem cells

11.30 – 12.00 **Angel Raya (Barcelona, Spain)**
Intrinsic and extrinsic determinants of embryonic stem cell pluripotency

12.00 - 12.30 **Weimin Zhong (New Haven, USA)**
Mechanisms of stem-cell homeostasis

12.30 – 13.00 **Xian-Jie Yang (Los Angeles, USA)**
Integration of cell-extrinsic signals by retinal progenitor cells

13.00 - 14.00 Lunch break

14.00 – 14.30 **Anna Bigas (Barcelona, Spain)**
Nuclear IKK activity leads to dysregulated notch-dependent gene expression in colorectal cancer

14.30 - 15.00 **Arndt Rolfs (Rostock, Germany)**
Small molecules and directed differentiation

15.00 - 15.30 **Johannes Schwarz (Leipzig, Germany)**
Oxygen and P2 receptors

15.30 - 15.45 Coffee break

Molecular imaging and stem cells



- 15.45 - 16.15 **Kat Hadjantonakis (New York, USA)**
Seeing is believing: optical imaging action in ES cells and mice
- 16.15 – 16.45 **Denez Kirik (Lund, Sweden)**
Cell therapy for Parkinson's disease: Current challenges for clinical translation
- 16.45 - 17.15 **Joseph Frank (Bethesda, Maryland, USA)**
Tracking the fate by MRI of magnetically labelled stem cells: Translation from bench to bedside
- 17.15 - 17.30 Coffee break
- 17.30 - 18.100 **Frederik Giesel (Heidelberg, Germany)**
Contrast-enhanced magnetic resonance imaging of central nervous system tumors: agents, mechanisms, and applications
- 18.00 - 18.30 **John Wolfe (Pennsylvania, USA)**
Engraftment patterns of transplanted neural stem cells and application to neurogenetic disease
- 18.30 - 19.00 **Elmir Omerovic (Gothenburg, Sweden)**
In vivo MR imaging of magnetically labelled human embryonic stem cells
- Concluding remarks
- 19.00 – 19.15 **Arndt Rolfs (Rostock, Germany) and Stefan Krauss (Oslo, Norway)**
- 20.00 **Closing dinner**
Location: Ekebergrestauranten
Transportation will be provided