



21 – 25 AUGUST 2017 / UNIVERSITY OF COPENHAGEN

STEM CELLS – BASIC CONCEPTS, DISEASE MODELLING AND LASTING THERAPIES

Embryonic and patient-derived stem cells are extremely versatile and widely applicable in biomedical research and regenerative medicine. They are used as in vitro disease models, for drug development and to generate cell or even organ replacements for lasting therapies of devastating diseases.

This course will provide in depth insights into the current state of the art regarding somatic, embryonic and induced pluripotent stem cells. We will provide expert insight into the basic biology of stem cells as well as into their potentials for modelling diseases, such as neurodegeneration, diabetes and skin disorders, as well as for their therapeutic use in diseases, such as Parkinson's disease, diabetes, blindness due to age-related macular degeneration, heart stroke, bone remodelling and reproduction. The course will also introduce state of the art gene editing.

WHAT YOU WILL LEARN

After the course, you will be able to:

- Understand research communication in detail on a broad range of stem cell issues
- Decide which stem cell models might serve your visions best
- Plan the generation of stem cell-derived target cell types such as neurons, beta cells as well as osteogenic and chondrogenic cells
- Understand and plan gene editing to repair mutations, insert mutations and generate knockouts and even insert whole genes
- Diligently discuss possibilities and current limitations in regenerative medicine using stem cells

COURSE CONTENT

The course consist of four main subjects:

1) *Basic stem cell biology*: We will bring you to the forefront of the basic biological properties of different stem cell types including mesenchymal (MSC), embryonic (ESC) and induced pluripotent stem (iPSC) cells. You will acquire knowledge of the derivation and culture of these cell types. Also, you will become familiar with cell potency and direct conversion of cell fate, by which a terminally differentiated cell type can be converted into another.

2) *Differentiation of stem cells*: We take you on a 360 degrees tour on the generation of terminally differentiated cells from MSCs, ESCs and iPSCs relevant for disease studies of neurodegeneration, diabetes and skin disorders as well as for future lasting therapy of such diseases. Present you with the state of the art use of such differentiated cells for disease modelling including i.e. neurodegenerative disorders and skin diseases.

3) *Gene editing*: You will receive a thorough theoretical introduction into the basic principles of gene editing and the use of the technology for repair or introduction of specific mutations, knockouts as well as insertion of whole genes. Furthermore, you will participate in a practical session for silicon preparation of the gene editing of your choice.

”Very impressive and well-thought through programme. Fantastic with so many and different perspectives on the topic.”

Pernille Autzen Usher, Consultant, Danish Regions about the course Personalised Medicine, 2015.



4) *Regenerative medicine*: You will meet some of the World’s leading scientists in regenerative medicine and the latest progress in transplantation of stem cell-derived regenerative tissue for lasting therapy will be debated. We will focus on areas such as e.g. transplantation of dopaminergic neurons in Parkinson’s disease, retinal epithelium pigment cells for blindness, beta cells for diabetes, MSCs for myocardial infarcts and osteogenic cells for bone repair. Likewise, we will discuss current ethical and societal challenges regarding stem cell work and regenerative medicine.

PARTICIPANTS

The course is intended as continuing professional development (CPD) for professionals in the pharmaceutical industry, medical doctors with relation to regenerative medicine, professionals from the ethical and legal regulatory affair area, professionals from the health care sector involved in education at all levels, academic researchers and lecturers as well as specialized science journalists.

Participants should

- Have a bachelor in science, medicine or similar discipline
- Be proficient in English

COURSE DATES

5 days, 21 – 25 August 2017, 9:00 – 16:30 at the University of Copenhagen, Frederiksberg Campus.

COURSE DIRECTORS

Poul Hyttel, Professor, Group of Stem Cells and Embryology, University of Copenhagen

Kristine Freude, Associate Professor, PhD, Group of Stem Cells and Embryology, University of Copenhagen

Vanessa Hall, Associate Professor, Group of Stem Cells and Embryology, University of Copenhagen

OTHER COURSE TEACHERS

Anders Björklund, Professor, Neurobiology Unit, Lund University

Moustapha Kassem, Professor, Department of Cellular and Molecular Medicine, University of Copenhagen

Jacqueline Ameri, Assistant Professor, Human Stem Cell Biology LaB, The Danish Stem Cell Center, University of Copenhagen

Nicolaj Strøyer Christophersen, Senior Project Manager, PhD, Novo Nordisk A/S

Yonglun Luo, PhD, Associate Professor, Department of Biomedicine, Aarhus University

Malin Palmar, PhD, Developmental and Regenerative Neurobiology, Lund University

Agnete Kirkeby, PhD, Human Neural Development, Wallenberg Neuroscience Center, Lund University

Joshua Brickman, Professor of Stem Cell and Developmental Biology, University of Copenhagen

Mark Denham, Group leader, associate professor, Denham Group, Department of Biomedicine, Aarhus University

Karina Fog, Head of Department, Lundbeck Pharma A/S

Peter Sandøe, Professor, Section for Animal Welfare and Disease Control, University of Copenhagen

Frank Edenhofer, Professor, Genomics, Stem Cell Biology and Regenerative Medicine, University of Innsbruck

Hans Wandall, Professor, MD, PhD, Department of Cellular and Molecular Medicine, University of Copenhagen

Cord Brakebusch, Professor, Section of Molecular Pathology, University of Copenhagen

Jens Kastrup, Professor, Consultant Surgeon, The Heart Centre, Rigshospitalet

András Dinnyes, Professor, CEO, Genetic Reprogrammer, Szent Istvan University

Claus Yding Andersen, Professor, Department of Clinical Medicine, University of Copenhagen

COURSE FEE

EUR 2,600/DKK 19,000. Fee includes teaching, course materials, and all meals during course and examination.

FOR MORE INFORMATION AND REGISTRATION:
copenhagensummeruniversity.ku.dk

