

# COURSE MANUAL

## INTRO TO STEM CELLS

### 7<sup>th</sup> January – 18<sup>th</sup> January 2019

For info, please contact Koen Braat. [k.braat@umcutrecht.nl](mailto:k.braat@umcutrecht.nl)

This course will address diverse topics in stem cell biology and aims to bring together basic principles of stem cell biology and developmental biology, current techniques and models, and stem cell applications in regenerative medicine. Topics in the course are embryology, embryonic stem cells, induced pluripotent stem cells, in vivo stem cell models, identification of stem cells, organoids and epithelial stem cells, hematopoietic stem, the stem cell niche, skin and eye stem cells, cancer stem cells, and application of stem cell in regenerative medicine.

**Course venue: Stratenum VONDELZAAL (3<sup>rd</sup> floor)** (unless indicated otherwise in the daily program)

Attendance is **mandatory**. Missing lectures will result in failing the course. In case of absence always inform one of the coordinators beforehand. [k.braat@umcutrecht.nl](mailto:k.braat@umcutrecht.nl) and [pcoffer@umcutrecht.nl](mailto:pcoffer@umcutrecht.nl)

Grading:

The grading will be based on participation (40%) and the final exam (60%).

Participation is based on actively participating in the course and making outline notes and two open answer exam questions and 1 closed answer question (including answers) of **two** pre-assigned lectures.

Our goal is to provide PDFs of the lectures. These will be made available on the website of the course after the outline notes have been submitted.

**IMPORTANT:** It is not allowed to make video recordings/audio recordings or to take pictures of the presentations.

Enjoy the course

Koen Braat & Paul Coffey

## Monday 7<sup>th</sup> January

### Embryo, signaling and stem cell models

- 10.30-10.45    **Introduction to the course**  
**Dr. Koen Braat (Center for Molecular Medicine and Regenerative Medicine)**
- 10.45-11.45    **From embryo to embryonic stem cells**  
**Dr. Bernard Roelen (Faculty of Veterinary Medicine UU)**
- 12.00-13.00    **Signaling dynamics in stem cell biology**  
**Katharina Sonnen (Hubrecht Institute)**
- 13.00-13.45    Lunch
- 13.45-14.45    **Animal models to study tissue regeneration**  
**Dr. Kerstin Bartscherer (Hubrecht Institute)**
- 14.45-17.00    **Preparation masterclass**

## Tuesday 8<sup>th</sup> January

### ESC and reprogramming

- 9.45-10.45    **Patient specific stem cells in different states of pluripotency**  
**Bjorn Heindryckx (Ghent University Hospital, Belgium)**
- 11.00-12.00    **De novo formation of gametes from embryonic stem cells (open to all)**  
**Bjorn Heindryckx (Ghent University Hospital, Belgium)**
- 12.00-12.45    Lunch
- 12.45-13.45    **masterclass: Cellular reprogramming-Induced Pluripotent Stem Cells**  
**Abdenour Soufi (MRC Center for Regenerative Medicine, Edinburgh, UK)**
- 14.00-15.00    **Seminar Cellular reprogramming-Induced Pluripotent Stem Cells (open to all)**  
**Abdenour Soufi (MRC Center for Regenerative Medicine, Edinburgh, UK)**

## Wednesday 9<sup>th</sup> January

### Organization and Tissue stem cells

- 10.15-11.15 **Self-organization in embryo development**  
**Dr. Nicolas Rivron (MERLN Institute and Hubrecht Institute)**
- 11.30-12.30 **Stem cells in bone development**  
**Dr. Debby Gawlitta (UMC Utrecht)**
- 12.30-13.15 **Lunch**
- 13.15-14.15 **Muscle stem cells**  
**Dr. Gerben Schaaf (Erasmus MC, Rotterdam)**
- 14.30-15.30 **Stem cells in cartilage and bioprinting tissue models**  
**Florenzia Abinzano (UMC Utrecht)**

## Thursday 10<sup>th</sup> January

- 9.00-13.30 **Preparation of Q(uestions)&A(nswers) and lecture by Prof. Michele de Luca**
- 12.45-13.45 **Identifying stem cells. STEM-ID**  
**Anna Alemany Arias (Hubrecht Institute)**
- 13.45-14.45 **Preparation of Q&A and prep for lecture by Prof. Michele de Luca**
- 14.45-15.30 **Q&A**  
**Prof. Michele de Luca (Center for Regenerative Medicine University of Modena and Reggio Emilia, Italy)**
- 15.45-17.00 **Seminar: Combined cell and gene therapy of Epidermolysis Bullosa shed light on human epidermal stem cells (open to all)**  
**Prof. Michele de Luca (Center for Regenerative Medicine University of Modena and Reggio Emilia, Italy)**

## Friday 11<sup>th</sup> January

- 9.00-10.00 **(Intestinal) stem cells and Organoids**  
**Prof. Hans Clevers (Prinses Maxima Center and Hubrecht Institute)**
- 10.15-11.15 **Liver stem cells**  
**Dr. Bart Spee (UU)**
- 11.30-12.30 **Stem cells in the pancreas. Biology and application**  
**Dr. Françoise Carlotti (LUMC)**
- 12.30-13.15 **Lunch**
- 13.15-14.15 **Mutations in stem cells**  
**Dr. Ruben van Boxtel (Prinses Maxima Center)**

## Monday 14<sup>th</sup> January

- 10.30-11.30 **Hematopoietic stem cells**  
**Dr. Catherine Robin (Hubrecht Institute)**
- 11.45-12.45 **The stem cell niche. Bone marrow microenvironment and hematopoietic disorders**  
**Dr. Marc Raaijmakers (Erasmus MC, Rotterdam)**
- 12.45-13.30 **Lunch**
- 13.30-14.30 **Regenerative nephrology**  
**Prof. Marianne Verhaar (UMCU)**
- 14.45-15.45 **(re)generation of the heart**  
**Prof. Eva van Rooij (Hubrecht Institute)**

## Tuesday 15<sup>th</sup> January

**Seminar Stem cells in the eye. Location UMCU in Q auditorium.**

- 11.15-12.15    **Aging in stem cells**  
**Prof. Gerald de Haan (ERIBA, UMCG)**
- 12.15-13.00    **Lunch**
- 13.00-14.00    **Stem cells in the brain**  
**Prof. Jeroen Pasterkamp (UMC Utrecht)**
- 14.15-15.15    **masterclass: Stem cells in the eye.**  
**Prof. Graziella Pellegrini (Center for Regenerative Medicine “Stefano Ferrari”, Italy)**
- 15.30-16.30    **Seminar: Stem cells in the eye (open to all) (Q auditorium UMCU)**  
**Prof. Graziella Pellegrini (Center for Regenerative Medicine “Stefano Ferrari”, Italy)**

## Wednesday 16<sup>th</sup> January

- 9.30-10.30    **Cancer stem cells**  
**Prof. Louis Vermeulen (AMC)**
- 10.45-11.45    **Leukemic cancer stem cells**  
**Dr. Mirjam Belderbos (Prinses Maxima Center, Utrecht)**
- 11.45-13.00    **Lunch**
- 13.00-14.00    **Marketing of unproven stem cell based interventions**  
**Dr. Esther van Zimmeren (University of Antwerp, Belgium)**  
Perhaps 14.00-15.00 depending on travel time

## Thursday 17<sup>th</sup> January

**Self study**

## Friday 18<sup>th</sup> January

**Exam                    Location to be announced**

List of speakers

Florencia Abinzano	UMC Utrecht	<a href="mailto:F.Abinzano@umcutrecht.nl">F.Abinzano@umcutrecht.nl</a>
Dr. Anna Alemany Arias	Hubrecht Institute	<a href="mailto:a.alemany@hubrecht.eu">a.alemany@hubrecht.eu</a>
Dr. Kerstin Bartscherer	Hubrecht Institute	<a href="mailto:k.bartscherer@hubrecht.eu">k.bartscherer@hubrecht.eu</a>
Dr. Mirjam Belderbos	Prinses Maxima Center	<a href="mailto:M.E.Belderbos@prinsesmaximacentrum.nl">M.E.Belderbos@prinsesmaximacentrum.nl</a>
Dr. Ruben van Boxtel	Prinses Maxima Center	<a href="mailto:R.vanBoxtel@prinsesmaximacentrum.nl">R.vanBoxtel@prinsesmaximacentrum.nl</a>
Dr. Françoise Carlotti	Leiden UMC	<a href="mailto:F.Carlotti@lumc.nl">F.Carlotti@lumc.nl</a>
Prof. Hans Clevers	Prinses Maxima Center and Hubrecht Institute	<a href="mailto:h.clevers@hubrecht.eu">h.clevers@hubrecht.eu</a>
Dr. Debby Gawlitta	UMC Utrecht	<a href="mailto:d.gawlitta@umcutrecht.nl">d.gawlitta@umcutrecht.nl</a>
Prof. Gerald de Haan	ERIBA, UMC Groningen	<a href="mailto:g.de.haan@umcg.nl">g.de.haan@umcg.nl</a>
Prof. Bjorn Heindryckx	Ghent University Hospital, Belgium	<a href="mailto:Bjorn.Heindryckx@UGent.be">Bjorn.Heindryckx@UGent.be</a>
Prof. Michele de Luca	Center for Regenerative Medicine University of Modena and Reggio Emilia, Italy	<a href="mailto:michele.deluca@unimore.it">michele.deluca@unimore.it</a>
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Prof. Louis Vermeulen	Amsterdam Medical Center	<a href="mailto:l.vermeulen@amc.nl">l.vermeulen@amc.nl</a>
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