



MGC course ' **Genetic engineering in model organisms: technology and application in basic and medical research** '

Date: **17-21 June, 2019 (3 days course and 2-day international workshop on Innovative Mouse Models)**

Location: LUMC

[Registration](#)

Note: Friendly request to fill in the name of your department and institute at the registration!

**This course will deal with the basic principles underlying the generation of transgenic, knock-out (KO) and knock-in (KI, *i.e.*, gene-modified rather than gene-inactivated) mice.**

KO and KI mice were traditionally made through Embryonic stem cell (ESC) technology. ESC derivation, *in vitro* genetic modification and use in the generation of chimeric mice represent another main theme of the course.

Most recently, the spectacular advances in CRISPR/Cas9-assisted gene modification have found wide application in mouse genetics. CRISPR/Cas9-technology strongly facilitates gene targeting in ESCs, but can also directly be used in zygotes, evading the ESC route. Both applications will be presented, as well as the application of CRISPR/Cas9 technology in non-germ-line gene modification.

The course will consist of lectures covering technology and applications of genetic engineering in basic and medical research. Practical demonstrations will show crucial steps in the generation of transgenic, KO and KI mice, and principles of *in vivo* imaging.

**The first three days of the course will prepare participants for the 2-day international workshop on Innovative Mouse Models (IMM 2019) immediately following the course.**

There is a minimum of 14 and a maximum of 25 places. Deadline for registration 3 June, 2019. Should the course be oversubscribed then places will be allocated based on a first-come first-serve basis.

The course is free of charge for all members of MGC associated departments and the Research School OOA. Participants from the academic world other than the aforementioned departments pay €600 (3 days course and two days symposia including one dinner). Course fee for participants outside these institutes is €750.

## Programme from previous edition - 2017

Monday, June 12, 2017

### Morning

#### LUMC hospital (building 1), Lecture Hall 2

09.00 - 09.15	Introduction/course setup	<b>Sjef Verbeek</b>
09.15 - 10.00	Origin/genetics of laboratory mice	<b>Jan-Bas Prins</b>
10.00 - 10.45	Genetic modifiers Epigenetic modifiers Gut bacterial modifiers	<b>Sjef Verbeek</b> <b>Lucia Clemens-Daxinger</b> <b>Els Robanus-Maandag</b>
10.45 - 11.00	<i>Coffee break</i>	
11.00 - 12.00	Conventional transgenesis/ Gene targeting in ES cells	<b>Sjef Verbeek</b>
12.00 - 12.45	CRISPR/Cas9-assisted Gene modification/gRNA design	<b>Sjef Verbeek</b> <b>Cor Breukel</b>
12.45 - 13.45	<i>Introduction participants</i> <i>Lunch (will be provided throughout the week to all participants free of charge; tea/coffee will be provided at 3-4 pm)</i>	

### Afternoon

#### LUMC hospital (building 2), Meeting room T-00-022(T-00-008/T-00-012/S-00-022)

13.45 - 15.30	Demonstrations <i>a. Microinjection</i> <i>b. ES cell culture</i> Literature study	<b>Margot Linssen</b> <b>Jill Claassens/Conny Brouwers</b>
15:30 - 17:00	Histology/obduction	<b>Daniela Salvatori</b>

Tuesday, June 13, 2017

**Morning**

**LUMC hospital (building 1), Lecture Hall 2**

09.00 - 10.00	How to make a construct/ recombineering	<b><i>Cor Breukel</i></b>
10.00 - 10.45	Conditional gene targeting	<b><i>Els Robanus-Maandag</i></b>
10.45 - 11.00	<i>Coffee break</i>	
11.00 - 11.45	Oligo targeting <i>versus</i> CRISPR/Cas9 in ES cells	<b><i>Hein te Riele</i></b>
11.45 - 12.30	Toolbox transgenesis	<b><i>Ivo Huijbers</i></b>
12.30 - 13.30	<i>Lunch</i>	

**Afternoon**

**LUMC hospital (building 1), Lecture Hall 2**

13.30 - 14.00	Imaging technologies	<b><i>Eric Kaijzel</i></b>
14.00 - 14.30	Mouse clinic	<b><i>Jos Jonkers</i></b>
14.30 - 16.00	Demonstrations <i>a. Bioluminescence</i> <i>b. Multiphoton imaging</i> <i>c. MRI</i>	<b><i>Ivo Que</i></b> <b><i>Annelies van der Laan</i></b> <b><i>Ernst Suidgeest</i></b>
16.00 - 16.15	<i>Tea break</i>	
16.15 - 17.00	Preparation of literature presentations	

Wednesday, June 14, 2017

## **Morning**

### **LUMC hospital (building 1), Lecture Hall 2**

- 09.00 - 10.20 Literature presentations/discussion
- 10.20 - 10.35 *Coffee break*
- 10.35 - 12.00 Literature presentations/discussion
- 12.00 - 12.30 Drosophila ***Catherine Rabouille***
- 12.30 - 13.00 C. elegans ***Rik Korswagen***
- 13.00 - 14.00 *Lunch*

## **Afternoon**

### **LUMC hospital (building 1), Lecture Hall 2**

- 14.00 - 14.30 Cell fate in hematopoiesis ***Catherine Robin***
- 14.30 - 15.00 Fragile X syndrome ***Renate Hukema***
- 15.00 - 15.30 Cardiovascular disease ***Ko Willems van Dijk***
- 15.30 - 15.45 *Tea break*
- 15.45 - 16.15 Migraine ***Arn van den Maagdenberg***
- 16.15 - 17.00 Forum on Mouse models for diseases: do they gratify?  
Renate Hukema (Fragile X syndrome)  
Ko Willems van Dijk (Cardiovascular disease)  
Arn van den Maagdenberg (Migraine)

## **Thursday and Friday**

**the 2-day international workshop on Innovative Mouse Models (IMM 2019)**