

**Master Course 2016-2017 - UAM**  
**BMM11 module: Genetically Modified Animals: Strategies and applications**  
**Masters UAM of Molecular Biomedicine**  
**19 September-28 October 2016 (Monday to Friday)**  
**15:00-16:30 h**  
**School of Medicine, UAM, Campus "La Paz", Seminar-room 9**

**Coordinators:**

**Lluís Montoliu (CNB-CSIC)**  
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**Invited faculties:**

**Juan Bernal**  
CNIC

**Paola Bovolenta**  
CBMSO-CSIC/UAM

**Marcos Malumbres**  
CNIO

**Francisco J. Martínez Mojica**  
Universidad de Alicante

**Mónica Musteanu**  
CNIO, Experimental Oncology group

**Matthias Drosten**  
CNIO, Experimental Oncology group

**Latifa Bakiri**  
CNIO, Genes, development and disease group

**Sergio Ruiz**  
CNIO, Genomic Instability Group

**All lectures will be delivered in English**

## BMM11 PROGRAM – MASTER UAM COURSE 2016/2017

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### **Monday, 19 September 2016**

Introduction to BMM11 module: evaluation criteria (15 min)

Coordinators: **Lluís Montoliu**, CNB-CSIC; **Miguel Manzanares**, CNIC; **Sagrario Ortega**, CNIO; **Belén Pérez**, UAM

Use of mice in biomedicine: history, genetics

**Miguel Manzanares**, CNIC

### **Tuesday, 20 September 2016**

Mouse biology and developmental biology I

**Miguel Manzanares**, CNIC

### **Wednesday, 21 September 2016**

Mouse biology and developmental biology II

**Miguel Manzanares**, CNIC

### **Thursday, 22 September 2016**

Transgenic animals I

**Lluís Montoliu**, CNB-CSIC

### **Friday, 23 September 2016**

**Student's presentation/discussion of selected papers (SEMINAR 1)**

**Lluís Montoliu**, CNB-CSIC

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### **Monday, 26 September 2016**

Transgenic animals II

**Lluís Montoliu**, CNB-CSIC

### **Tuesday, 27 September 2016**

Transgenic animals III

**Lluís Montoliu**, CNB-CSIC

### **Wednesday, 28 September 2016**

Gene regulatory analysis in the mouse

**Miguel Manzanares**, CNIC

### **Thursday, 29 September 2016**

ES cells and knockout mice I

**Sagrario Ortega**, CNIO

### **Friday, 30 September 2016**

**Student's presentation/discussion of selected papers (SEMINAR 2)**

**Miguel Manzanares**, CNIC

**Sagrario Ortega**, CNIO

## BMM11 PROGRAM – MASTER UAM COURSE 2016/2017

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### Monday, 3 October 2016 (from 15:30 to 17:00)

ES cells and knockout mice II

**Mónica Musteanu**, Experimental Oncology group (CNIO)

### Tuesday, 4 October 2016

ES cells and knockout mice III

**Matthias Drosten**, Experimental Oncology group (CNIO)

### Wednesday, 5 October 2016

Reprogramming/iPS cells

**Sagrario Ortega**, CNIO

### Thursday, 6 October 2016

Genome Editors I: ZFNs and TALENs

**Lluís Montoliu**, CNB-CSIC

### Friday, 7 October 2016

**Student's presentation/discussion of selected papers (SEMINAR 3)**

**Sagrario Ortega**, CNIO

**Lluís Montoliu**, CNB-CSIC

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### Monday, 10 October 2016

*Invited seminar (CRISPR)*

Genome Editors II: The origin of the CRISPR-Cas systems

**Francisco J. Martínez Mojica**, Universidad de Alicante

### Tuesday, 11 October 2016

Genome Editors III: CRISPR-Cas9 applications for genome editing

**Lluís Montoliu**, CNB-CSIC

### Wednesday, 12 October 2016

**National Fest**

### Thursday, 13 October 2016

Mouse functional genomic analysis. Bioinformatic Tools, examples

**Lluís Montoliu**, CNB-CSIC

### Friday, 14 October 2016

**Student's presentation/discussion of selected papers (SEMINAR 4)**

**Miguel Manzanares**, CNIC

**Lluís Montoliu**, CNB-CSIC

## BMM11 PROGRAM – MASTER UAM COURSE 2016/2017

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### Monday, 17 October 2016

Using CRISPR-Cas tools for genetic screenings in cells  
**Sergio Ruiz**, Genomic Instability Group (CNIO)

### Tuesday, 18 October 2016

*Mouse models to study liver cancer*  
**Latifa Bakiri**, Genes, development and disease group (CNIO)

### Wednesday, 19 October 2016

*Invited seminar (mouse animal model)*  
Mouse models in cell cycle research  
**Marcos Malumbres**, CNIO

### Thursday, 20 October 2016

**Student's presentation/discussion of selected papers (SEMINAR 5)**  
**Sagrario Ortega**, CNIO

### Friday, 21 October 2016

**Fest of School of Medicine**

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### Monday, 24 October 2016

Videos on transgenic mice, ES cells and knockout mice  
**Lluís Montoliu**, CNB-CSIC

### Tuesday, 25 October 2016

*Invited seminar (pig animal model)*  
Advances in animal transgenesis: new tools for a new era  
**Juan Bernal**, CNIC

### Wednesday, 26 October 2016

*Invited seminar (fish animal models)*  
Using zebrafish and medaka as animal models  
**Paola Bovolenta**, CBMSO

### Thursday, 27 October 2016

**Student's presentation/discussion of selected papers (SEMINAR 6)**  
**Miguel Manzanares**, CNIC

### Friday, 28 October 2016

**Final Exam (60 min), Correction and discussion afterwards (30 min)**  
**Sagrario Ortega**, CNIO  
**Lluís Montoliu**, CNB-CSIC  
**Miguel Manzanares**, CNIC

## BMM11 Module, Evaluation Criteria Course 2016-2017

**Participation (3 points, 30%):** Students, in groups of 2-4 persons, will present and discuss a selected scientific article, in English, to the rest of the classroom (25 min). Three papers will be presented each seminar day. Presenting students should engage the rest of students in the class to actively participate in the discussions. Their contribution to the discussions will also be accounted for the evaluation of the group presenting each article.

**Written report (3 points, 30%):** Each student will receive a gene and will have to prepare a written short report (**4 pages max**, in English) on **existing animals models** using this gene or its mutations and their relevance and contribution to the understanding of the associated diseases or physiological role of the protein/RNA in the organism. This written report will have to be ready and uploaded at the “UAM Biociencias-Master” web server through the *moodle* application, **by November 18, 2016**.

**Exam (4 points, 40%):** The exam (60 min) will be prepared as a test of **30 questions** with 5 possible answers (only 1 will be correct). Wrong answers will not decrease the final mark. The correct answer for each and every question will be provided and discussed at the end of the exam (30 min).