

**Master Course 2011-2012 - UAM**  
**BM5 module: GENOMICS, PROTEOMICS AND GENETIC MODIFICATION**  
**Masters of Molecular Biomedicine, Biotechnology,**  
**and Molecular and Cellular Biology**  
**26 September-4 November 2011 (Monday to Friday) 15:00-16:30 h**  
**Aula I: School of Medicine, UAM**

**Teachers:**

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**All lectures will be delivered in English**

## BM5 PROGRAM

### Monday, 26 September 2011

Introduction to BM5 module: evaluation criteria (30 min)

#### Coordinators

**M<sup>a</sup> Jesús Bullido**, CBMSO-UAM/CSIC

**Lluís Montoliu**, CNB-CSIC

Introduction to the Human Genome (60 min)

**Lourdes Ruiz**, CBMSO-UAM/CSIC

### Tuesday, 27 September 2011

Genetic maps of the Human Genome. Gene identification

**Lourdes Ruiz**, CBMSO-UAM/CSIC

### Wednesday, 28 September 2011

Epigenetics

**José Fernández Piqueras / Pilar López Nieva**, CBMSO-UAM/CSIC

### Thursday, 29 September 2011

Use of mice in biomedicine: history, genetics

**Miguel Manzanares**, CNIC

### Friday, 30 September 2011

Mouse biology and developmental biology

**Miguel Manzanares**, CNIC

### Monday, 3 October 2011

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

**M<sup>a</sup> Jesús Bullido**, CBMSO-UAM/CSIC

**Lluís Montoliu**, CNB-CSIC

### Tuesday, 4 October 2011

Transgenic animals I: standard, genomic, inducible, applications and limitations

**Lluís Montoliu**, CNB-CSIC

### Wednesday, 5 October 2011

Transgenic animals II: lentivirus, transposons, nuclear transfer, Zn-finger nucleases

**Lluís Montoliu**, CNB-CSIC

### Thursday, 6 October 2011

ES cells and knockout mice I: standard

**Sagrario Ortega**, CNIO

### Friday, 7 October 2011

Knockout mice II: inducible, tissue-specific, knockins

**Sagrario Ortega**, CNIO

### Monday, 10 October 2011

iPS cells et al.

**Sagrario Ortega**, CNIO

**Tuesday, 11 October 2010**

Videos on transgenic mice, ES cells and knockout mice  
**Lluís Montoliu**, CNB-CSIC; **Sagrario Ortega**, CNIO

**Wednesday, 12 October 2011**

**Holiday – National Day**

**Thursday, 13 October 2011**

RNAi: fundamentals and applications in animal transgenesis  
**Susana González**, CNIC

**Friday, 14 October 2011**

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

**Sagrario Ortega**, CNIO  
**Lluís Montoliu**, CNB-CSIC

**Monday, 17 October 2011**

**Holiday – School of Medicine Fest**

**Tuesday, 18 October 2011**

Mouse functional genomic analysis. Bioinformatic Tools, examples  
**Lluís Montoliu**, CNB-CSIC

**Wednesday, 19 October 2011**

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

**Susana González**, CNIC  
**Sagrario Ortega**, CNIO

**Thursday, 20 October 2011**

Monogenic hereditary diseases. Pathological mutations.  
**Belén Pérez**, CBMSO-UAM/CSIC

**Friday, 21 October 2011**

Complex diseases. Genetic association. Gene-gene and gene-environment interactions.  
**M<sup>a</sup> Jesús Bullido**, CBMSO-UAM/CSIC

**Monday, 24 October 2010**

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

**Lourdes Ruiz**, CBMSO-UAM/CSIC  
**Belén Pérez**, CBMSO-UAM/CSIC  
**M<sup>a</sup> Jesús Bullido**, CBMSO-UAM/CSIC

**Tuesday, 25 October 2010**

Genomics: Microarray tools to study human pathology  
**M<sup>a</sup> Jesús Bullido**, CBMSO-UAM/CSIC

**Wednesday, 26 October 2010**

Pharmacogenetics/Pharmacogenomics  
**Carmen Ayuso**, Instituto de Investigación Sanitaria-Fundación Jiménez Díaz

**Thursday, 27 October 2010**

Proteomics: basic issues and applications  
**Ana Isabel Marina**, ProteoRed (CBM-CSIC)

**Friday, 28 October 2010**

Proteomic techniques for the study of inherited metabolic diseases  
**Eva Richard**. CBMSO

**Monday, 31 October 2010**

Experimental therapies. Gene and mutation specific therapies  
**Lourdes Ruiz**, CBMSO-UAM/CSIC

**Tuesday, 1 November 2011**

**National Holiday**

**Wednesday, 2 November 2011**

**Student's presentation/discussion of selected papers (SEMINAR 5)**

**M<sup>a</sup> Jesús Bullido**, CBMSO-UAM/CSIC  
**Lourdes Ruiz**, CBMSO-UAM/CSIC  
**Belén Pérez**, CBMSO-UAM/CSIC

**Thursday, 3 November 2011**

Clinical realities of cell therapies. Applications and translational research  
**Damián García Olmo**, Hospital La Paz-IdiPaz

**Friday, 4 November 2011**

**Final Exam (60 min), Correction and discussion afterwards (30 min)**

**Miguel Manzanares**, CNIC  
**Lluís Montoliu**, CNB-CSIC  
**Susana González**, CNIC  
**Sagrario Ortega**, CNIO  
**M<sup>a</sup> Jesús Bullido**, CBMSO-UAM/CSIC  
**Lourdes Ruiz**, CBMSO-UAM/CSIC  
**Belén Pérez**, CBMSO-UAM/CSIC

## **BM5 Module, Evaluation Criteria Course 2011-2012**

**Attendance (1 point, 10%):** Attendance is mandatory. All students will receive 1 point unless they miss classes without providing a written justification.

**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) summarising what is known about this gene in different species, notably Human and mouse, its information about genomics and proteomics, published key references, its relationship with known human pathologies, the existence of animal models, etc... according to the topics covered throughout the course. This written report will have to be ready and uploaded at the "UAM Biociencias-Master" web server through the moodle application, **by November 30, 2011**.

**Exam (3 points, 30%):** The exam (60 min) will be prepared as a test of **25 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).