

**Master Course 2010-2011 - UAM**  
**BM5 module: GENOMICS, PROTEOMICS AND GENETIC MODIFICATION**  
**Masters of Molecular Biomedicine, Biothechnology,**  
**and Molecular and Cellular Biology**  
**20 September-29 October 2010 (Monday to Friday) 15:00-16:30 h**  
**Aula I: School of Medicine, UAM**

**Teachers:**

**María Jesús Bullido (CBMSO-UAM/CSIC) - coordinator**  
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**Invited teachers:**

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**Janet Hoenicka (Hospital 12 de Octubre)**  
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All lectures will be delivered in English

## **BM5 PROGRAM**

### **Monday, 20 September 2010**

Introduction to BM5 module: evaluation criteria (30 min)

#### **Coordinators**

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

**Lluís Montoliu**, CNB-CSIC

Organization of the Human Genome (60 min)

**José Fernández Piqueras**, CBMSO-UAM/CSIC

### **Tuesday, 21 September 2010**

Physical and genetic maps of the Human Genome. Analysis of genetic linkage

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

### **Wednesday, 22 September 2010**

Monogenic hereditary diseases. Pathological mutations.

**Belén Pérez**, CBMSO-UAM/CSIC

### **Thursday, 23 September 2010**

Complex diseases. Genetic association and pathogenesis. Interactions.

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

### **Friday, 24 September 2010**

**Student's presentation/discussion of selected papers**

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

**Belén Pérez**, CBMSO-UAM/CSIC

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

### **Monday, 27 September 2010**

Genomic Tools to study human pathology

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

### **Tuesday, 28 September 2010**

Epigenetics

**José Fernández Piqueras**, CBMSO-UAM/CSIC

### **Wednesday, 29 September 2010**

Experimental therapies

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

### **Thursday, 30 September 2010**

Proteomics: basic issues and applications to study human physiopathology

**Juan Antonio López**, CNIC

**Friday, 1 October 2010**

**Student's presentation/discussion of selected papers**

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

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

**Belén Pérez**, CBMSO-UAM/CSIC

**Monday, 4 October 2010**

Clinical realities of cell therapies. Applications and translational research

**Damián García Olmo**, Hospital La Paz

**Tuesday, 5 October 2010**

Pharmacogenetics and Pharmacogenomics

**Janet Hoenicka**, Hospital 12 de octubre

**Wednesday, 6 October 2010**

Use of mice in biomedicine: history, genetics

**Miguel Manzanares**, CNIC

**Thursday, 7 October 2010**

Mouse biology and developmental biology

**Miguel Manzanares**, CNIC

**Friday, 8 October 2010**

**Student's presentation/discussion of selected papers**

**Miguel Manzanares**, CNIC

**Lluís Montoliu**, CNB-CSIC

**Monday, 11 October 2010**

Transgenic animals I: standard, genomic, applications and limitations

**Lluís Montoliu**, CNB-CSIC

**Tuesday, 12 October 2010**

**Holiday – National Day**

**Wednesday, 13 October 2010**

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

**Lluís Montoliu**, CNB-CSIC

**Thursday, 14 October 2010**

ES cells and knockout mice I: standard

**Sagrario Ortega**, CNIO

**Friday, 15 October 2010**

**Student's presentation/discussion of selected papers**

**Sagrario Ortega**, CNIO

**Lluís Montoliu**, CNB-CSIC

**Monday, 18 October 2010**

**Holiday – School of Medicine Feast**

**Tuesday, 19 October 2010**

Knockout mice II: inducible, tissue-specific, knockins  
**Sagrario Ortega**, CNIO

**Wednesday, 20 October 2010**

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

**Thursday, 21 October 2010**

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

**Friday, 22 October 2010**

**Student's presentation/discussion of selected papers**  
**Susana González**, CNIC  
**Sagrario Ortega**, CNIO

**Monday, 25 October 2010**

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

**Tuesday, 26 October 2010**

Stem Cells, Aging and Regeneration  
**Susana González**, CNIC

**Wednesday, 27 October 2010**

iPS cells et al.  
**Sagrario Ortega**, CNIO

**Thursday, 28 October 2010**

**Student's presentation/discussion of selected papers**  
**Miguel Manzanares**, CNIC  
**Lluís Montoliu**, CNB-CSIC  
**Susana González**, CNIC  
**Sagrario Ortega**, CNIO

**Friday, 29 October 2010**

**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 2010-2011**

**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, **by November 30, 2010**.

**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).