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## ***Teach Mob – Visiting Professors*** ***Academic year 2015/2016***

<b>1st term</b>
<b>COURSE TITLE</b> <b>Biotechnology of the development</b>
<b>Scientific area</b> <b>Biotechnology</b>
<b>Department of Molecular Biotechnologies and Health Sciences</b>
<b>Language used to teach</b> <b>ENGLISH</b>
<p><b>Course summary</b></p> <p>The course (total 48 hrs of frontal lessons, 8 CFU) will follow this program; the Visiting Professor will provide a minimum of 16 hr of frontal lessons:</p> <p>General concepts and principles late embryonic development.</p> <p>Animal models to study late embryonic development: mutant mice, chicken embryo, Xenopus, Danio rerio...</p> <p>Description and discussion of the available genetic resources of animal models carrying specific mutations.</p> <p>General concepts and principles late embryonic development.</p> <p>Development and differentiation of a) the skeletal system, b) cranio-facial structures including skeleton and muscles, b) neural crest derivatives in the trunk and in the head, c) the reproductive system and sex determination, d) stem cells and bone regeneration.</p> <p>The mechanisms governing the genesis of different facial components, including tooth, muscles, nerves and vessels will be discussed as an example to illustrate the capacity to harmonize complex morphogenetic processes to give rise to functional organs</p> <p>Evolutionary implications</p> <p>Medical implications, osteoporosis, craniofacial malformations, premature ovarian insufficiency.</p>
<p><b>Learning objectives</b></p> <p>Students will be exposed to fundamental concepts in developmental biology focusing on cell interactions, genetic determinants and signalling cascades at the origin of the morphogenetic events occurring in late stages of embryonic development. They will learn about how cells derived from the neural crest or from somites contribute to the generation of structures of the trunk and of the head and about the genetic difference in these large compartments of the body. The origin of craniofacial structures will be placed in an evolutionary perspective. A second part of the course will be devoted to discuss the development of the male and female reproductive systems and on the genetic mechanisms of sex determination. The medical implications of each topic of this module will be presented and discussed in the light of possible future progress in treatment of pathology. Students will also learn to read and present (in English) scientific articles in the field and will be exposed to discussions and round-table meetings held together with Doctorate students.</p>
<p><b>Tutorship activities</b></p> <p>In each course students will be invited to present orally, shortly (15 min maximum) and in English a scientific article relevant to the topic of the course. The quality of the presentation and of the following discussion will be considered as a part of the final exam. They will also held a “simulation of experimental strategy” in which</p>

a question will be addressed experimentally, with discussion on methodology issues, stimulated by the Visiting Professor. Two or three practical sessions will be organized, in which the student will assist at real experiments in the laboratory.

**Lab activities**

The Visiting Professor will provide laboratory training on the analysis of histological sections of complex structures (craniofacial and reproductive system) and on the use of 3D reconstruction.

**Other activities besides the course: i.e. seminars and conferences addressed to PhD students and research fellows, dissemination conferences**

The Visiting Professor will give a minimum of three lectures to the whole department presenting recent advancements in topics related to the course.

**Visiting Professor Profile**

The candidate should have a Ph.D. degree or an MD degree or equivalent.

The candidate should have at least 10 years research experience, and currently have a group-leader position in research.

The candidate must have extensive and diverse experience in developmental biology research, particularly relevant to late morphogenetic processes and of the reproductive system, demonstrated by a consistent number (at least 10) of first-name or last-name peer review publications.

His / her training and work experience should enable him/her to contribute significantly to the teaching in the proposed classes, with a specific attitude towards experimental research in vitro and in animal models.

The candidate should be able to teach in fluent English.

**Contact person at the Department**

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