### Visiting Professors  
**Academic year 2018/2019**

#### 2nd term

<table>
<thead>
<tr>
<th>COURSE TITLE</th>
<th>Developmental Biology</th>
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<tbody>
<tr>
<td><strong>Scientific area</strong></td>
<td>Developmental Biology</td>
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<tr>
<td><strong>Department of</strong></td>
<td>Molecular Biotechnology and Health Sciences</td>
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<tr>
<td><strong>Language used to teach</strong></td>
<td>Italian and English</td>
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<td><strong>Teaching Commitment:</strong></td>
<td>16 hours</td>
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#### Course summary

*Development of the brain*

- Embryonic and Adult Neurogenesis (Migrazione neuronale)
- Neuronal and glial differentiation
- Neuritogenesis and axon elongation
- Axon guidance
- Selection, Competition, Pruning
- Synaptogenesis, Formation of networks
- Activity-dependent consolidation, dominance, plasticity

*Medical implications*

- Neuro-developmental disorders, examined from the point of view of molecular mechanisms, cellular and synaptic basis, effects on neural physiology, mouse models.
- Hints on cognitive disorders.

#### Learning objectives

Students will be exposed to fundamental concepts in developmental biology focusing on cell interactions, genetic determinants and signalling cascades at the basis of mammalian brain development, past the neural tube stage. They will learn about how the neuronal cell number and cell type is controlled in at least three main areas: the cortex, the hippocampus and the basal ganglia. They will learn neurons engage in initial cell-cell contact, and then in the formation of synaptic circuits. They will learn about the genesis, the properties and the plasticity of excitatory and inhibitory synapses. Although most of the teaching will be towards the comprehension of the basic and normal developmental mechanisms, links with developmental disorders will be illustrated and discussed in molecular, cellular and organizational terms. Students will be exposed to the scientific experimental approach whenever possible, so they will become confident on the hypothesis-driven approaches in experimental biology. They 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 Master students.
**Tutorship activities**

Students will be invited, as extracurricular activity and with no obligation, to present orally, shortly (15 min maximum) and in English their comprehension of a scientific article linked 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 evaluation. They will also hold a “simulation of experimental strategy” in which a question will be addressed experimentally, with discussion on methodology issues, stimulated by the Visiting Professor. These activities will be extended also to the students of the course Biology of Regeneration and Development (BIO/0175 Master Degree), which is the follow-up and extension of the Developmental Biology course.

**Lab activities**

No laboratory training is available for this course. The Visiting Professor will assist the students, together with the main lecturer Prof. Merlo in developing specific competences: 1) the interpretation of embryonic and adult brain structures, 2) the use of 3D reconstruction tools, 3) the examination of live fluorescent images.

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

The Visiting Professor will give two main lectures for the whole department, in English, presenting his/her recent advancements in topics related to the course. Student of the Developmental Biology course will attend as extracurricular activity, and will spend 1 hour after these for a question-answer session.

**Visiting Professor Profile**

The Visiting Professor should have an excellent publication record (at least 8) in developmental neurobiology and experimental neuroscience, should have strong familiarity with the mouse as experimental model, should be familiar with advanced 3D cellular models of brain development and ideally should successfully lead a team of young investigators. The Visiting Professor is expected to raise interest in the students, by illustrating first-hand approaches to basic questions in brain development.

**Contact person at the Department**

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