Testi del Syllabus

Resp. Did. | MERONI GERMANA | Matricola: 022803
Docenti | MALLAMACI ANTONIO, 3 CFU
         | MERONI GERMANA, 3 CFU
Anno offerta: | 2024/2025
Insegnamento: | 971SV - DEVELOPMENTAL NEUROGENETICS
Corso di studio: | SM75 - NEUROSCIENCE
Anno regolamento: | 2024
CFU: | 6
Settore: | BIO/18
Tipo Attività: | B - Caratterizzante
Anno corso: | 1
Periodo: | Secondo Semestre
Sede: | TRIESTE

Testi in italiano

Lingua insegnamento | INGLESE

Contenuti (Dipl.Sup.)

The course will address central nervous system embryonic development in vertebrate species, in particular mammals, at genetic, molecular and cellular levels. The contents of the course are illustrated here below.

- Early vertebrate development and body axes specification.
- Neural induction and specification.
- Central Nervous System patterning.
- Neural tube development and closure, and neural crest formation.
- Cerebellar histogenesis, development and compartmentalization.
- Human genetic disorders of cerebellar development and their mouse models.
- Rhombo-spinal domains development and specification.
- Elaboration of positional information along coordinate axes in the anterior brain anlage.
- Neocortical neuronogenesis. Articulation of neocortical glutamatergic neuronogenesis in rodents.
- Evolution of neocortical glutamatergic neuronogenesis and introduction to laminar identity specification.
- Neocortical astrogenesis: timing and molecular machineries controlling its progression.
- During the course, the experimental tools necessary for investigating the above topics will be also discussed.

Testi di riferimento

Material provided during the course as Lecture presentations and original research articles and reviews. This material will be available on the Microsoft Teams site dedicated to the course.


Obiettivi formativi

The aim of this course is to provide the KNOWLEDGE AND UNDERSTANDING (D1) of the nervous system organization through the study of the major events of brain and spinal cord embryological development, at the genetic, molecular and cellular level.
The course provides the instruments to understand the experimental genetic approaches that are necessary to undertake neurodevelopment studies (D2. APPLYING KNOWLEDGE AND UNDERSTANDING). In addition, students are encouraged to develop their critical reading of the scientific literature that will be proposed during the course (D3. MAKING JUDGEMENTS) and that will be tested during the final assessment. Teaching will be carried on stimulating the students to interact to improve their scientific language and to defend their ideas. The presence of an oral part in the final assessment is also intended to improve students’ Communication skills (D4. COMMUNICATION SKILLS). During the course, the students will be given the instruments to exploit the literature data and background together with experimental information in order to encourage their development as researchers (D5. LEARNING ABILITIES).

**Prerequisiti**

Basic knowledge of Molecular Biology, Cellular Biology and Genetics

**Metodi didattici**

Conventional lectures integrated with Journal clubs discussing seminal and recent research papers on neurodevelopmental genetics.

**Altre informazioni**

Any changes to the methods described here, that may be necessary to guarantee the application of the safety protocols linked to any emergency situations, will be communicated on the Department, Study Program and teaching website.

**Modalità di verifica dell'apprendimento**

Students will be required to take a final examination that consists of: i) a written part with 20 multiple choice questions concerning the entire programme of the course (in 1:30-hour-time); ii) a 20-30-minute oral interview to discuss both the written test, especially to judge the incorrect or partially incorrect answers (if any), as well as other topics addressed during the course. The final mark is assigned based on the average of the result of the written test and on the discussion during the oral part. To achieve the maximum score (30/30 cum laude), the student must demonstrate that he/she has acquired an excellent knowledge of all the topics covered during the course.

The verification methods are also explained by the teacher to the students during the presentation of the course in the first lesson and at the end of the course.

**Programma esteso**

The course will address central nervous system embryonic development in vertebrate species, in particular mammals, at genetic, molecular and cellular levels. During the course, the experimental tools necessary for investigating the above topics will be also discussed.

The course is given by prof. Germana Meroni and prof. Antonello Mallamaci; the contents of the course are illustrated here below.

- Early vertebrate development, from cleavage to gastrulation, and body axes specification.
The course will address central nervous system embryonic development in vertebrate species, in particular mammals, at genetic, molecular and cellular levels. The contents of the course are illustrated here below.

Early vertebrate development and body axes specification.

Neural induction and specification.

Central Nervous System patterning.

Neural tube development and closure, and neural crest formation.

Cerebellar histogenesis, development and compartmentalization.

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**Basic knowledge of Molecular Biology, Cellular Biology and Genetics**

**Conventional lectures integrated with Journal clubs discussing seminal and recent research papers on neurodevelopmental genetics.**

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- Early vertebrate development, from cleavage to gastrulation, and body axes specification.
- Genome editing, forward and reverse genetics, and lineage tracing tools.
This course explores topics closely related to one or more goals of the United Nations 2030 Agenda for Sustainable Development (SDGs). Specifically,
N.3 Health and wellbeing
N.4 Education of quality

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