

Doctoral School: **Biology Doctoral School**
Doctoral Program: Neuroscience and Human Biology

Subject code: **BIO/7/2**

Subject title: **Differentiation of neuronal cells L**

Teacher and Neptun code: **Dr. Madarász Emília (LLBFJT)**

Credits: 4

Class hours: 2 hours/week, lecture

Aim of the course

The presentation provides a detailed overview of the development of the central nervous system and its regulation at the level of tissues, networks, individual cells and molecules.

Course content

- The cellular composition of the central nervous tissue; Principles of the neural tissue organization
- Ontogenetic formation of the nervous system I. Regionalization along the body axes; role of “positional” genes
- Ontogenetic formation of the nervous system II. Segregation of distinct neural cell types
- Generation of neurons and glial cells; Activation of proneuronal and neural genes; stem-, progenitor and “resting” cells
- Cell migration in the developing neural tissue; Molecular bases of cell adhesion and cell motility
- The formation of layered and core-like neural structures
- Establishment of cellular polarity in developing neuronal precursors; process outgrowth
- Process elongation; the axon growth cone, pathfinding of neurites
- Process-elimination and maintenance: sorting for persisting neural fibres
- Synaptogenesis
- Activity-dependent synapse and neurite selection; Bioelectric activity in the developing neural tissue
- Trophic and growth factors in the formation and maintenance of synapses
- Development and regeneration: similarities and dissimilarities
- Diversity of neural stem cells

Requirements

written exam

Literature

lecture slides are available

