

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

Subject code: **BIO/7/4**

Subject title: **Neurochemistry L**

Teacher and Neptun code: **Dr. Világi Ildikó (GYVVCB), Dr. Borbély Sándor (EYBFOV)**

Credits: 4

Class hours: 2 hours/week, lecture

Aim of the course

The lecture provides a detailed overview of the overall function and communication of neurons with each other, discussing in detail the structure and function of different neurotransmitter systems.

Course content

1. Introduction. History of the subject, presentation of the main research methods
2. General characteristics of neuronal function I. Characterization of neuronal membrane function.
3. General characteristics of neuronal function II. Synapse structure and function.
4. General characteristics of neuronal function III. Characterization of intracellular signal transduction, regulation of calcium levels.
5. General characteristics of neuronal function IV. Introduction to the voltage-gated ion channel family.
6. Overview of each transmitter system I. The excitatory amino acid transmitter system.
7. Overview of each transmitter system II. The inhibitory, GABA-ergic transmitter system.
8. Overview of each transmitter system III. The cholinergic system.
9. Overview of each transmitter system IV. Biogenic amines.
10. Overview of Each Transmitter System V. Peptide Transmitters.
11. Overview of each transmitter system VI. Description of retrograde signalling.
12. Integrative functions of neurons. Changes in synaptic and cellular processes as a function of input activation.
13. Presentation of neuronal plasticity phenomena. Changes in communication between neurons during development and learning processes.
14. Diseases affecting the nervous system. Characteristics of neurodegenerative diseases. Epileptic activity.

Requirements

„A type” combined (oral and written) exam, 5-scale grading

Literature

Világi Ildikó - Tarnawa István, Neurokémia (textbook), Dialog Campus Kiadó, Pécs, 2013

slides are available in pdf

selected scientific papers

