INSTITUTE OF NEUROSCIENCE AND PHYSIOLOGY

SN00033  Neurochemistry I - Basic neurochemistry, 3 credits
Neurokemi I - Grundläggande neurokemi, 3 högskolepoäng
Third-cycle level / Forskarnivå

Confirmation
This syllabus was confirmed by the Council for PhD Education at Sahlgrenska Academy on 2019-03-29, and is valid from Autumn semester 2019.

Responsible Department
Institute of Neuroscience and Physiology, Sahlgrenska Academy

Entry requirements
Registered PhD students are eligible to be admitted to the course.

Learning outcomes
After completing the course the PhD student is expected to be able to:

Knowledge and understanding
- have a basic understanding of neurotransmitters, incl. amino acid based NT, neuropeptides, cannabinoids and other neuroactive substances
- have understanding of neurotransmitter metabolism
- have understanding of different receptors within neurotransmission as well as pre- and postsynaptic processes (exocytosis, endocytosis, secondary messenger systems)
- have knowledge on neurotoxic effects of different chemical species with focus on how these compounds affect the functionn of neurotransmitter signalling in neuronal circuits (eg. cocaine/dopamin transporter)
- understand general principles for the various neurochemical techniques and what kind of chemical changes can be studied with each of these

Skills and ability
- demonstrate understanding of important neurochemical processes and in particular neurotransmission
- demonstrate understanding of chemical properties of different neurotransmitters and how they are related within different signalling circuits in the nervous system
- demonstrate understanding of analytical techniques used in neurochemistry
- demonstrate the ability to relate analytical chemistry results to underlying neurochemical mechanisms
- retrieve, read and understand scientific literature
- present scientific own and others data to an audience.

Judgement and approach

Course content
The course aims to provide a concise theoretical background on neurochemical processes and methods. The course focuses on different neurotransmitters and the signalling circuits they are involved in in the brain. Here, the focus will be on pre and postsynaptic events in neuronal signalling and the associated molecular mechanisms.

Another central topic of the course will therefore be on methods in analytical neurochemistry to study synaptic mechanisms including mainly electro-physiological/-chemical techniques (amperometry, voltametry, patch clamp), invivo micro dialysis as well as mass spectrometry methods.

Types of instruction
The course will contain a mix of lectures, seminars, group work and lab demonstrations.

Language of instruction
The course is given in English.

Grades
The grade Pass (G) or Fail (U) is given in this course.

Types of assessment
Oral presentations, individual and as a group, followed by discussions with the whole class.
Home exam based on a literature project followed by individual presentation of the literature.
Oral examination of the content of both the literature presented and the content of the course.
A doctoral student who has failed a test twice has the right to change examiners, if it is possible.
A written application should be sent to the Institute.

Course evaluation
Anonymus written course evaluation following the course exam.

Other information

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Requested readings:
Course literature will provided within a compendium. Relevant references including review articles will be provided.