Module Name
Neuropeptidomes of insects (Elective Module)

Type of Module	**Module Code**
o Supplementary Module	Neuropeptidomes

Identification Number	**Workload**	**Credit Points**	**Term**	**Offered Every**	**Start**	**Duration**
MN-B-EM 5	120 h	4 CP	1st, 2nd, 3rd, 4th term of studying	Winter and summer term	Every term	3 weeks

1	**Course Types**	**Contact Time**	**Private Study**	**Planned Group Size***
	a) Lectures	12 h	14 h	max. 5
	b) Practical	50 h	30 h	max. 5
	c) Seminar	6 h	8 h	max. 5

2 Module Objectives and Skills to be Acquired

Students who successfully completed this module

- Will learn the procedure for the identification of neuropeptides in the central nervous system of insects using up-to-date methods:
  - Insect neuropeptides
  - Dissections of insect central nervous system (CNS)
  - RNA and protein extractions
  - Transcriptome analysis
  - Orbitrap mass spectrometry
  - Peptidome analysis
- are able to transfer skills acquired in this module to other fields of biology.

3 Module Content

The course will involve introduction to neuropeptides, wet lab hands-on and bioinformatic analysis. Each student will analyse the neuropeptidome of a single insect species combining RNA sequencing and proteomic analysis. The typical peptidomic work flow consists in:

1) Dissecting the CNS of the insect species.
2) Extracting RNA and proteins from the CNS tissues (WET-LAB).
3) Assembling short RNA reads (BIOINFORMATIC).
4) Searching for gene sequences in transcriptome assembly (BIOINFORMATIC).
5) Identifying neuropeptides in the whole proteome (BIOINFORMATIC).

Finally, the results will be discussed with the other students in order to identify similarities and differences among the neuropeptidomes of species belonging to different insect orders.

4 Teaching Methods

Lectures; Seminar; Practical/Lab (Project work); Bioinformatics

Neuropeptidomes of insects (MN-B-EM 6) continued

5	**Prerequisites (for the Module)** Enrolment in the Master´s degree course “Biological Sciences” Previous experience with insect dissection is preferable
6	**Type of Examination** Oral presentation of the methods and main results of the project
7	**Credits Awarded** Regular and active participation; Passed examination
8	**Compatibility with other Curricula** None
9	**Proportion of Final Grade** Not applicable (pass or fail)
10	**Module Coordinator** Dr. Lapo Ragionieri, phone 470-8592, e-mail: lapo.ragionieri@uni-koeln.de
11	**Further Information** **Elective module** of the Master´s degree course “Biological Sciences”, **Literature:** • Ragionieri, L., Verdonck, R., Verlinden, H., Marchal, E., Vanden Broeck, J., Predel (2022), R. Schistocerca neuropeptides – An update. Journal of Insect Physiology. https://doi.org/10.1016/j.jinsphys.2021.104326 • Ragionieri, L., and Predel, R., 2020. The neuropeptidome of Carabus (Coleoptera, Adephaga: Carabidae). Insect Biochemistry and Molecular Biology, 118 103309 https://doi.org/10.1016/j.ibmb.2019.103309 **General time schedule:** March 27 to April 14, 2023 **Note:** If possible, students should bring their own computer. **For registration, students should contact the module coordinator by e-mail until February 15th 2023.**

* Minimum group size is 2 students.