

Blockkurs “Developmental Biology and Neuroscience”

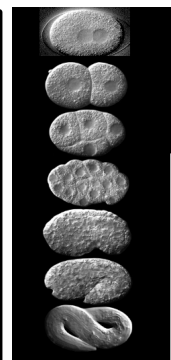
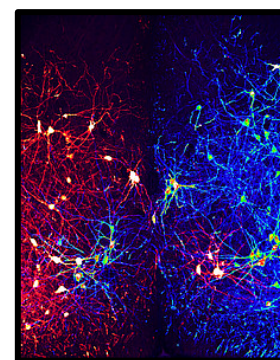
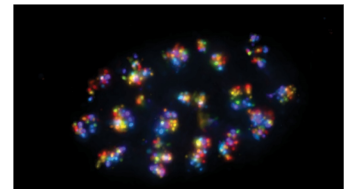
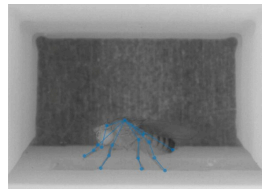
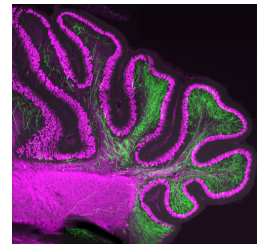
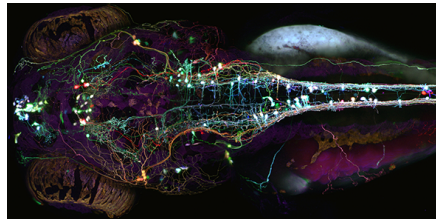
Duration: 6 weeks; 15 credit points

When: first half of spring term; 3rd year

Goal: The aim of the Developmental Biology and Neuroscience Course is to learn about current topics in these fields, and to gain first-hand experience in state-of-the-art experimental methods in different model organisms. The course consists of introductory lectures covering different research topics, practical experimental sessions and data analysis.

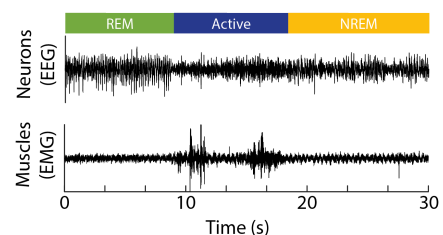
Topics include:

- Stem cells
- Cell differentiation
- Organ and cell development
- Cell lineage, identity and plasticity
- Cell signalling
- Imaging structure and function
- Connectivity in the brain and spinal cord
- Dynamics and plasticity in the brain
- Sensory and motor processing
- Biology of the Neuromuscular system
- Coding and decoding neuronal activity
- Biological substrates of cognitive functions
- Brain-Machine Interfaces and Artificial Neural Networks



Laboratory experience:

- Immunostaining, tissue dissection, cell cultures
- Fluorescence microscopy
- Live imaging *in vivo*
- Genetic analysis
- CRISPR mutagenesis
- PCR, genotyping, enzyme assays
- Quantitative data and image analysis
- Gene expression analysis: qPCR, bioinformatic approaches including single-cell RNA-seq analysis
- In silico analysis of gene expression and brain connectivity
- Recording and analyzing neural activity
- Quantitative analysis of behaviour



Additional skills:

- Data analysis, scientific writing and presentation
- Reading, interpreting, and critically assessing scientific literature

The course lasts six weeks (compulsory attendance), followed by two weeks for exam preparation.

Language: English

Lecturers: Silvia Arber, Gray Camp, Fiona Doetsch, **Flavio Donato**, **Anissa Kempf**, Susan Mango, Pawel Pelzcar, Peter Scheiffele, Alex Schier

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