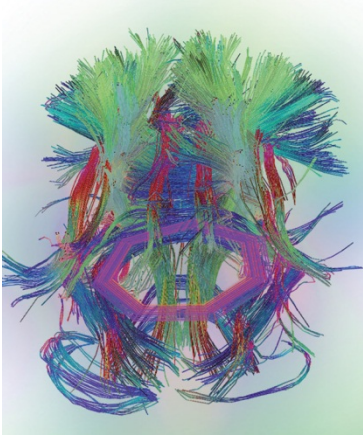




ÉCOLE POLYTECHNIQUE  
FÉDÉRALE DE LAUSANNE



The PhD Program in Neuroscience comprises a combination of coursework, laboratory based research, in-house seminars, and national or international conferences, providing its students with training in **neural sciences** ranging from the genetic to the behavioural level including molecular, cellular, cognitive, computational neuroscience and neuroprosthetics.

There is close cooperation between our program and the Neuroscience programs of the Universities of Lausanne (UNIL) and Geneva (UNIGE)

## More about our PhD Program

\*\*\*

~ 75 PhD students

\*\*\*

### The Program Commission

Director, Prof Michael Herzog

Deputy Director, Prof. Ralf Schneggenburger

Prof. Grégoire Courtine  
Prof. Wulfram Gerstner  
Prof. Diego Ghezzi  
Prof. Johannes Gräff  
Prof. Sean Hill  
Prof. Carl Petersen  
Prof. Carmen Sandi  
Prof. Felix Schürmann

\*\*\*

### Program Administrator

Alice Goodman  
edne@epfl.ch



# PhD Program in Neuroscience

## Affiliated Faculty

### **Aebischer, Patrick** - Study of Neurodegeneration

Gene therapy, animal models, Parkinson's disease, Amyotrophic lateral sclerosis, Alzheimer's disease, viral vectors, cell encapsulation, RNA interference

### **Barrandon, Yann** - Stem Cell Dynamics

Stem cell, morphogenesis, microenvironment, reprogramming, regenerative medicine, cell & gene therapy

### **Blanke, Olaf** - Cognitive Neuroscience

Body perception, self consciousness, intracranial human electrophysiology, neuroimaging, neuro-psychology, neurology, virtual reality technology

### **Courtine, Grégoire** - Motor control & Neuroprosthetics

Spinal cord injury, locomotion, neuroprosthetics, robotics, anatomical plasticity, electrophysiology

### **Gastpar, Michael** - Information in Networked System

Statistical Neuroscience, Information Measures, Signal Processing

### **Gerstner, Wulfram** - Computational Neuroscience

Computational neuroscience, models of spiking neurons, models of synaptic plasticity and STDP, models of learning

### **Ghezzi, Diego** - Neuroengineering for Vision Restoration

Neuro-optoelectronic interfaces, visual prosthesis, optical stimulation, nanofabrication, polymers, neuroprosthetics, biocompatibility, visual system, sight restoration, sensory perception, artificial photoreceptors

### **Gräff, Johannes** - Neuroepigenetics

Epigenetic mechanisms in long-term memory, PTSD, neurodegeneration, stress and epigenetics

### **Gruetter, Rolf** - Center for Biomedical Imaging

Magnetic resonance imaging, PET, MR spectroscopy, *in vivo* neurochemistry, hypoglycemia

### **Herzog, Michael** - Vision

Vision, spatio-temporal vision, schizophrenia research, psychophysics, TMS, EEG, modelling

### **Hess, Bellwald Kathryn** - Topology and Neuroscience

Applications of topology in neuroscience, multi-scale analysis of the structural and functional connectomes

### **Hill, Sean** - Thalamocortical Computation & Blue Brain Project

Thalamocortical structure & function, models of wakefulness & sleep, neuromodulation, simulated TMS and EEG, integrated information

### **Ijspeert, Auke** - Motor Control & Robotics

Models of animal locomotion control, central pattern generator networks, robots as scientific tools in neuroscience

### **Lashuel, Hilal** - Molecular Neurobiology & Functional Neuroproteomics

Neurodegeneration, protein misfolding, protein engineering, Parkinson's disease, Alzheimer's disease

### **Magistretti, Pierre** - Neuroenergetics & Cellular Dynamics

Neuroenergetics, neuron-glia interactions, brain metabolism, neuronal plasticity, cellular imaging, digital holographic microscopy, functional brain imaging

### **Markram, Henry** - Neural Microcircuitry & Blue Brain Project

Reverse engineering of neocortex, multi-unit patch clamp electrophysiology, computational neuroscience, IBM BlueGene super-computing facility

### **McCabe, Brian** - Molecular and Cellular Neuroscience

Neurogenetics, synapse and circuit development and function, synaptic plasticity, locomotion behaviour, models of neurodegenerative disease

### **Micera, Silvestro** - Translational Neural Engineering

Neural control of movement, implantable neuroprostheses, robot-based neuro-rehabilitation

### **Millán del R., José** - Brain-machine Interfaces

Neuroprosthetics, Statistical machine learning, Human-robot interaction, Cognitive neuroscience

### **Petersen, Carl** - Sensory Processing

Whisker behaviour, sensory perception, barrel cortex, cortical circuits

### **Sandi, Carmen** - Behavioral Genetics

Learning and memory, stress and memory, emotion, neural plasticity, neural cell adhesion molecules, glucocorticoids, animal models of psychiatric disorders

### **Schneggenburger, Ralf** - Synaptic Mechanisms

Synaptic transmission, short-term plasticity, nerve terminal, degeneration, patch-clamp electrophysiology, cellular Ca<sup>2+</sup> imaging, Ca<sup>2+</sup> uncaging

### **Schürmann, Félix** - Neurosimulation Technology & BBP

*In silico* neuroscience, simulation, scientific computing

### **Thiran, Jean-Philippe** - Image Processing and Analysis

Image segmentation, multimodal fusion, MRI, quantitative imaging, diffusion MR processing, connectomics

### **Van de Ville, Dimitri** - Medical Image Processing

Computational Neuroimaging functional MRI, signal processing, brain decoding, connectivity, networks, dynamics

### **Schorderet, Daniel** - Genes and vision

IROVISION « <http://irovision.ch> »  
Identifying and understanding the genes implicated in the development and the function of the eye

### **Rainer, Gregor** - Visual Cognition

University of Fribourg « <http://www.unifr.ch/inph/vclab> »  
Visual Neuroscience, Laminar cortical computations, Primary visual cortex, Visual awareness, Electrophysiology, Attention, Cholinergic Neuromodulation

## Selection of courses taught in English (2016 – 2017)

- Introduction to practical aspects of animal experimentation and animal facilities
- Neuroscience and Neurophysiology
- Brain Bioenergetics
- Synaptic mechanisms in hearing
- Neurophysiology for Neural and Biomedical Engineering – Summer School 2016
- Statistics and Neuroscience upgrade courses (Master)



The EPFL campus, in Lausanne, on the shores of Lake Geneva (Switzerland)

**Application deadlines**  
May 1 and November 15

[phd.epfl.ch/neuroscience-openings](http://phd.epfl.ch/neuroscience-openings)