Department of Neuroscience

 # Neurosciences
 # Regenerative medicine
 # Alzheimer's chicken, Huntington's disease
 # Fluorescence microscopy
 # EVOS

Offer

- Meaurement of ion concentrations and the extracellular volume and tortuosity *in situ* and *in vivo* using ion-selective microelectrodes
- Measurements of biopotentials in the living tissue
- Fluorescence microscopy of cell cultures and tissue samples
- Image analysis including 3D morphometry

Know-how & Technologies

- Our research focus is aimed at the changes of the extracellular space diffusion parameters, extrasynaptic (volume) transmission and neuron-glia interaction during physiological and pathological states.
- Furthermore we study stem cells and biomaterials in regenerative medicine.
- We use various animal models of pathological states, e. g. models of global and focal ischemia, Alzheimer's disease, Huntington's disease, tumors, epilepsy, developmental disorders, aging, and brain and spinal cord injury.

Team Members

- Prof. Nathalie Rouach, CIRB, College de France, DR2 Inserm, Paris, France
- Prof. Brigitte Onteniente, INSERM UMR 861, 91030 Evry cedex, France
- Prof. Meenou Jhanwar-Uniyal, New York Medical College, New York, USA. Mutual grant from a program Kontakt II LH12024

Key Research Equipment

The department is equiped with high technicaly advanced electrophysiological setups allowing measurements of various biopotencials, extracellular ion concentrations and the extracellular space diffusion parameters by a unique real-time iontophoretic method. It posses also several fluorescent microscopes for histological evaluation of samples and image analysis, including a new digital inverted fluorescence microscope EVOS.

Selected Publications

- Forostyak S, Homola A, Turnovcova K, Svitil P, Jendelova P, Sykova E. (2014) *Intrathecal Delivery of Mesenchymal Stromal Cells Protects the Structure of Altered Perineuronal Nets min SOD1 Rats and Amends the Course of ALS*. Stem Cells. 32(12):3163–72
- Vargova L, Sykova E. (2014) *Astrocytes and extracellular matrix in extrasynaptic volume transmission.* Philos Trans R Soc Lond B Biol Sci. 369(1654):20130608
- Morawski M, Filippov M, Tzinia A, Tsilibary E, Vargova L. (2014) *ECM in brain aging and dementia.* Prog Brain Res. 214:207–27
- Anderova M, Vorisek I, Pivonkova H, Benesova J, Vargova L, Cicanic M, Chvatal A, Sykova E.: (2011) *Cell death/proliferation and alterations in glial morphology contribute to changes in diffusivity in the rat hippocampus after hypoxia-ischemia*. J. Cereb. Blood Flow Metab. 31(3):894–907
- Pannasch U,. Vargova L, Reingruber J, Ezan P, Holcman D, Giaume C, Sykova E, Rouach N.: (2011) *Astroglial networks scale synaptic activity and plasticity.* Proc Natl Acad Sci U S A. 108(20):8467–72
- Bekku Y, Vargova L, Goto Y, Vorisek I, Dmytrenko L, Narasaki M, Ohtsuka A, Fasler R, Ninomiya Y, Sykova E, Oohashi T: (2010) *Bral-1: its role in diffusion barrier formation and conduction velocity in the CNS*

Are you interested in this expertise?

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Experts and their Department

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Klíčová slova

 # Neurovědy
 # Regenerativní medicína
 # Alzheimerova chroba, Huntingtonova choroba
 # Flurorescenční mikroskopie
 # EVOS