

# Neuroplasticity: In search for cellular mechanisms underlying changing cognition using imaging

## Organizers:

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It is common knowledge that the brain constantly adapts to new challenges by reshaping its structure in order to carry out new functions. These changes were seen for a long time at the level of the synapse, but a paradigm shift has point more towards changes at the macro scale of brain networks. Changes in gray and white matter are observable after skill learning or at the basis of disease, but its mechanisms are still widely unknown. Bogdan Draganski will provide us insights into the validation of imaging methods with quantitative MRI, trying to reach a more comprehensive understanding of plasticity and its underlying mechanisms. Alfred Anwander will show how a long-lasting new cognitive challenge, learning a new language, can be tracked by studying both structure and function and trying to establish causal relationships in brain change. Brian Wandell will use the visual system and reading as a starting point to understand how and where plasticity happens in the human brain, in particular trying to understand how long certain brain areas are able to adapt to new input. Finally, R. Douglas Fields will give us an insight of the micro scale, bridging the gap between insights coming from brain imaging and recent finding in the molecular biology of the nervous system.

## Symposia Schedule:

8:00-8:15

### **In vivo studies of use-dependent brain tissue property changes**

*Bogdan Draganski, LREN, CHUV, Lausanne, Switzerland*

8:15-8:30

### **Longitudinal multimodal plasticity: Combining structural connectivity, quantitative MRI and fMRI when learning a language**

*Alfred Anwander, Max Planck Institute for Human Cognitive and Brain Sciences, Leipzig, Germany*

8:30-8:45

### **Assessing plasticity and development in the visual pathways of individual subjects with quantitative methods**

*Brian Wandell, Stanford University, Stanford, CA, United States*

8:45-9:00

### **Cellular mechanism of brain network plasticity: The role of myelin and glia**

*R. Douglas Fields, Ph.D., National Institutes of Health, Bethesda, MD, United States*

9:00-9:15

### **Questions and Answers**