

Real-time fMRI neurofeedback as a tool to promote cognition in old age

Tuesday October 18th 11:10-12:30 am; New Haven Lawn Club: Ballroom

Chairs: Jessica Peter¹, Lars Michels²

¹ University Hospital of Old Age Psychiatry and Psychotherapy, University of Bern, Bern, Switzerland

² Department of Neuroradiology, University Hospital Zurich, Zurich, Switzerland

As people age, many cognitive abilities decline with memory impairment becoming very common. Age is also the main risk factor for developing dementia, in particular Alzheimer's disease. Until novel disease modifying compounds become available, non-pharmacological interventions to prevent, or slow, memory decline need to be another major focus of research. Real-time fMRI neurofeedback can have potential for improving memory functions but very few studies so far have tried to use this method to regulate regions relevant for memory itself. Another, more indirect, approach may be to modulate regions involved in attention since attention determines what will later be remembered or forgotten. Therefore, in this symposium, we will present studies that have used neurofeedback to regulate regions associated with attention or memory. We will start the session with a theoretical talk by Arnold Bakker on hippocampal hyperactivity in aging and disease that also covers potential target regions for neurofeedback to reduce that hyperactivity. Katharina Klink will then present a study in which healthy adults or patients with amnesic Mild Cognitive Impairment regulated hippocampal activity to improve memory. Tian Lin will follow to present a study in which healthy adults regulated activity in the anterior cingulate cortex to enhance selective attention. Finally, Lars Michels will present a study in which healthy adults regulated activity in the insula to enhance attention.

11:10am: Arnold Bakker, PhD, John Hopkins University, Baltimore: Hippocampal hyperactivity in aging and disease: A target for intervention

11:30am: Katharina Klink, PhD, University of Bern: Reducing hippocampal hyperactivity with real-time fMRI neurofeedback

11:50am: Tian Lin, PhD, University of Florida: Real-Time fMRI Neurofeedback Training of Selective Attention in Older Adults

12:10pm: Lars Michels, PhD, University of Zurich: Investigating attention and visual brain processing through real-time fMRI neurofeedback