BioTechMed-Graz

Biomedical Basics - Technological Developments - Medical Implementation

Research for Health
Representative

- Prof.Dr. Franz Fazekas, MUG and team
  - stroke, small vessel diseases of the brain, multiple sclerosis, aging of the brain, neurorehabilitation
Representative

• Prof. Dr. Anja Ischebeck, KF UNI & colleagues
  – cognitive and affective neurosciences, number and language processing, learning, emotion, research using functional imaging and brain stimulation
Representative

• Prof. Dr. Gernot Müller-Putz, TUG
  – Brain-Computer Interfacing for communication (e.g., disorders of consciousness), control (neuroprosthetics), functional brain mapping, motor system, neurorehabilitation
Current Situation

• **Existing, quite successful collaboration** between the three universities in the neurosciences
  
  – Research on **neuronal plasticity** and **functional compensation** of the brain during development and aging and in the context of neurologic diseases
  
  – Research into **cognitive and affective neurosciences** with functional imaging and brain stimulation
  
  – Development of a new method for communication and control (**Brain-Computer Interface, BCI**) for individuals with severe motor disabilities, including neurofeedback and neurorehabilitation
Current Situation

• Broad spectrum of methods and devices
  – Morphological and functional magnetic resonance imaging (two 3T MRT)
  – Electrophysiological methods (EEG, EP)
  – Non-invasive brain stimulation (TMS, tACS, tDCS)
  – Functional near-infrared spectroscopy (fNIRS)
Current Situation

• High regional, national and international visibility
  – Initiative Gehirnforschung Steiermark (INGE St)
  – Publications in high and very high ranked *peer-reviewed* journals
  – Third party funding (e.g., FP7/H2020 EU Projects, FWF Projects)
Goals

• Structural and functional MRI studies (fMRI) for neuronal plasticity and functional repair/compensation and broadening of the topics of learning and competence preservation in aging

• Development and evaluation of new rehabilitation techniques based on EEG, functional near-infrared spectroscopy, fMRI and non-invasive brain stimulation

• Development of a Brain-Data-Bank (focus: quantitative morphometry, functional cerebral networks) in healthy individuals and neurological disease
Goals

• Clinical and epidemiological, genetic and biochemical investigations of \textit{molecular fundamentals} of neurologic and psychiatric diseases with respect to new treatment strategies

• \textbf{Translational Research in the animal model} (genetic, neurophysiological, behavioral, imaging methods)
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