



CHARACTERIZATION AND RESCUE OF NEURONAL DYSFUNCTION

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Towards precision medicine: patient-tailored treatment strategies to enhance motor recovery

Stroke is one of the leading causes of long-term disability, especially motor disabilities impact significantly on daily life activities and the return to normal work and private life. Advanced neuro-technological solutions exploiting for example BCI, brain stimulation, robotic or peripheral stimulation systems can increase the efficacy of stroke rehabilitation with promising results. However, the treatment results are still limited in magnitude and heterogenous advocating for a conceptual change from ‘one-suits-all’ treatment strategies, as applied currently, towards personalized, individual patient-tailored concepts. Such a paradigm shift and “evolutionary” change can occur only done by detailed understanding of natural stroke recovery and neurorehabilitation. To design personalized interventional strategies based on neurotechnology, it is necessary to have also an excellent understanding of the mechanisms determining the effectiveness of a treatment in the heterogeneous population of stroke patients and to determine biomarkers allowing to predict outcome and treatment response for patients’ stratification and to tailor treatment. The present talk will summarize current neurotechnology-based interventions, their underlying mechanisms of actions and highlight their current limitations. In parallel, it will discuss current approaches for phenotyping based on multimodal systems neuroscience and provide an outlook how personalized patient-tailored interventional strategies based on neurotechnology could enter the field of daily clinical life, especially neurorehabilitation.

