Personalized Medicine: Review and Perspectives of Promising Baseline EEG Biomarkers in Major Depressive Disorder and Attention Deficit Hyperactivity Disorder.

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Abstract
Personalized medicine in psychiatry is in need of biomarkers that resemble central nervous system function at the level of neuronal activity. Electroencephalography (EEG) during sleep or resting-state conditions and event-related potentials (ERPs) have not only been used to discriminate patients from healthy subjects, but also for the prediction of treatment outcome in various psychiatric diseases, yielding information about tailored therapy approaches for an individual. This review focuses on baseline EEG markers for two psychiatric conditions, namely major depressive disorder and attention deficit hyperactivity disorder. It covers potential biomarkers from EEG sleep research and vigilance regulation, paroxysmal EEG patterns and epileptiform discharges, quantitative EEG features within the EEG main frequency bands, connectivity markers and ERP components that might help to identify favourable treatment outcome. Further, the various markers are discussed in the context of their potential clinical value and as research domain criteria, before giving an outline for future studies that are needed to pave the way to an electrophysiological biomarker-based personalized medicine.