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Review

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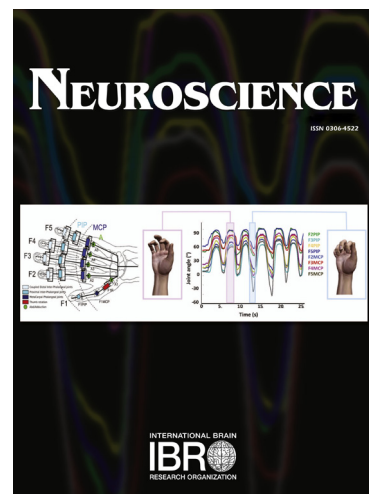
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Resting-State Abnormalities in Heroin-Dependent Individuals

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Abstract

Drug addiction is a major health problem worldwide. Recent neuroimaging studies have shed light into the underlying mechanisms of drug addiction as well as its consequences to the human brain. The most vulnerable, to heroin addiction, brain regions have been reported to be specific prefrontal, parietal, occipital, and temporal regions, as well as, some subcortical regions. The brain regions involved are usually linked with reward, motivation/drive, memory/learning, inhibition as well as emotional control and seem to form circuits that interact with each other. So, along with neuroimaging studies, recent advances in resting-state dynamics might allow further assessments upon the multilayer complexity of addiction. In the current manuscript, we comprehensively review and discuss existing resting-state neuroimaging findings classified into three overlapping and interconnected groups: functional connectivity alterations, structural deficits and abnormal topological properties. Moreover, behavioral traits of heroin-addicted individuals as well as the limitations of the currently available studies are also reviewed. Finally, in need of a contemporary therapy a multimodal therapeutic approach is suggested using classical treatment practices along with current neurotechnologies, such as neurofeedback and goal-oriented video-games.

Keywords: Heroin addiction, resting-state, functional and structural connectivity, small-world properties, behavioral traits of heroin-dependent individuals.

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