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Functional connectivity in subjects with substance use disorders: a meta-analysis of functional neuroimaging studies**Stephane Potvin***University of Montreal, Canada*

Background In the past decades there has been a growing number of functional connectivity studies examining brain deficits in individuals with addiction. While there is an extensive literature suggesting the major role of the brain reward pathway across substance use disorders, the role of other neural pathways remains unclear. Furthermore, little is known about shared and/or specific deficits in brain connectivity between these disorders. Methods A coordinate-based meta-analysis was executed that aimed to examine common and specific functional connectivity alterations across substance use disorders. A total of 96 studies were included, encompassing alcohol, nicotine, cannabis and stimulant use disorders. Results Across substances, connectivity deficits were observed between ventral striatum and perigenual anterior cingulate cortex, between dorsal striatum and Brodmann areas 6/8, as well as between orbitofrontal cortex and the amygdala. Furthermore, we found that cannabis misuse was associated with increased connectivity within the inferior parietal lobule, whereas nicotine misuse was linked with decreased connectivity in the ventral striatum. Finally, cocaine and alcohol addiction were both related with dysconnectivity in the ventromedial prefrontal cortex, but showed opposite direction, namely increased and decreased connectivity, respectively.

Conclusion In this meta-analysis, we observed that substance use disorders were characterized by shared deficits between brain reward nodes and regions involved in affective processing and cognitive control. Additionally, we observed potentially specific brain targets between type of substance. In sum, these results are critical for our understanding of neural mechanisms underlying addiction.

Biography

Stephane Potvin is full-time professor at the Department of Psychiatry and Addiction of University of Montreal (Canada). He is coordinator of the Neuroscience and Mental Health Axis of the Centre de recherche de l'Institut Universitaire en Santé Mentale de Montréal. Since 2014, Dr Potvin is holder of the Eli Lilly Canada Chair on schizophrenia research. Dr Potvin is author of more than 200 scientific articles, including publications in prestigious journals such as American Journal of Psychiatry and Biological Psychiatry.

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