Neuropsychiatry and substances effects on brain and behavior

Substance effects on the brain is often linked to substance use disorder (SUD) a maladaptive pattern of conditions in which the use of substances leads to clinically and functionally significant impairment or distress. Besides, it is not uncommon that SUD co-occur with other neuropsychiatric conditions. These altogether generate challenges for precision medicine as the substances effects on brain and behavior is very complex. For example, the seductive experience of euphoria, the experience of extreme pleasure is the one to link with the SUD yet our knowledge about the euphoric brain is very limited. This is not surprising when considering the fact that the neuroanatomy of pleasure is quite complex as it is related to an array of complex behaviors ranging from “anticipation and desire to sensation and satisfaction”. Moreover, the pleasure itself does not seem to be the major drive for the compulsive substance use once the brain gets addicted. SUD pose a heavy societal burden, endangering the health and well-being of individuals and their families, and presenting daunting challenges in prevention and treatment. On the other hand fueled with new generation of magnetic resonance imaging tools with a power reaching to 7 Tesla and armed with the tools of omics technologies, today’s new interdisciplinary experimental designs bring the research into new avenues by which the connections can be made to better understand the addictive brain and its manifestations.

Our goal is to bring together clinicians and researchers to stimulate research and strengthen the knowledge and expertise to combat the consequences of mental illness and substance use and misuse, to provide the reader with a wide overview of current knowledge in the field of substances effect on brain and behavior and the application of novel molecular, cellular, animal and clinical experimental strategies to explore the issue with integrative focus in the context of structural/functional neuroimaging, deep brain stimulation, genomics, for example. Besides, to facilitate the precision medicine, investigations with translational potential such as longitudinal studies with innovative methods to guide the development of novel biomarkers for treatment decision are particularly encouraged. We welcome contributions from the behavioral and brain sciences that explore the neuroscientific mechanisms that modulate individual responses to drugs and support positive treatment outcomes. The special issue encompasses all types of addictive disorders, including substance use disorders (e.g., alcohol, cannabis, stimulants, opioids, nicotine) and behavioral addictions (e.g., gambling).

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Guest Editor:
Pro. Dr. Gustavo Gonzalez-Cuevas
Department of Biomedical and Pharmaceutical Sciences, College of Pharmacy, Idaho State University, USA.
gonzgust@isu.edu

Gustavo Gonzalez-Cuevas

Prof. Ayla Arslan
Genetics and Bioengineering, Faculty of Engineering and Natural Sciences, International University of Sarajevo, Hrasnička cesta br. 15, 71210 Ilidža - Sarajevo, BiH.
aarslan@ius.edu.ba

Ayla Arslan

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Rm. 19C, Lockhart Ctr., 301-307 Lockhart Rd., Wan Chai, Hong Kong.