

The Neural Mechanisms of Psychedelic Drug Action - Talk 4

Speaker: Dr. Javier González-Maeso - Virginia Commonwealth University

Title: Molecular target and mechanisms of psychedelic-induced plasticity

Venue: Institute of Theoretical Biology, Philippstr. 12, Haus 4, Hörsaal 4, Berlin 10115, Germany

<https://goo.gl/maps/uBEkAEksdoxK89ua6>

Date: Thursday, 29.06.2023

Time: 17:00

Zoom Link (hybrid event): <https://hu-berlin.zoom.us/j/62736858319>

Abstract: Clinical evidence suggests a potential therapeutic effect of classical psychedelics for the treatment of depression. The most outstanding and distinct characteristic is the rapid and sustained antidepressant action with one single exposure to the drug. However, the biological substrates and key mediators of psychedelics' enduring action remain unknown. Our current data suggest that a single administration of the psychedelic DOI produced fast-acting effects on mouse frontal cortex dendritic spine structure and acceleration of fear extinction via the serotonin 5-HT_{2A} receptor. Additionally, a single dose of DOI led to changes in chromatin organization particularly at enhancer regions of genes involved in synaptic assembly that stretched for days after the psychedelic exposure. DOI-induced alterations in neuronal epigenome overlapped with genetic loci associated with schizophrenia, depression and attention deficit hyperactivity disorder. Together, these data support the notion that epigenetic-driven changes in synaptic plasticity operate as the mechanistic substrate of psychedelic's long-lasting antidepressant action but also warn on the limitations in individuals with underlying risk for psychosis. If generalizable to other psychedelics currently in clinical studies, these findings could also facilitate the understanding of psychopharmacological interventions whose mechanisms of action are not fully defined.

Yours sincerely from the organizing team,

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