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The Effect of Serotonin Receptor Manipulation On Brain Networks and Its Impact On Emotion Regulation

R. Krähenmann¹

¹Neuropsychopharmacology and Brain Imaging, University of Zurich, Zurich, Switzerland

New title, or subtitle: „Current knowledge on the neurobiology of classical hallucinogens and their relevance for the treatment of mood and anxiety disorders’

Hallucinogenic substances have been used for millenia. Still, the scientific investigation into the effects and mechanisms of classical hallucinogens in humans has only commenced with the discovery of LSD by Albert Hofmann in 1943. In the 1960’s, there were more than a thousand clinical studies that reported promising therapeutic effects of LSD and psilocybin in psychiatric patients. Only recently, however, the neuropharmacological and neurobiological underpinnings of hallucinogenic drugs have undergone systematic investigations. Despite having different chemical structures, classical hallucinogens produce striking similar subjective and behavioral effects in both animals and humans. Activation of the serotonin 2A (5-HT_{2A}) receptor is a core feature in hallucinogenic pharmacology. Recent neuroimaging studies have begun to elucidate the brain mechanisms underlying hallucinogen-induced changes of thought, perception, and mood. Among the many networks involved in hallucinogen-related states of consciousness, the prefrontal cortex and the limbic regions appear to be especially relevant to the putative antidepressant effects of classical hallucinogens. Furthermore, hallucinogens may foster neuroplastic adaptations within cortico-subcortical brain networks. This appears to be a promising mechanism with regard to future clinical studies into the effects of classical hallucinogens in depression and anxiety.