

Reports from the last decade suggest that psychedelic drugs have psychotherapeutic potential in treatment of depression, substance misuse and death-related anxiety in terminally ill. Studies had shown that psychedelic drugs are able to induce long-term improvement in well-being, relationships, sense of purpose in healthy individuals as well. Intensity of mystical experience induced by psychedelic drugs can affect degree of the psychedelic-induced long-term changes. Mystical experience consists of feeling of connection with world and others, disintegration of self-boundaries and personal insight. Psychedelic experience is accompanied by changes in default-mode network (DMN) functioning. Default-mode network is a set of brain structures which are engaged in processing of self-related stimulus, memory retrieval and future planning. Despite growing number of studies on psychedelic-induced changes in DMN, little is known about functioning of DMN in individuals using psychedelic in non-supervised laboratory environment.

The aim of the proposed study is to examine neural and psychological differences between psychedelic drugs users and psychedelic naive participants. Especially we are curious whether psychedelic drugs users will differ in terms of processing of self-related thoughts and whether this difference will be observable on neural level. Negative thoughts regarding one's self (rumination) are related to depression, anxiety and self-harm. Moreover, rumination was shown to predict depression onset. We will apply rumination induction procedure and using electroencephalogram will explore differences in DMN activity in response to rumination induction. Given that psychedelic experience is related to changes in self-perception and self-boundary disintegration, we suggest that individuals using psychedelic drugs could be more immune to rumination induction what could be reflected in lower DMN activation after rumination induction.

We believe that proposed study will significantly contribute to scientific knowledge on psychedelic drugs action and long-term effects, neural basis of ruminative thinking and DMN functioning measured with EEG. Studying psychedelic-induced changes in processing of self-related information can expand our understanding of mechanisms underlying integration of the information in a self-centred reality model (Metzinger, 2004) not only in psychedelic states but also during normal functioning. Furthermore, better understanding of psychological and neuronal mechanisms underlying psychedelic effects would be beneficial in order to reliably establish psychedelic usefulness and safety both as adjunct in psychotherapy and as a preventive tool, able to improve quality of life, wellbeing and better emotion regulation of healthy individuals. Last, but not least, we aim to enrich the body of research on real risks associated with psychedelic drugs use in non-controlled settings, this could fulfill harm-reduction practices and provide basis to elaborate more adequate and evidence-based solutions regarding psychedelic drugs legal status.