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The role of the ketamine-induced dissociated state in the treatment of neuropsychiatric disorders

Abstract

The brain can become transiently disconnected from the surrounding environment while maintaining internally generated experiences, so called 'dissociated state,' under severe stress, trauma, psychiatric disorders, epilepsy, psychedelics, and the anesthetic ketamine. Dissociative agents have been used since antiquity in indigenous cultures for medical and religious practices and recently have been demonstrated to be efficacious following single dose in treating neuropsychiatric disorders. Several studies point to the importance of the actual dissociative state for the therapeutic effect of ketamine and other psychedelic drugs. The neuronal mechanisms that give rise to the dissociated state are not clear. In this project, we seek to study the neuronal basis and circuit properties of the dissociative state using ketamine in the living brain by two-photon microscopy at the level of single cells. Understanding the neuronal basis of the dissociative state will have a profound impact not only for the treatment of neuropsychiatric diseases but also for the deeper understanding of the relationship between sensory stimuli and their subjective perception.