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Brain circuitry and long-term effects of social trauma

Social trauma is one of the most common and intense stressors that humankind experiences across centuries. It has been often linked with anxiety- and stress-related psychiatric diseases, while the neurobiological mechanisms that lead from trauma to psychopathology remain elusive. Social trauma can take many forms such as war, bullying, social discrimination and intimate partner violence. In particular, the detrimental effects of social isolation were and still are becoming evident via the Sars-CoV-2 pandemic as the incidence for psychiatric disorders has significantly increased. Pharmacological treatments available to clinicians are multiple but they are not always efficient, with many secondary unwanted effects.

On the other hand, affiliative and prosocial interactions are critical for the well-being of most social species and they are processed in the brain in a unique way, integrating multiplexed information from all sensory modalities. The role of prosocial interactions as a buffer for the effects of stress has recently come to the spotlight.

Using a variety of approaches such as optogenetics, chemogenetics, fiber photometry and whole cell patch clamp recordings in mice, we aim to dissect the long-term consequences of social stress on behavioral outcomes and brain plasticity. We will mainly focus on the brain dopaminergic system and its connections to other regions, such as the lateral hypothalamus, in determining vulnerability to the lasting effects of social trauma. We also aim to address questions with impactful translational potential, and in particular, whether positive social interactions can alleviate the detrimental effects of social stress.