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Research summary

Individuals who suffer from post-traumatic stress disorder (PTSD) exhibit a persistent avoidance of places or situations associated with a traumatic event. Persistent avoidance can interfere with daily activities and prevents individuals from overcoming their fears through extinction. Active avoidance has sparked interest among researchers to better understand how to ameliorate excessive avoidance that is observed in patients with post-traumatic stress and other anxiety disorders. Active avoidance can be studied in rats using a platform-mediated avoidance task, in which rats learn to avoid a tone-signaled footshock by stepping onto a platform. Our recent study showed that pharmacological inactivation of the rostral prelimbic prefrontal cortex (rPL) delayed avoidance. Moreover, it was also found that inhibitory tone responses in rPL signal the option to avoid the tone-triggered footshock. However, it is unknown which rPL projections drive avoidance. We have been examining distinct projections of rPL to either the ventral striatum (VS) or basolateral amygdala (BLA) using an optogenetic approach. Our current aims are to characterize the different types of neurons involved in these circuits and determine what responses are necessary for avoidance. Our ultimate goal is to elucidate the neural mechanisms of avoidance expression and provide insight for developing novel treatments and therapies for individuals suffering from PTSD and other anxiety disorders.