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## **Neuropeptidergic regulation of Compulsive Seeking behavior in *C. elegans***

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An improved understanding of the molecular basis of substance seeking despite the catastrophic consequences of substance abuse is likely to enrich our treatments for Substance Use Disorders (SUD) and comorbidities. The compulsive seeking is characterized by an imbalance between the superior drive to substance and disruption in control of substance use. In order to model this highly complex neuromodulation, we addressed sophisticated behavioral paradigms in *C. elegans*, that have a simple nervous system but the most completely defined connectome, with the advantage of the straightforward genetic, behavioral, and neurophysiological investigation. To model the development of compulsive engagement of substance seeking, we exploit two distinct behavioral programs in conflict, substance preference and avoidance of aversive stimulus, simultaneously.

We demonstrated that *C. elegans* exhibited the recapitulation of the pivotal features of compulsive seeking of alcohol/nicotine in mammals, which are repeated attempts, endurance, and aversion-resistant substance seeking.

We demonstrated that the neuropeptide signaling CRF receptor-like GPCR facilitates the development of ethanol preference and compels animals to seek ethanol compulsively in a worm. Subsequently, our functional genomic approach identified the interaction between neuropeptidergic signaling, CRF receptor-like GPCR and Neurokinin receptor orthologue to progress compulsive ethanol seeking. Similarly, we pursue to assess the interplay between these two neuropeptides signaling associated with the development of compulsive nicotine seeking.