Coding of social signals by glutamatergic and GABAergic connections in the social neural network
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A conserved network of brain regions is responsible for mediating social behavior; however the chemical nature (GABAergic or glutamatergic) of the connectivity in this network is unknown. One node in this network is the medial amygdala (MA), and its major output region the bed nucleus of the stria terminalis (BNST). Another important area is the medial preoptic area (MPOA), which is imperative for full expression of sexual and parenting behaviors. These regions process social stimuli and facilitate appropriate behavioral responses. Identifying the characteristics of these connections is critical for understanding how these areas interact functionally. We aim to identify the phenotype (GABAergic or glutamatergic) of socially responsive projection neurons from in the MA, medial amygdala to the BNST and MPOA of male hamsters. Combining fluorescent immunohistochemical and in situ hybridization techniques, we will measure colocalization of the immediate-early gene product Fos (an indirect marker of cellular activation) with retrograde tracer cholera toxin beta (CTB) conjugated to Alexa Fluor 594 into the BNST of adult male Syrian hamsters. We then used fluorescent in situ hybridization to colocalize the CTB labeled cell bodies with GAD65 (a marker for GABAergic cells) or vGlut2 (a marker for glutamatergic cells) in response to male, female or neutral stimuli. We also aim to identify the phenotype of MPOA neurons. Exposure to social stimuli increases the expression of the immediate-early gene c-fos, which we used as a marker for neural activation. This tissue was processed using fluorescent in situ hybridization for vGlut2 and GAD65 as well as immunohistochemistry for c-fos positive cells.