The Influence of Chronic Stress on CRH Neuron Excitability in the BNST in Mice

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The bed nucleus of the stria terminalis (BNST) is an important limbic structure that is part of the extended amygdala complex. Within this pathway, it is involved in coordinating the responses to stress. A key mediator of the stress response is corticotropin-releasing hormone (CRH), a compound acting in a variety of brain regions. Chronic exposure to stress can result in the maladaptation of this system and the development of mood disorders in humans. The purpose of this study was to determine the effects of a chronic stress protocol on excitatory signaling occurring in the BNST when exposed to a CRH agonist. Male and female mice of approximately 8 weeks of age underwent a 6-week chronic variable mild stress (CVMS) paradigm consisting of 1-2 daily mild stressors. Slices of brain tissue containing the BNST were then collected from each mouse at the end of the 6 weeks and prepared for whole-cell patch clamp electrophysiology. Recordings of excitatory post-synaptic currents (EPSCs) in CRH-expressing neurons were collected in response to Stressin (CRH agonist) and the vehicle. Preliminary results suggest that there is a significantly greater area under the curve of EPSCs in non-stressed male mice compared to stressed male mice. Stressed male and female mice did not show a greater sensitivity to Stressin compared to non-stressed mice. Future directions involve continuing electrophysiological data collection of excitatory and inhibitory post-synaptic currents in CRH neurons to better understand the involvement of the BNST in the physiological response to chronic stress. Supported by R01MH123544.