

Department of Neuroscience and Behavior

Patina Lui

Mentor: Russell D. Romeo

## The Age- and Experience-Dependent Plasticity of the Stress Response

Adolescence is a time when the brain undergoes extensive structural and functional changes that affect an organism's physiology and behavior, including the stress response. Though there is an understanding of the profound differences between prepubertal and adult experience-related effects on the hormonal stress response, their relationship to the neurobiological stress response remains unclear. To study this association, pre-pubertal and adult male rats were exposed to acute, homotypic, or heterotypic stress experiences. The paraventricular nucleus of the hypothalamus (PVN) is implicated in the direct hormonal release of the stress hormones adrenocorticotropic hormone (ACTH) and corticotropin releasing hormone (CRH), while the pPVT is associated with the coding of stressful experiences. Both regions were examined for cellular activation using FOS immunohistochemistry. Within the PVN, prepubertal animals were consistently more activated than the adults. With experience, trends suggest a faster activation of cells in the PVN by juveniles. In the pPVT region of the brain, acute stress prompted a significant increase in activation immediately after stress events, while homotypically and heterotypically stressed animals both displayed a habituated response. Both PVN and pPVT regions showed differential responses to stress events suggesting these areas are implicated in the plasticity of the pubertal-related changes in stress reactivity. Finding the possible nuclei involved in the differential stress response patterns between prepubertal and adult organisms under various stress experiences will help to identify neural substrates involved in age- and experience-dependent changes in stress reactivity.