



Editorial: A brief overview of the 2018 Neurobiology of Stress Workshop



This Special Issue is dedicated to the 2018 Neurobiology of Stress Workshop, which was held in Banff, Canada in June 2018 and organized by Matthew Hill and Jaideep Bains from the University of Calgary. Previously this meeting has been organized by Robert Spencer from the University of Colorado (2010), Jim Herman from the University of Cincinnati (2012), Seema Bhatnagar and Teresa Reyes from the University of Pennsylvania (2014) and Tallie Baram from the University of California, Irvine (2016). The Neurobiology of Stress Workshop is an international, biennial meeting that attracts the leaders of stress biology to discuss the neurobiological processes impacted by stress exposure and the pathological consequences of stress. Although the focus is on the neurological consequences of stress, there is also an emphasis on brain-body interactions in stress reactivity. The goal of this Special Issue is to provide an overview of the meeting, with a particular emphasis on the contributions of our junior colleagues.

Goldfarb and coworkers presented their ongoing studies that are examining differences in the neural networks that are activated by emotional stressors. These studies have identified sex and region-specific differences in stress reactivity and thereby provide insight into how neural networks are perhaps differentially affected by emotional stressors in men and women. Rincon-Cortes and coworkers also focused on sex differences in their symposium entitled "Influence of sex, gender and reproductive status on stress". This session highlighted the sex differences in developmental, endocrine, neurochemical and behavioral differences in stress reactivity in rodents and humans. In their symposium, Balsevich and colleagues discussed the mechanistic relationships between stress and metabolism and the many nodes of endocrine, genetic and behavioral convergence between neuropsychiatric disorders and metabolic diseases. This session also highlighted the importance of sex and circadian rhythms at the intersection of stress reactivity and metabolism. Lapp and coworkers presented their ongoing studies that are examining the effects of stress on transposable elements. These elegant findings suggest that stress effects on transposable elements provide insight into differences in resilience and susceptibility, especially from a developmental perspective, and how stress effects on transposable elements may increase the risk of developing stress-related neuropsychiatric disorders. Anderson and colleagues presented their ongoing studies demonstrating that chronic unpredictable stress differentially impacts synaptic transmission in dopamine 1 receptor-expressing pyramidal neurons vis-à-vis dopamine 2 receptor-expressing pyramidal neurons in infralimbic and prelimbic cortex. Such observations suggest that D1 versus D2-mediated stress responses may differentially impact stress reactivity in the prefrontal cortex. Jiang and colleagues discussed their recent findings that have identified a novel

corticotropin-releasing factor (CRF)-expressing population in the paraventricular nucleus (PVN) that regulates HPA axis activity. Such observations suggest that synaptic signaling within the PVN mediated by CRF plays a critical role in stress responsive circuits. In their symposium, Daviu and colleagues discussed the neuronal circuits that mediate stress-induced behaviors, as well as the cellular and molecular mechanisms that contribute to the bi-directional relationship between stress and anxiety. This session nicely integrated our current understanding of how neurotransmitters like norepinephrine and neuropeptides like CRF activate shared neuronal networks to shape both stress and anxiety. Chakraborty and coworkers described their ongoing studies demonstrating that corticosterone prevents the delayed morphological alterations in the basolateral amygdala and anxiety-like behavioral changes elicited by acute immobilization stress. Such findings support clinical observations that glucocorticoid administration provides protections against the development of symptoms of post-traumatic stress disorder (PTSD). Mayo and coworkers discuss their recent studies that have focused on facial expressions as a measure of social and emotional processing of stress reactivity. Their studies suggest that the endocannabinoid system and gender are critical components of this potential diagnostic marker for stress-related neuropsychiatric disorders. Weiss and coworkers presented their ongoing studies that are examining the rapid effects of glucocorticoids (GCs) on the endocannabinoid system. Their results indicate that the non-genomic effects of GCs include activation of phospholipase C and increases in intracellular calcium levels, thereby providing insight into the signal transduction mechanisms through which GC-endocannabinoid interactions modulate excitatory neurotransmission.

We hope that the reviews collected here provide a survey of the depth and breadth of scientific findings presented and the discussions they occasioned in Banff and that their wider dissemination here will encourage others in the field to attend future meetings. The Banff meeting continued to build on the strength of previous meetings, particularly with regard to the focus on trainees and career development with trainee centered panels, networking opportunities and face to face interaction in a highly collegial environment. As stress researchers who have benefitted from this network, both in our own careers and in the careers of our trainees, this supportive environment represents a history we are proud of and a future we look forward to.

The next Neurobiology of Stress Workshop will be held in Columbia, SC and will be hosted by the University of South Carolina May 12 through May 15, 2020. We look forward to seeing everyone in Columbia!

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