TACKLING MENTAL HEALTH DISORDERS IN FEMALES

PRINCIPAL INVESTIGATORS

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ABOUT THE PROJECT

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The medial hypothalamus, amygdala and dorsal periaqueductal gray (dPAG) and the inferior colliculus (I C) have been grouped together as an "encephalic aversion system" (EAS). The neural substrates responsible for fear and anxiety of these structures translate information of aversive nature in behavioral and emotional adaptive output reactions. Nowadays, it is believed that the EAS possess a sensorimotor filter that functions as a gating for the threatening stimuli. Malfunctioning of this filter results in maladaptive processing that may lead to anxiety. The understanding of the neurochemical, anatomical and genetic substrates of fear and anxiety must take into account the chemistry of the "defense-system" in a broader approach and prospect. It has been proposed that GABAergic mechanisms are involved in the gating of distinct sensory information of aversive nature depending on the midbrain structure which is activated. The prefrontal cortex and the core and shell subregions of the nucleus accumbens (NAC) may also contribute to the organization of defensive reactions to threatening and dangerous situations. Besides GABA, 5-HT, opioids, dopamine, neurokinins and excitatory amino acids have ali been implicated in the regulation of anxiety-related behaviors induced by stimulation of the EAS. However, little is known on how they regulate the processing of aversive information. This project will tackle on how these neurochemical mechanisms modulate the sensory information input and the behavioral output underlying the defensive responses associated with fear and anxiety.
It is also our purpose to determine the extent to which the combined activity of the hypothalamic-pituitary-adrenal (HPA) axis and the neurochemical systems involved in the expression of conditioned and unconditioned fear responseswork together in the modulation of the defense reaction. The challenge will be to establish an integrative approach (behavioral, pharmacological, electrophysiological, neurochemical and imunohistochemical) that enable us to characterize the whole stimulus-defensive behavior process instead of treating the defense reaction in relative isolation, and secondly, the neurochemical and anatomical systems that subserve the consequences of aversive information to the organism so as to produce knowledge that might lead to therapeutic change using novel behavioral and drug therapy. This project also dedicate part of its financial resources for diffusing the acquired knowledge in the neurobiology of anxiety and depression to the general public. In this respect we act in partnership with the Institute of Neurosciences and Behavior (INeC), which is a non-profit private organization of public interest, with infrastructure set up for the organization of courses and scientific meetings, as well as for the elaboration of educational material that is available at its homepage (www.inec-usp.org).