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Stress, fight or flight? Towards a new understanding of mental illness, PVNC rh mechanism in stress regulation

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Stress is anything in the external world that knocks you out of homeostatic balance. Chronic is the key word and stress hormones secreted into the brain can actually make you think more clearly over the short term. The student cramming for a final exam initially benefits from increasing oxygen delivery and nutrients to the brain. But by the six hours mark that student would be thinking less clearly, the neurons not working as well and the capacity for memory retrieval fading. Modern-day humans undergo chronic stress, for instance when they are stuck in traffic, when they are worried about paying the mortgage. These chronic stressors lead to illnesses such as anxiety, depression, ulcers, and heart disease. Fight or Flight, will be the choices that our bodies react to stressful events. The hypothalamo-pituitary-adrenal (HPA) system is the major pathway in the mediation of the stress response. The hypothalamus releases corticotropin-releasing hormone (Crh) in response to stress, Crh acts on the pituitary gland, triggering the release of adrenocorticotropin (ACTH) into the bloodstream, which subsequently causes the hormonal end-product of the HPA-axis, corticosteroid release from the adrenal cortex. Crh-expressing neurons are mainly located in the paraventricular nucleus of hypothalamus (PVN) and amygdala. The role of PVNCrh in HPA axis regulation is indisputable, however, due to the lack of proper animal model, the role of PVNCrh in anxiety behavior regulation remains largely unknown. Our lab has successfully generated the Crhflox mice in which Crh exon 2 was chosen as the targeted exon because its removal would lead to excision of the entire coding region. Crhfl/fl mice were crossed with Sim1-Cre mice to delete the Crh mainly in PVN (PVNCrhKO). Mice with specific deletion of Crh from PVN have normal growth in terms of bodyweight, food intake and behaviors that were screened by Shirpa test.

Biography

Rong Zhang has completed her PhD at Kyushu University in Japan and postdoctoral studies from University of Cincinnati in USA. She was an Associate Professor at Fudan University in China and she is a Faculty at Harvard Medical School and Children's Hospital Boston. She has published more than 20 original research articles in peer-reviewed journals including Science, PNAS and Journal of Neuroscience. She regularly provides her professional opinions and reviews for some scientific journals. She has won several awards for her academic achievement from China, Japan and USA.

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