

CRF1 stress receptor is regulator of mast cell activity during stress

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A new study published online in the *Journal of Leukocyte Biology* provides new insight into how stress, through signaling of corticotropin-releasing factor (CRF), interacts with cells in the immune system to cause disease. Specifically, the study identified a new role for the stress receptor CRF1, which is expressed on mast cells (critical immune cells implicated in many stress-related gastrointestinal and immune disorders such as allergy). The results showed that mast cell CRF1 is a master regulator of mast cell activity during different types of stressful challenges, including psychological stress and anaphylaxis, or severe allergic reaction. The study could have direct implications for treatment of common and debilitating disorders including allergy, asthma, and gastrointestinal diseases.

"We all know that [stress](#) affects the mind-body connection and can cause disease. The question is, how?" said Adam Moeser, DVM PhD, associate professor and Matilda R. Wilson Endowed Chair within Michigan State University's College of Veterinary Medicine, Department of Large Animal Clinical Sciences, in East Lansing, Michigan. "This work is a critical step toward unlocking the complex mind-body connection by providing a new understanding of how stress influences the activity of the mast cell, which could lead to the discovery of new, more effective therapeutics.—hopefully, ones that will improve quality of life for people suffering from stress-related diseases."

Moeser and colleagues compared the physiologic responses of normal mice and mice that lacked CRF1 expression only on their [mast cells](#) to two types of [stress conditions](#): 1) [psychological stress](#), or 2) immunological stress caused by anaphylaxis induction. While the [normal mice](#) exposed to stress exhibited disease, the mast cell CRF1-deficient mice exhibited less disease and were protected against psychological and immunological stress. Another experiment in the study showed that treating mice with a selective inhibitor of the CRF1

receptor protected them from developing severe anaphylactic response.

"There is increasing awareness of the connection between neurological signals and the immune system, but relatively little is known about the specific details of how psychological events such as stress connect to immune function," said John Wherry, Ph.D., Deputy Editor of the *Journal of Leukocyte Biology*. "By identifying a key signaling pathway that is used by immune cells in both immune and psychological stress response, the authors may have uncovered a new target for therapeutics to treat physiological immune-related effects of various kinds of environmental stresses."

More information: Saravanan Ayyadurai et al, Frontline Science: Corticotropin-releasing factor receptor subtype 1 is a critical modulator of mast cell degranulation and stress-induced pathophysiology, *Journal of Leukocyte Biology* (2017). [DOI: 10.1189/jlb.2HI0317-088RR](https://doi.org/10.1189/jlb.2HI0317-088RR)

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