

New study examines what human physiology can tell us about how animals cope with stress

October 14 2020



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How we respond to stress has been a source of scientific research since the term was introduced more than 70 years ago. While the analysis of human stress response has provided valuable insight, new work from

University of South Florida researchers is offering a novel perspective on how other vertebrates may regulate flexibility in coping with stress.

When a person experiences stress, a variety of physiological responses kick in through a combination of molecular regulation, hormone secretion and the activation of the hypothalamic pituitary adrenal axis. These responses lead to changes in certain [physical characteristics](#), such as increased [blood pressure](#) and heart rate, as well as thought responses that affect how a person perceives and reacts to a stressful situation.

These physiological patterns are well-studied in human beings and have provided tremendous advancements in our understanding of the human body, as well as the long-term impact stress can have on mental health. It's insight that USF postdoctoral researcher Cedric Zimmer hopes to advance in other vertebrates dealing with a variety of environmental stressors in nature.

Zimmer is the lead author of a new paper published this week in the prestigious journal, *BioScience*. It examines the role a specific molecule, FKBP5, plays in the flexible regulation of stress response.

That focus on flexibility, as it pertains to stress, is a key component in this latest USF project and represents a still-emerging area of stress research. Flexibility refers to an organism's ability to produce and implement best coping strategies based on the current situation and past experiences. Researchers believe the molecule, FKBP5, has a fundamental role in this process.

"This molecule plays a critical function in a person's ability to cope with stress and the flexibility of this response in order to appropriately respond to a current stressful situation," Zimmer said. "So, what we've done is really bring together a tremendous amount of that academic research to develop a new framework for how any vertebrate deals with

stress and their propensity to flexibly cope with these stressors."

This work was published through a collaboration between several USF College of Public Health research groups led by Lynn "Marty" Martin, Monica Uddin and Derek Wildman.

While this publication provides an early framework for continued research, Martin believes it could be crucial in understanding the broader impacts of human influence on the environment. When humans and animals interact in ways they haven't before, that can have obvious effects on nature, but also unintended consequences to us.

"Stress influences the immune systems of animals, which then changes the way they pump out pathogens into the environment," Martin said. "And when those pathogens can also infect humans, as is the case for West Nile virus, Salmonella and many others, the importance of understanding stress in animals is not only critical for their wellbeing, but for ours as well."

Researchers hope this work can help further the understanding of the role FKBP5 molecules play in regulating stress response flexibility and long-term impacts that has on a vertebrate's ability to cope with [stress](#).

Provided by University of South Florida

Citation: New study examines what human physiology can tell us about how animals cope with stress (2020, October 14) retrieved 24 April 2024 from <https://medicalxpress.com/news/2020-10-human-physiology-animals-cope-stress.html>

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