On the Intergenerational Effects of Stress

Intergenerational effects of paternal predator cue exposure on behavior, stress reactivity, and neural gene expression by Professor Jen Grindstaff

Anyone who has watched an episode of National Geographic or even five minutes of the Discovery channel have observed the interactions between a predator and its prey. In the classic depiction of the lion stalking an antelope, we notice the intricacies of eye contact, slight movements, camouflage, ect - these are the observable effects of fight or flight. However, what we may not be able to observe is the intergenerational effects of the predator/prey relationship. Predatory interactions affect both individual growth rates of surviving prey but also the rates and success of offspring. In this article, the scientific publication by OSU faculty member Jennifer Grindstaff will be reviewed to help us further understand the "intergenerational effects of paternal predator cue exposure" on offspring.

Jennifer Grindstaff is currently an associate professor at Oklahoma State University in the Integrative Biology department teaching in the fields of endocrinology, immunology, behavior, biology and ecology. Jennifer recalled her first encounter with research during a seventh grade summer research program funded by the National Science Foundation; it was then that she worked with faculty in geology research and became interested in biological research. She continued this passion into highschool through science clubs and science fair competitions, and eventually into college, graduating Indiana University with her ph.D. in 2004.

During my interview with Professor Grindstaff, she explained what interested her in the study of behavior, stress, and gene expression. This research topic was chosen by a former undergraduate student, Kelsey Brass, who was enrolled in Professor Grindstaff's lab course on Mammalian Physiology. "She learned about stress and behavior research in the course and developed the specific idea for this research involving epigenetic effects through her readings in BNE" says Professor Grindstaff. The basis for this study had evolved from other similar studies, however this specific topic on paternal predator exposure and its effects on offspring phenotypes has not been previously studied. In the published paper, it is explained that male mice were exposed to a predator odor (experimental) or a neutral odor (control) before mating. Then offspring "behavioral phenotypes" were studied throughout growth and development. The response to stressors is very complex and it is important to note that the response is highly contingent upon the severity of the stressor. In this way, the results to this study were unexpected - finding that offspring of the TMT-exposed males were more active and less anxious than the controls. Professor Grindstaff notes that the mice may have perceived the TMT as a less severe stressor than what was originally predicted. Looking back on this study, Professor Grindstaff is very proud of all those involved and the time and efforts it took to conduct this successful study.