

Two brain structures key to emotional balance especially in threatening situations

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Researchers have discovered that a primitive region of the brain responsible for sensorimotor control also has an important role in regulating emotional responses to threatening situations. This region appears to work in concert with another structure called the amygdala to regulate social and emotional behavior.

Georgetown University Medical Center researchers have recently discovered that activation of a primitive brain region, the deep layers of superior colliculus (DLSC), elicits defensive behaviors such as an exaggerated startle, hypervigilance, cowering, and escape. Researchers say it is possible that a prolonged activation of this defense system may lead to emotional disorders.

In a study presented at the 39th annual meeting of the Society for Neuroscience, the GUMC scientists say, in addition to triggering defensive behaviors, the activation of DLSC leads to a decrease in affiliative social interactions. Typically, social interactions are thought to be domain of the amygdala, a region known to work closely with high-level executive structures to regulate emotional processes. The researchers say there is no information about possible interactions between the amygdala and DLSC for regulating social and emotional responses. They decided to try simultaneously activating DLSC while inhibiting the amygdala. In doing so, they discovered that the manipulations cancelled each other out.

"These results suggest that the amygdala and DLSC interact to modulate

emotional and social behaviors, either directly, or indirectly by converging on a common target in the brain," says Ashley Decker, a research assistant in the pharmacology department at GUMC, and now a student at the Georgetown University School of Medicine. "The understanding of the functional interaction between these two [brain](#) structures is expected to reveal novel targets for therapeutic intervention for [post traumatic stress disorder](#) and other [anxiety disorders](#)."

Source: Georgetown University

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