## research highlights

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## NEUROSCIENCE

## Serotonin and the heart of fear

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The presence of a nearby but not immediate threat often produces a freezing response, both in animals and in humans. Freezing is associated with bradycardia (slowed heart rate) via the parasympathetic nervous system. However, the role of genetics in individual differences in fear-induced freezing and bradycardia has remained unclear.

In a new study by Pieter Schipper and colleagues of the Donders Institute, the authors found that human carriers of the less-expressed S allele of the *5HTTLPR* gene showed higher fear-induced bradycardia. Functional MRI revealed stronger functional connectivity between the periaqueductal grey and amygdala in S carriers.

Then, Schipper et al. found enhanced and prolonged fear-induced bradycardia in 5-HTT knockout rats. 5-HTT knockout rats showed increased activity in the somatostatin neurons of the central amygdala, which are known to project to the periaqueductal grey.

The study points to 5-HTT as a neurogenetic contributor to individual differences in anticipatory threat responses, including fear-induced bradycardia. More work will be required to determine the mechanism by which 5-HTT expression has these effects.

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