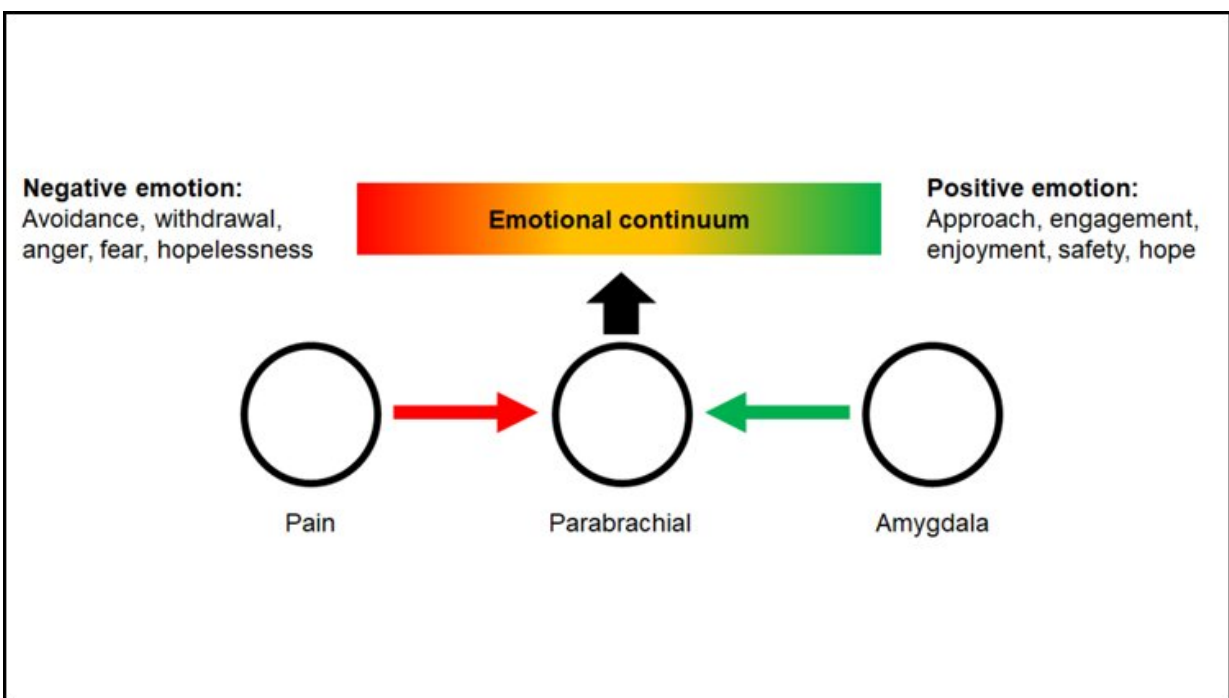


Activating an amygdala-brainstem pathway relieves pain and improves emotional state in rats

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Selective activation of amygdala neurons projecting to the brainstem parabrachial nucleus alleviated pain and fear, and promoted positive affect in rats. The schematic diagram shows a working model in which pain drives negative emotion by affecting parabrachial neurons, while amygdala input to the parabrachial drives positive emotion. Activation of these amygdala neurons would be expected to relieve the emotional burden experienced by chronic pain patients, thus supporting their recovery and mental well-being. Credit: Roni Hogri, 2022.

Activating a circuit between the amygdala and brainstem relieves pain and reduces defensive behaviors in rats, according to research recently published in *JNeurosci*.

People with pain often experience psychological comorbidities like anxiety and depression, which can end up making their prognosis worse. A pathway from the amygdala to a nucleus in the brainstem may offer a way to treat pain's toll on both the body and the mind. Hogri et al. activated the circuit in [rats](#) and measured their response to chemical, mechanical, and thermal pain stimuli. Stimulating the circuit decreased the brainstem's response to all three stimuli, indicating [pain relief](#). In a separate situation, stimulating the circuit decreased the rats' defensive behaviors in response to a threat. It also increased reward and feeding behavior, a sign the rats felt safe. The combination of these behavior changes indicates the circuit steers rats out of a negative emotional state and into a positive one.

In humans, there is not yet a way to stimulate a specific brain circuit. Existing brain stimulation technologies are not precise enough and could activate neighboring circuits that could increase pain and [negative emotions](#). But addressing these technical roadblocks could lead to a treatment that addresses both the pain itself and the [negative feelings](#) it generates.

More information: GABAergic CaMKII α + amygdala output attenuates pain and modulates emotional-motivational behaviour via parabrachial inhibition, *JNeurosci* (2022). [DOI: 10.1523/JNEUROSCI.2067-21.2022](https://doi.org/10.1523/JNEUROSCI.2067-21.2022)

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