

Researchers find basal forebrain controls decision-making speed in rodents

March 19 2014

Neural activity in the basal forebrain (BF) leads to a faster and more precise response to reward-based stimuli in rats, report Irene Avila and Shih-Chieh Lin of the National Institute on Aging at NIH, in the March 18, 2014 issue of *PLOS Biology*.

Stimuli that predict important behavioral outcomes such as a reward or punishment are known as motivationally salient. Quick decision speed, especially in response to such motivational salient stimuli, is important for survival in animals. In humans, slowed decision speed is a key feature in depression, schizophrenia, and cognitive aging.

Rats were trained to respond to two sound [stimuli](#) associated with either large or small rewards. Researchers found that BF [neurons](#), located in the bottom front part of the brain at the base of the cerebral cortex, responded more strongly to the sound associated with the larger reward. Artificially stimulating the BF neurons shortly after this motivationally salient signal led to faster and more precise reaction times.

This study helps describe an important function of an otherwise poorly understood group of neurons. While more research is needed, these findings could have clinical implications for treating human conditions related to slow decision-making speeds.

More information: "Motivational Salience Signal in the Basal Forebrain Is Coupled with Faster and More Precise Decision Speed" by Avila, I and Lin, S-C. *PLOS Biology*. 12(3):e1001811. [DOI](#):

[10.1371/journal.pbio.1001811](https://doi.org/10.1371/journal.pbio.1001811). March 2014.

Provided by National Institutes of Health

Citation: Researchers find basal forebrain controls decision-making speed in rodents (2014, March 19) retrieved 19 April 2024 from <https://medicalxpress.com/news/2014-03-basal-forebrain-decision-making-rodents.html>

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