



NEUROSCIENCE

Economic decision-making needs communication between brain regionsGore, F. et al. *Nat. Neurosci.* **26**, 1566–1574 (2023).

Life is a constant evaluation of the outcome of our decisions and which one is more beneficial to ourselves. Therefore, economic decision-making—the process behind such choices—is critical for survival and well-being. Before any decision is taken, the individual must process the information about each option and outcome while predicting the value of each alternative. These subjective value representations have been found to be encoded primarily in the orbitofrontal cortex (OFC), and stimulating the area can affect this choice. Although other brain areas have been found to be involved in the process of decision-making behavior in rodents, little is known about how these areas interact with others. A new study in *Nature Neuroscience* looks at these interactions in an economic decision-making task that was adapted for rats.

After validation of the test and with rats being able to understand the two types

of visual cues presented and the associated reward amount, it was possible to see that rats consistently chose larger rewards of their preferred flavor. With that knowledge and using an optogenetic inhibition approach aided by injected adeno-associated virus (AAV) in the expected areas to intervene in the process, the researchers showed that optical inhibition of the OFC and the dorsomedial striatum (DMS) impaired decision-making in the animals. When taking electrophysiological recordings of the OFC and DMS of rats making decisions, they found very similar neural encoding in both areas. Similar to what happened when inhibited, only OFC neurons seemed to strongly respond to the subjective value of the event while responding first when compared to DMS. Additionally, inhibition of OFC communication with DMS impairs decision-making when related to the volume of

reward while retaining a preference for the type of reward.

Previous work suggests that activation, inactivation and injuries to brain areas such as the OFC have an effect on economic decision-making, although with contradictory results. In this new study, the researchers, by leveraging optogenetics capabilities with a new training paradigm, showed the strong role of the OFC and DMS areas and their communication for economic decision-making. These results show that economic decision-making requires weighing the subjective value of a stimulus to choose the appropriate response, which is guided by critical anatomical areas of the brain.

Jorge Ferreira

Published online: 27 September 2023
<https://doi.org/10.1038/s41684-023-01267-1>

*NEW – Isolation Building/Study Facility
 Book your studies!*

Ridglan Farms

Bred to be Better...Raised to be Best

For 50 years Ridglan Farms, Inc. has provided the highest quality beagles for biomedical research. The Ridglan colony has adhered to the strictest standards of quality in breeding, socialization, health care and colony management.

In toxicology, pharmacology and other fields of science, the *RIDGLAN BEAGLE* has earned its reputation of superiority.



- Superior Health
- Intense Socialization
- Outstanding Customer Service
- Housing
- Field Safety Studies

- Licensed Research Facility
- DOI Studies
- Beagle Serum, Plasma, Whole Blood
- Neuter/Spay upon request
- Littermate Selection

