

Researchers find monkey brain structure that decides if viewed objects are new or unidentified

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A team of researchers working at the University of Tokyo School of Medicine has found what they believe is the part of the monkey brain

that decides if something that is being viewed is recognizable. In their paper published in the journal *Science*, the team describes a series of brain experiments they conducted with macaques that shed light on how the animals decide whether they have seen something before or not.

To learn more about how the monkey brain decides if it has already seen something it is viewing, the team trained several Japanese macaques to give certain signals when presented with an object to report if they believed they had seen the object before. After training the [monkeys](#) on 20 to 30 objects, the researchers moved on to the next stage of the study—using optogenetic switches they created in different brain parts. Such switches allow for activating selected neurons by pointing a light at them.

In their study, the researchers focused on the [perirhinal cortex](#), which is part of the temporal lobes. Prior research had suggested that the perirhinal cortex is the last stop on a sequence of events that occurs in the brain when a monkey looks at something, suggesting that it might be the part of the [brain](#) that determines if it has seen something before.

In the first tests, the researchers lit up the whole perirhinal cortex, triggering all of its neurons. Doing so, they discovered, caused the monkey to signal that every object shown to it was familiar. Next, they were more selective, shining the light on different parts of the perirhinal [cortex](#)—doing so produced different results. If they activated neurons in just the front, the monkey reported everything as familiar, whereas activating neurons in back caused the monkey to offer mixed results, sometimes signaling they'd seen something new when actually looking at something that was quite familiar. The team ran the same experiments again, but the second time, they used electricity to stimulate the [neurons](#) instead of light, reporting nearly identical results. The researchers suggest their findings indicate that recognition of viewed objects is a learned trait rather than a signal that is generated due to imprinted

physical characteristics of the object.

More information: Keita Tamura et al. Conversion of object identity to object-general semantic value in the primate temporal cortex, *Science* (2017). [DOI: 10.1126/science.aan4800](https://doi.org/10.1126/science.aan4800)

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