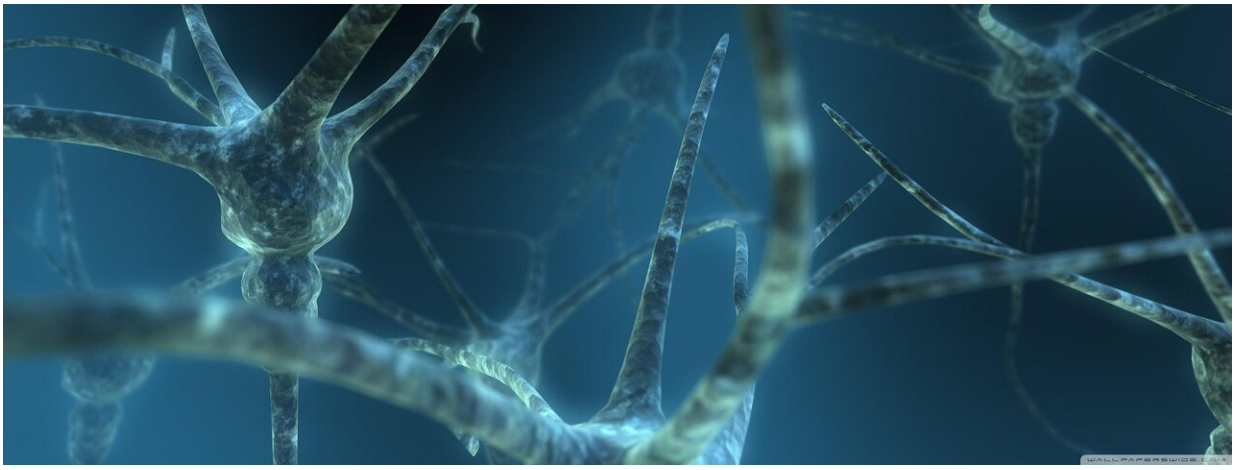
Shedding light on the robustness of short-term memory during distractions

April 21 2021, by Bob Yirka



Credit: Pixabay/CC0 Public Domain

A team of researchers at Howard Hughes Medical Institute has learned more about the brain processes involved in short-term memory retention when distractions occur. In their paper published in the journal *Nature Neuroscience*, the group describes memory experiments they conducted with lab mice and what they learned from them.

Over the past several decades, scientists have learned more about the parts of the brain that are involved in locomotor activities. As one example, they have found that the anterior lateral motor cortex (ALM) plays a major role when the brain is engaged in planning an activity. In

this new effort, the researchers wondered what sorts of things go on in the brain when it is engaged in planning a short-term assignment, for instance, the order of tasks at work, but is interrupted by some other event. How would an event like an interrupting phone call impact their ability to remember the plan for doing their tasks?

To find out, the researchers applied optogenetic activation of vibrissal of the somatosensory cortex in test mice—they shone a light on the part of the mouse brain responsible for processing information from their whiskers. But first, the mice were trained to lick on the right side of an object if they felt the stimulus and on the left side of the object if they did not. They then had the mice engage in a planning type of activity that involved reacting to what they sensed with their whiskers.

After running the experiment, the researchers found that if a distraction occurred early in the process of conducting a planning event, it tended to have a much bigger impact on the ability of the mouse to remember the way it had planned to carry out an activity. They suggest this finding indicates that the ALM may have a suppression ability. As a distraction occurs, the mouse may have the option of suppressing incoming information, allowing for retention of the original planning information—the finding may be applicable to people. They note that it is also possible that during their experiments, the mice found the distraction more interesting than the activities they had been planning, which could alter the degree to which they allowed the distracting information to take precedence over the original planning information.

More information: Arseny Finkelstein et al. Attractor dynamics gate cortical information flow during decision-making, *Nature Neuroscience* (2021). DOI: 10.1038/s41593-021-00840-6