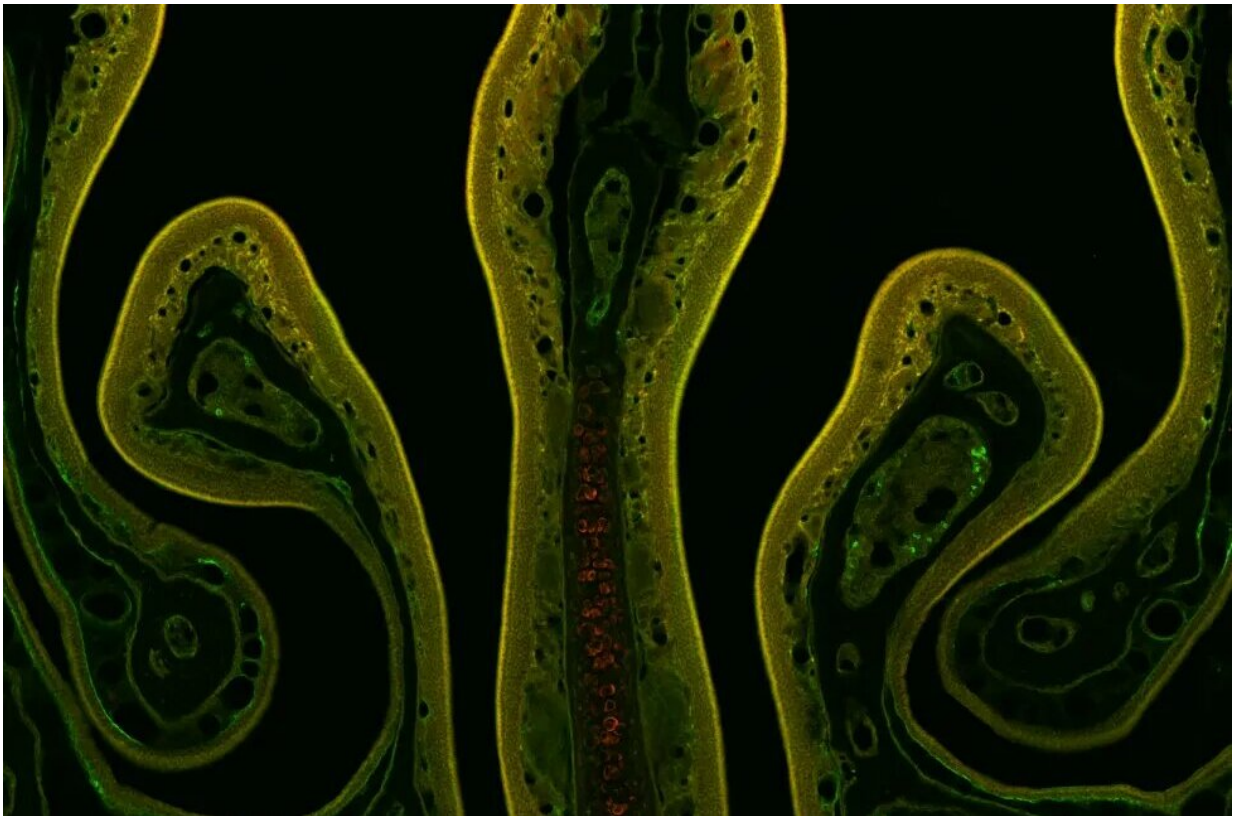


Study uncovers mechanism behind loss of smell in Parkinson's patients

April 21 2023, by Jennifer Chen



Credit: Society for Neuroscience

Parkinson's disease is an illness well known for its motor symptoms—tremor, stiffness, and slowness of movement. In a new paper published in *The Journal of Neuroscience* and featured on its

cover, researchers at Yale School of Medicine have uncovered the biological mechanism behind another common, but less studied symptom—the loss of smell.

About 75%–90% of Parkinson's patients report diminishing [sense of smell](#), even prior to the onset of [motor symptoms](#), and is now recognized a non-motor symptom of Parkinson's disease.

Researchers at the Greer Lab and Chandra Lab at Yale School of Medicine determined the biological mechanisms behind this olfactory impairment by using an alpha-synuclein A30P mouse model used to mimic symptoms of Parkinson's in mice.

Using buried food tests, the researchers found that the mice with later stage symptoms of Parkinson's disease exhibited olfactory impairment. They found that those mice with olfactory deficits exhibited severe pathology in projection neurons of the olfactory pathway. They also found these mice showed reduced neurogenesis in the [olfactory bulb](#). In contrast, studies have shown that healthy aging brains continue to form new neurons in the olfactory bulb throughout life.

Parkinson's patients had been reporting diminishing sense of smell for years, says corresponding author, Charles Greer, Ph.D., vice chair of research at the department of neurosurgery and professor of neuroscience at the Yale School of Medicine. However, since the motor symptoms of the disease were more debilitating, very little research had been done to understand the underlying [biological mechanism](#) of the olfactory dimension.

"We are excited to begin to understand the basis of anosmia in Parkinson's disease patients," says Sreeganga Chandra, Ph.D., associate professor of neurology and neuroscience.

"We set out to understand the nature of a symptom that's associated with Parkinson's disease that's been largely anecdotal. People that are diagnosed with Parkinson's disease would report [loss of smell](#) up to 10 years before their diagnosis. These findings could help in developing a very early diagnostic tool for the disease," says Dr. Greer.

More information: Eduardo Martin-Lopez et al, α -Synuclein Pathology and Reduced Neurogenesis in the Olfactory System Affect Olfaction in a Mouse Model of Parkinson's Disease, *The Journal of Neuroscience* (2023). [DOI: 10.1523/JNEUROSCI.1526-22.2022](https://doi.org/10.1523/JNEUROSCI.1526-22.2022)

Provided by Yale University

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