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New Partnership to Study Link between Olfaction and Neurodegenerative Disease

Collaboration between Monell Center and Brain Health Registry will increase understanding of the relationship between olfactory decline and brain-related diseases

PHILADELPHIA (May 17, 2016) – Deterioration in a person’s ability to smell can sometimes be an early sign of neurodegenerative diseases such as Parkinson’s or Alzheimer’s. Now, researchers at the Monell Center have established a collaboration with the [Brain Health Registry](#) (BHR) to gain better insight into how changes in a person’s sense of smell may relate to their health status and cognitive function. The partnership will lead to greater understanding of the relationship between olfactory decline and brain-related diseases.

“Declines in olfactory function have been shown to be among the earliest signs of brain-related neurodegenerative diseases, but we need more data to better understand this connection,” said Monell olfactory scientist Pamela Dalton, PhD, MPH. “Adding an olfactory assessment to the BHR’s large existing database may yield the best information yet on the predictive relationship of olfactory function to neurodegenerative disease.”

The Brain Health Registry (BHR) is an online repository of information provided by adult volunteers age 18 and older about their health, medical history, and lifestyle. Participants also complete online neuropsychological tests to measure their current cognitive function. Volunteers are encouraged to return to the site for additional assessments every 3-6 months over their lifetime, which will provide researchers with information about how the human brain and cognitive abilities change over time. At present, the BHR has over 40,000 registrants.

The nature of the olfactory system makes it a valuable tool to help identify the onset and early stages of neurodegenerative disorders, which are difficult to diagnose before symptoms appear. This is because the cells that detect odors, called olfactory receptor neurons (ORNs) have two remarkable properties: 1) they are nerve cells closely related to nerve cells in the brain, and 2) unlike brain nerve cells, ORNs continually regenerate throughout a person’s life.

Declines in olfactory performance can signal a change in the functional or regenerative capabilities of ORNs, and may also indicate neuronal deterioration in less accessible places, such as the brain. However, it is important to note that changes in a person’s sense of smell can occur for numerous reasons and that not all individuals with smell loss will develop a brain-related disorder. Findings from the collaboration may help to identify the specific parameters of smell loss most likely to signal neurodegenerative disease.

“Our collaboration with Monell will expand the Brain Health Registry to provide information concerning the association of a number of brain diseases, especially Parkinson’s disease and

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Alzheimer's disease, with a reduced ability to detect odors," said Michael W. Weiner, MD, founder and Principal Investigator of the Brain Health Registry, and Professor of Radiology and Biomedical Engineering, Medicine, Psychiatry and Neurology at the University of California, San Francisco.

Because the BHR also includes longitudinal data from many healthy adults, the collaboration may also increase knowledge about the basic functioning of the olfactory system beyond its role in brain disorders.

"Not many studies have followed olfactory function over a period of years, so we expect that the data we collect will help us understand how our sense of smell changes naturally over time," said Monell physiologist Cristina Jaén, PhD, an investigator on the project.

Monell researchers will begin the collaboration by conducting a pilot study with 1000 BHR participants to confirm their ability to self-administer olfactory tests using a mailed scratch and sniff test card with an online response format.

Over five million Americans over the age of 65 have Alzheimer's disease, and as many as one million live with Parkinson's disease. As the American population ages, the number of people suffering from these neurodegenerative diseases is expected to grow. There are no cures for either disease, but early diagnosis may help optimize treatment regimens to alleviate symptoms, and give patients and families time to seek additional support.

"In time, we hope to understand the most optimal timing for treatment regimens for these debilitating neurodegenerative diseases," said Dalton.

Brain Health Registry is a groundbreaking free, online platform designed to speed the path to cures for Alzheimer's disease, Parkinson's disease, depression, PTSD, mild cognitive impairment and other brain disorders. Brain Health Registry gathers data from volunteers who have registered and completed questionnaires and cognitive tests on the Brain Health Registry website. Brain Health Registry aims to reduce the cost of patient recruitment for clinical trials by building a large online pool of potential candidates. Led by Weiner along with other University of California, San Francisco researchers, the BHR collaborates with several top scientific institutions. For more information, or to sign up to participate, visit www.brainhealthregistry.org.

The Monell Chemical Senses Center is an independent nonprofit basic research institute based in Philadelphia, Pennsylvania. For over 48 years, Monell has advanced scientific understanding of the mechanisms and functions of taste and smell to benefit human health and well-being. Using an interdisciplinary approach, scientists collaborate in the programmatic areas of sensation and perception; neuroscience and molecular biology; environmental and occupational health; nutrition and appetite; health and well-being; development, aging and regeneration; and chemical ecology and communication. For more information about Monell, visit www.monell.org.