AMERICAN COMMITTEE FOR THE WEIZMANN INSTITUTE OF SCIENCE

SCIENCE FOR THE BENEFIT OF HUMANITY

CONTACT: Jeffrey J. Sussman
212.895.7951
jeffrey@acwis.org

THE SMELL OF WHITE

REHOVOT, ISRAEL—November 22, 2012—You can see the color white; you can hear white noise. Now, Weizmann Institute of Science researchers show that you can also smell a white odor. Their research findings appeared November 19 in the *Proceedings of the National Academy of Sciences (PNAS).*

The white we see is actually a mixture of light waves of different wavelengths. In a similar manner, the hum we call white noise is made of a combination of assorted sound frequencies. In either case, to be perceived as white, a stimulus must meet two conditions: The mix that produces them must span the range of our perception; and each component must be present at the exact same intensity. Could both of these conditions be met with odors, so as to produce a white smell? That question has remained unanswered, until now, in part due to such technical difficulties as getting the intensities of all the scents to be identical.

A research team in the Department of Neurobiology, led by research student Tali Weiss and Dr. Kobi Snitz, both in the group of Prof. Noam Sobel, decided to take up the challenge. They began with 86 different pure scents (each made of a single type of odor molecule) spanning the entire "smell map," diluted them to obtain similar intensities, and then created blends. Each blend contained a different mixture of odors from various parts of the smell map. These blends were then presented in pairs to volunteers, who were asked to compare the two scent-blends.

The team discovered that the more odors that were blended together in the paired mixtures, the more the subjects tended to rate them as similar – even though the two shared no common components. Blends that each contained 30 different odors or more were thought to be almost identical.

The researchers then created a number of such odor blends, giving them a nonsense name: Laurax. Once the subjects were exposed to one of the Laurax mixes and

became accustomed to the smell, they were exposed to new blends – mixtures they had not previously smelled. They also called some of these new blends "Laurax," but only if those contained 30 or more odors and these encompassed the range of possible smells. In contrast, mixtures made of 20 scents or fewer were not referred to as Laurax. In other words, Laurax was a white smell. In a follow-up experiment, volunteers described it as being neutral – not pleasant, but not unpleasant.

"On the one hand," says Prof. Sobel, "The findings expand the concept of 'white' beyond the familiar sight and sound. On the other, they touch on the most basic principles underlying our sense of smell, and these raise some issues with the conventional wisdom on the subject." The most widely accepted view, for instance, describes the sense of smell as a sort of machine that detects odor molecules. But the Weizmann study implies that our smell systems perceive whole scents, rather than the individual odors they comprise.

Also participating in the research were Adi Yablonka in the group of Prof. Noam Sobel and Dr. Elad Schneidman, also of the Department of Neurobiology.

Link: http://www.pnas.org/content/early/2012/11/15/1208110109.full.pdf+html

Prof. Noam Sobel's research is supported by the estate of Lore Lennon; the Adelis Foundation; the Nadia Jaglom Laboratory for Research in the Neurobiology of Olfaction; the James S. McDonnell Foundation 21st Century Science Scholar in Understanding Human Cognition Program; the Minerva Foundation; and the European Research Council.

# # #