# Odor ID not disguised by diet

October 31 2008

Reporting in the October 31 issue of the online journal *PLoS ONE*, scientists from the Monell Center present behavioral and chemical findings to reveal that an individual's underlying odor signature remains detectable even in the face of major dietary changes.

"The findings using this animal model support the proposition that body odors provide a consistent 'odorprint' analogous to a fingerprint or DNA sample," said Gary Beauchamp, PhD, a behavioral biologist at Monell and one of the paper's senior authors. "This distinctive odor can be detected using either an animal's nose or chemical instruments."

Mammals such as mice and humans are known to have unique genetically-determined body odors, called 'odortypes.' Thought to be identity biomarkers that help distinguish individuals from one another, odortypes are determined in part by genes of the major histocompatability complex (MHC). The same genes also are involved in the immune system.

Odortype information is transmitted through body fluids such as sweat and urine, which contain numerous airborne chemical molecules known as volatile organic compounds, or VOCs, many of which are odorous.

The type of food eaten also can influence an individual's body odor; garlic, for example can be detected by smell when consumed in large amounts. As such, dietary changes potentially could obstruct detection of genetically-determined odortype and thus mask individual identity. To address this question, the researchers conducted a series of behavioral

and chemical experiments.

In behavioral tests, 'sensor' mice were trained to use their sense of smell to choose between pairs of test mice that differed in MHC genes, diet or both. Chemical analyses used instrumentation to examine the array of VOC's in urine of mice having different MHC backgrounds and fed different diets.

The results indicate that genetically-determined odortypes persist regardless of diet, even though dietary changes do strongly influence odor profiles of individual mice. Changing diet ingredients did not obscure detection of underlying odortypes using either behavioral or chemical methods.

"These findings indicate that biologically-based odorprints, like fingerprints, could be a reliable way to identify individuals. If this can be shown to be the case for humans, it opens the possibility that devices can be developed to detect individual odorprints in humans," said lead author Jae Kwak, PhD, a Monell chemist.

According to Beauchamp, similar approaches are being used to investigate body odor differences associated with disease. Such research could lead to the development of electronic sensors for early detection and rapid diagnosis of disorders such as skin and lung cancer and certain viral diseases.

Source: Monell Chemical Senses Center