

Semipermeable membrane plays role in drug-sniffing system

May 10 2016, by Nancy Owano



Credit: Autoblog

A drug -sniffing car kitted out with advanced sensors that can pick up suspicious chemicals has made the news rounds this month; it can smell drugs a quarter of a mile away, said *Discovery News*.

Tracy Staedter of *Discovery News* said the researchers behind this are at the University of North Texas and their Membrane Inlet Mass

Spectrometry technology involves "an ultra-sensitive, air-sensing [system](#)."

MIMS is being described as a portable air testing system allowing for real-time analysis. "A semi-permeable membrane is at the heart of the system. It senses chemicals in the air, analyzes them using [mass spectrometry](#) and then produces real-time details on a computer display that anyone can read," said Staedter.

The researchers have tested the system by installing it in a Ford Fusion Energi. It was able to pick up chemical signatures covertly.

Dr. Guido Verbeck, an associate professor of chemistry and biochemistry, is a key mover behind this.

Beyond drug-sniffing for criminal investigation, other potential applications of this technology would be monitoring air and water quality for environmental research. In addition to the drug-sniffing car version, where the tool is built into a sedan, the creators also developed a smaller backpack version for testing water and air quality, said *Discovery News*.

Writing on the University of North Texas site showing research, Dr. Verbeck discussed MIMS as "a [technique](#) that incorporates a semi-permeable membrane selective for differing organic molecules and chemistries. This eliminates the need for time consuming sample preparation and facilitates near instantaneous analysis. With this tool, communities throughout the world, can have an inexpensive tool to analyze their oil and gas, mineral extraction, [water quality](#), clandestine lab locale, and other natural resources to best course a path for use of these resources."

Greg Walters in *VICE News* wrote about him and the work earlier this month. The prototype was made by equipping the silver 2015 Ford

hybrid sedan with an advanced mass spectrometer. To carry out testing, he set up a lab in a mobile home, emitting drug fumes through the vents. "When certain types of chemical strains are detected, the computer kicks on and starts calculating where that [strain](#) is coming from," Verbeck said. "Within a matter of minutes, the location is pinpointed within a 4 percent error."

The car picked up the chemical signatures from about a quarter mile away from the source.

Walters added interesting details about their invention. It relies on "an unusually rugged spectrometer," he wrote, an instrument found inside laboratories; the components are sensitive to physical vibrations and shocks. The Verbeck model uses a pump-shaft that levitates on powerful magnets, said Walters. This preserves stability even if travel occurs on rough roads. According to Verbeck *VICE News* Verbeck said that police departments and federal agents were calling to express interest in the tool.

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