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Artificial nose may save lives

Michael Wilmsen News Writer

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The difference between a lager beer and an ale beer is difficult to distinguish through smell alone. However, an artificial nose developed on campus can do exactly that and more.

The artificial nose works by visualizing smells before and after the nose is exposed to an odor. The project began more than 10 years ago by Kenneth Suslick, professor of chemistry and group leader, graduate students and post doctoral students.

"We have been using this to identify toxic gases to compare one to another," Suslick said. "We can tell apart 10 different commercial coffees and how long the beans have been roasted for."

He added that the artificial nose is a digital extension of litmus paper, which changes color to detect materials for acidity.

"We have developed an array of 36 different chemically responsive dyes smaller than a postage stamp," Suslick said.

The dyes change color depending on the odor they are exposed to. This change in color allows the person using the nose to identify a particular material.

Suslick said the nose is different from similar breakthroughs because it can distinguish subtle differences between smells. The invention, which has been published in scholarly magazines, such as "Analytical Chemistry," "Nature Chemistry" and "Chemical Communication," can eventually help save lives of people who work with hazardous materials, he said.

Those working with radiation wear badges that allow them to detect the amount of radiation they have been exposed to.

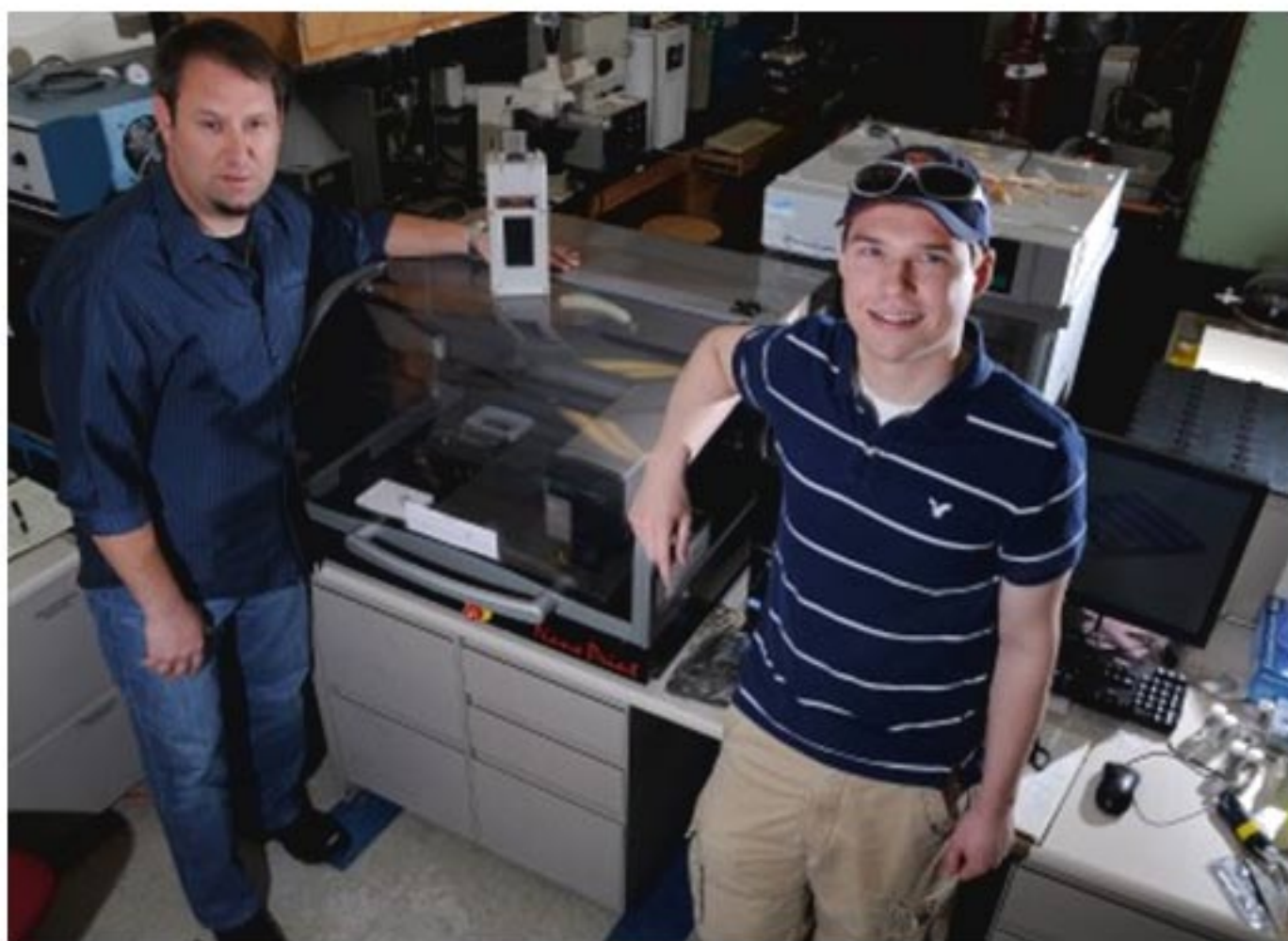
Suslick said he plans to use his invention to extend protection to people working with similar dangerous materials or toxic industrial chemicals, including ammonia, sulfuric acid and carbon monoxide.

"People that work with chemicals, not just chemists, but anyone in the industrial workplace has no way of monitoring what they have been exposed to in terms of chemical exposure," Suslick said. "So we would like to have a chemist's equivalent of a radiation badge."

This technology can also be used on campus in an emergency. In the event of a chemical spill or a fire, rescue workers and firefighters could use the nose to identify dangerous chemicals on site, said Jonathan Kemling, graduate student and project collaborator.

iSense, a company co-founded by Suslick and now located in Palo Alto, Calif., is beginning to commercialize this technology. The company is focused on developing real-world sensor devices.

"It has been fulfilling," said Christopher Musto, graduate student and project collaborator. "It's not often that you get to work on projects with real world applications that can actually make a difference."



Christopher Musto, left and Jonathan Kemling, both fourth year graduate students in materials chemistry, have been working on an "artificial nose" that has the ability to identify toxic chemicals in the air. The device is designed to assist first responders and industrial plants in identifying life-threatening chemical leaks.

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