

HIGH-TECH IDEA | Research done in Missouri

DRUG, BOMB 'SNIFFER' NEARS

Technology in development would "fingerprint" molecules in the air with small handheld unit.

By **TONY RIZZO**
The Kansas City Star

It promises to detect everything from the foul residue seeping from a meth lab to the dynamite strapped to a suicide bomber.

After a decade of research at the University of Missouri-Columbia, so-called Quantum Fingerprint technology could soon move from the laboratory to the front lines of the wars on drugs and terror.

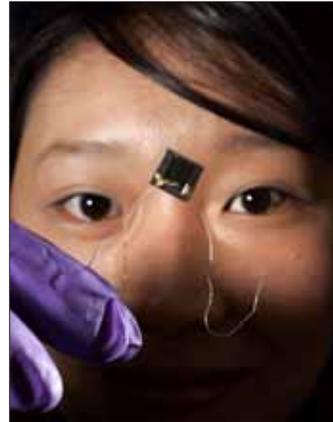
"We've done our homework and we're ready to roll," said David Salva, president of Independence-based United States Semiconductor Corp., which has licensed the technology and is developing it for

the marketplace.

The effort is being helped by a \$1.05 million grant announced Tuesday by U.S. Rep. Emanuel Cleaver.

Among those attending a demonstration at the Police Department's Central Patrol Division was Brandy, a black Labrador trained to sniff out evidence of arson. She seemed more interested in making friends than the possibility of losing her job if the device proves capable of what its developers say it can do.

Attempting to explain the technology to a roomful of nonscientists, researcher



University of Missouri-Columbia graduate student Annie Hsu displayed a sensor used in the Quantum Fingerprint.

Mark Prelas said it works much like the nose of trained dogs like Brandy, detecting and discerning chemical vapors.

The heart of the system is a computer chip coated with a diamond film, said Prelas, director of research at the university's Nuclear Science and Engineering Institute.

When an electric current is applied, the chip attracts molecules from the air. The molecules of each chemical have a specific energy or quantum "fingerprint," which is read and compared with samples collected in a database.

While Tuesday's demonstration used a desktop computer, a monitor and several modules the size of shoeboxes, Salva held up a hand-sized computer and said, "Our goal at U.S. Semi is to take all of that and put it in this or something like this."

Getting the technology from where it is today into the hands of police officers and others will cost up to \$5 million, Salva said, and take "nine to 18 months, maybe a tad longer."

Researchers and companies across the country have developed or are working on devices that perform similar functions. Typically, those devices detect explosives or drugs or chemical agents, but not all of them, as the Quantum Fingerprint system is supposed to do.

Also, Prelas said, Quantum Fingerprint is about 1,000 times more sensitive than many of the devices in use today.

Handheld detection devices typically cost tens of thousands of dollars. Salva estimated that handheld Quantum Fingerprint devices would sell for \$400 to \$500. They would be wirelessly connected to a central computer.

Law enforcement and homeland security functions are not the only applications for the technology. U.S. Semi has received a \$100,000 grant from NASA to use the technology for monitoring air quality in coastal areas of California.

Kansas City Police Chief Jim Corwin, who attended Tuesday's demonstration, said the technology could be a "marvelous tool from a crime prevention standpoint."

"It lets your imagination run wild," he said.

HOW IT WORKS

Researchers hope that improved technology and design will allow police officers, for example, to operate a handheld detection device to more quickly identify narcotics and explosives while in the field.

- 1 Device holds a specially coated computer chip.
- 2 Molecules in the surrounding atmosphere are attracted when an electric current is applied to the chip's surface.
- 3 The molecules of illegal substances have a specific "energy fingerprint," which is read and compared with previously collected samples in a database.

