Md. "It's absolutely amazing how quickly they did this."

Until now, ACE2 has largely interested cardiologists. Several decades ago, physicians began using inhibitors of a similar enzyme, ACE, to treat high blood pressure and heart disease. A few years ago, scientists discovered ACE2 and began to look for compounds that block its activities. There's a good correspondence between tissues that make ACE2—the heart, lungs, and kidneys, for example—and ones affected by the SARS virus, notes Farzan.

He and his colleagues are now looking into whether known ACE2 inhibitors block the SARS virus from cells. It's possible that these inhibitors may thwart ACE2's function but still allow the virus to grab onto the enzyme, cautions Farzan.

Gary Nabel, director of the National Institutes of Health Vaccine Research Center in Bethesda, Md., calls the new work a "fascinating discovery" but notes that the SARS virus may exploit proteins other than ACE2 as receptors. —J. TRAVIS

Electronic Thread

Fiber transistor may lead to woven circuits

Someday, the very fabric of your shirt might contain flexible electronic devices that monitor your vital signs or enable you to dial in the color or pattern you want to wear that day. Futuristic clothing of this sort may be closer to your closet now that researchers have developed a type of transistor-on-a-fiber.

Josephine B. Lee and Vivek Subramanian of the University of California, Berkeley say that the perpendicular arrangement of a fabric's fibers should make it possible to wire transistors such as these new fiber ones into sensing devices, wearable displays, and other electronic devices. Conductive wires among the fabric's threads would provide the transistor-to-transistor links.

Unlike conventional transistor fabrication, which takes place at elevated temperatures and requires high precision and ultraclean conditions, making fiber transistors is "totally compatible with the weaving process," says Lee. She's slated to present this new work at an international meeting on electronic devices next month in Washington, D.C.

The two researchers make their new transistors by coating hair-thin strands of aluminum with an electrically insulating film. Doing that requires oven temperatures, but the step is completed before weaving takes place. Atop the insulating film, the researchers deposit a layer of pentacene, an organic chemical that behaves as a semiconductor.

In the lab, the researchers have demonstrated another important step in making fiber-based circuits: By positioning threads across the fiber transistors, the Berkeley team can deposit thin films of gold on the fibers except in the tiny areas where the overlying thread masks incoming gold vapor. This process breaks the fibers into discrete transistor regions, each of which can be contacted individually with thin, metallic wires during the weaving process.

"Using the fibers of the textile as shadow masks points to a possibly inexpensive way of making transistors on fabric," comments Sigurd Wagner of Princeton University. On the other hand, pentacene transistors will require additional protective coatings to prevent degradation by moisture or exposure to the air, he notes.

For tasks such as sensing body temperature, even damaged transistors might work well enough, Lee says. She and Subramanian are now at work on the next step: weaving circuit-laden cloth from the new fibers. —P. WEISS

The Next MTBE

Contamination from fuel additives could spread

The recent political debates on the use of two common gasoline additives, methyl *tert*-butyl ether (MTBE) and ethanol, suggest that refiners may have to rely more on alternative chemicals for oxygenating gas and reducing smog.

A University of California, Los Angeles (UCLA) research group has compared the in-ground behavior of MTBE, four alternatives, and basic gasoline constituents, such as benzene. The researchers analyzed data on more than 850 leaking underground fuel tanks in the Los Angeles area, as well as measurements of those contaminants in groundwater at various distances from the tanks. They conclude that

at their present concentrations in gasoline, the alternative additives aren't as environmentally prevalent as MTBE, but that reformulations with higher concentrations could create problems comparable to those already caused by MTBE.

To meet air-quality standards implemented in the 1990s, many petroleum processors began adding compounds called oxygenates—for the most part MTBE, with ethanol as a distant second—to gasoline. The additives reduce emissions from burning fuel, but they also have environmental drawbacks.

MTBE, which smells like turpentine, often escapes from leaking gas-storage tanks and spreads in underground plumes. The contaminant persists in groundwater for years and is difficult to remove (*SN*: 4/8/00, p. 229). Some states now prohibit manufacturers from adding MTBE to gasoline to minimize pollution.

Ethanol is less persistent than MTBE in the environment, but it appears to enhance the diffusion of benzene, a carcinogen and a major ingredient in gasoline, when ethanol-enriched gas leaks from tanks.

Several oxygenates other than ethanol could supplant MTBE as the gasoline additive of choice. They are frequent by-products of MTBE production and therefore already present at low concentrations in MTBE-enriched gasoline.

UCLA's Tom Shih and his colleagues detected MTBE in the ground at 83 percent of the leaking tanks, making it nearly as prevalent as benzene. The oxygenate *tert*-butyl alcohol occurred at 61 percent of the sites, and the other three oxygenates—all ethers similar in structure to MTBE—turned up 9 percent to 24 percent of the time.

Half of the MTBE plumes exceeded 84 meters in length, while *tert*-butyl alcohol plumes were 61 m in median length. Typical plumes of the other ethers were 35 m to 58 m long. Shih and his colleagues report in an upcoming *Environmental Science and Technology*.

"All indications [nevertheless] suggest that the alternative ethers would pose groundwater contamination threats similar to MTBE if their scale of usage were expanded," Shih says.

The concentrations of alternative oxygenates found around leaking tanks in the new study are already surprisingly high, says environmental engineer Susan E. Powers of Clarkson University in Potsdam, N.Y. —B. HARDER

GOLD FINGERS The vertical threads of this tiny assembly contain the kinds of fiber-based electronic components that could one day become part of electronic textiles.