

OF NOTE

NANOTECHNOLOGY

Hooking up

Researchers have created molecules that spontaneously form sturdy networks on a surface, a step that could bring molecular-scale electronic circuits closer to reality.

Leonhard Grill of the Free University of Berlin and his colleagues synthesized flat, square molecules with arms extending from all four sides. The team engineered the molecules to be either reactive or inert at the tip of each arm, and then temporarily capped the reactive tips with bromine atoms.

Deposited onto a gold surface, the molecules slid around, nudged by random thermal jiggling. Heating the surface to 270°C for about 15 minutes drove off the bromine caps. As the molecules continued to wander, their reactive ends began to find one another and form stable, covalent bonds.

Versions of the molecules with just one reactive arm got together in pairs, while those with two or four reactive tips got together in chains and grids, respectively, the researchers report in the November *Nature Nanotechnology*.

Grill says that the method is more promising than other techniques for self-assembling molecules that rely on weaker chemical bonds. Other molecules could be engineered to form more-complex structures such as circuits, he adds. —D.C.

BIOMEDICINE

Earache microbe shows resistance

mococcal 7-valent combination by the seven pneumococci *S. pneumoniae*. But scientists have encountered *S. pneumoniae* not covered by the vaccine become impervious to the vaccine.

Janet R. Casey and colleagues of the University of Michigan report that one strain of the microbe was found in at least nine children in Michigan, resistant to all 18 drugs used in the vaccine use against middle-

childhood ear infections. The findings were published in the October 15 issue of the *American Medical Association*.

The new antibiotic, levofloxacin (Levaquin), is used to treat a wide range of microbial infections and was approved by the FDA in 2003.

Between 2000 and 2004, health officials in Michigan recorded a 10% increase in pneumococcal infections in children. In the same State of Michigan in 2004, scientists showed that a new strain of the microbe manifested as a middle-ear infection or meningitis.

Stephane T. Schmitt, a pediatrician at the University of Michigan Medical Center, says the trouble is not just for only children but also for adults with *S. pneumoniae*.

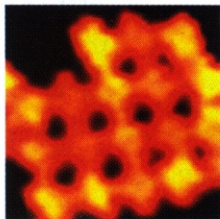
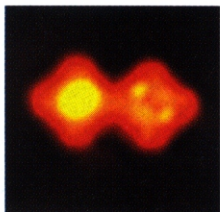
Massachusetts but also in Michigan in 2004. Pelton and his colleagues' data in the Oct. 19 issue of the *Journal of the American Medical Association Weekly Report*.

The *S. pneumoniae* has also shown up in Israel. "It's a dramatic finding," says —N.S.

EARTH SCIENCE

Groundwater adds CO₂

Using groundwater



LINKED IN Self-assembling molecules connect to form a pair (top) or a grid (bottom) in these electron microscope images.