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Researchers in La Jolla, California, have taken steps toward developing effective new antibiotic drugs. M. Reza Ghadiri and other researchers from the Scripps Research Institute have developed structures called "nanotubes." Nanotubes are molecules of amino acid that can build themselves into tubes that are smaller than a cell.

Mister Ghadiri' s team recently reported its findings in the publication, NATURE. The researchers said the nanotubes killed a number of bacteria in animals and in laboratory tests. They also reported that the structures helped mice recover from normally deadly bacterial attacks. These same bacteria resisted a traditional antibiotic drug used to kill harmful bacteria.

The team said the central structure of the nanotubes contains rings called cyclic peptides. These circular structures are made of either six or eight amino acids. The researchers chose the amino acids because their molecules form themselves into tubes only in the correct chemical environment.

During their experiments the researchers placed the rings inside the covering of bacteria. The rings lined up to form tubes that are empty in the middle. The tubes killed the bacteria by making holes in them. The bacteria died when the material inside them leaked out.

In test-tube experiments the team found nanotubes formed in bacteria but did not form in red blood cells. The amino acid nanotubes also protected animals sick with Staphylococcus Aureus. This disease affects more than two-million hospital patients in the United States every year.

Current antibiotic drugs often attack one special molecule within bacteria. Bacteria can develop resistance to such drugs over time. They do this by changing the shape of the targeted molecule. Or, they may keep the drugs away from their molecular target.

Mister Ghadiri says he hopes nanotubes have a long life. This would force bacteria to make more changes to resist treatment. He says changing amino acids in the peptide rings could create many different versions of the nanotubes.

Mister Ghadiri' s team has given mice the drugs by forcing them through the skin. But he believes these new kinds of antibiotics can some day be produced to take by mouth, in pill form.

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