Improved antibiotic coatings

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Bacteria have a natural ability to attach themselves to surfaces, both natural and synthetic. Once attached, they often work cooperatively to form biofilms, thin layers of bacterial colonies that can coat the surface of a medical device and introduce the risk of infection. As a result, orthopedic implants, catheters, and even contact lenses can become vehicles for infection.

Antibacterial materials on the surface can reduce the risk but generally these materials do not stick well to the devices. A research group at the University of South Australia is working on techniques to permanently bind antibacterial coatings to medical devices by binding them to a polymer layer. They present their research today at the AVS 57th International Symposium & Exhibition, which takes place this week at the Albuquerque Convention Center in New Mexico.

The Australian scientists start by applying a plasma polymer coating, a technique that works on many different base materials including glass, metal, and many polymers used in devices. This ultrathin film acts as a scaffold on which to bind materials that either signal the bacteria not to attach by interfering with the cell's attachment mechanism or that prevent multiplication once the bacteria are attached.

The presentation will compare several different antibiotics applied to the polymer film, including established antibiotic compounds, silver nanoparticles, and novel diterpene compounds derived from Australian plants that have been used in traditional medicine. Each approach has pros and cons that must be carefully weighed before using them on a

device implanted in the human body.

"We believe that no solution will be universal so we want to establish an array of approaches," says Hans Griesser of the University of South Australia. "The new diterpene compounds that we are testing are structurally quite different from established antibacterial compounds, and they are effective against methicillin-resistant *Staphylococcus aureus*. That is what got us excited about them."

More information: The presentation, "Some strategies and Results for Antibacterial Coatings" is at 2:40 p.m. on Tuesday, October 19, 2010. ABSTRACT: www.avssymposium.org/Open/Sear … aperNumber=BI1-TuA-3

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