

Researcher finds way to kill bacteria in tiny places like dental equipment

A powerful, effective chemical process that kills bacterial colonies in dental equipment and other hard-to-reach places has been developed by researchers at the LSU AgCenter. Dr. Donal Day, a microbiologist with the AgCenter's Audubon Sugar Institute, developed the procedure with Dr. John Mayo of the LSU School of Dentistry's Department of Microbiology, Immunology, and Parasitology.

Because it is water-driven, modern dental equipment provides an environment where bacteria can thrive, a problem similar to those faced in sugar mills. There are few effective methods for cleaning the narrow tubes used in dental equipment. They're plastic, so they can't withstand the heat used in sterilization, and there's no real chemical remedy to attack the resistant bacteria.

The process developed by Day and his colleagues stemmed from his work with dextran, a chain of simple sugars formed by microorganisms that causes sanitation problems in sugar processing systems. Some bacteria tend to grow on surfaces and protect themselves by building a slime layer — a biofilm — that helps

them stick to the surfaces and protects them from penetration by outside elements. Dextran is a result of a biofilm made by some of these bacteria.

Although these thin layers of microorganisms can show up on almost any surface, they're particularly a problem in concealed places like the insides of pipes and tubes. It's difficult to get inside and scrub the surfaces, and flowing liquids slide right over the slime layers. Although bacteria can grow in any environment, they do better in static water than in flowing water, so downtime on the dental equipment causes increased problems. Day and his colleagues developed a chemical combination that first strips the biofilm from the bacteria and then kills the bacteria with disinfectant.

In dental equipment, the solution is injected into the water system at the end of the day and then flushed out the following morning. It's effective against organisms

in films where normal cleaning isn't effective. This is particularly important because the pathogens that produce biofilms can be more virulent and resistant to normal remedies.

Although the patented chemical process was first used with dental equipment and has a bright future in those applications, the process can be put to a wide variety of uses. The chemical combination is safe enough to put in a standard spray bottle and used to clean most any surface. Because the process is so effective and works within 60 seconds, the potential uses are almost unlimited.



Because it is water driven, modern dental equipment provides an environment where bacteria can thrive. But a new process developed by the LSU AgCenter can control bacterial colonies in dental equipment and other hard-to-get-to places.