

Medical Tubing Solution for Bacteria Prevention

A covalent link used in conjunction with existing medical tubing to reduce/eliminate the growth of pathogenic bacteria in both medical and non-medical applications.

Georgia Tech inventors have proposed a covalent linkage of known and novel anti-microbial compounds to existing medical tubing to reduce/eliminate the growth of pathogenic bacteria on this material. Using endotracheal tubing as an example (Covidien Mallinckrodt cuffless endotracheal tubing, 4.00 mm ID), we first modify the surface with an azide functional group, followed by covalent attachment of anti-microbial agent via the Cu-catalyzed azide-alkyne cycloaddition (CuAAC) reaction. These materials will then be tested for bacterial adhesion using hospital-relevant strains: *P. aeruginosa*, *S. aureus*, *E. coli*. This method will allow us to screen a variety of different modifications in a time-efficient manner to develop an alternative strategy to minimizing biofilm and colonization of bacteria on medical tubing.

Summary Bullets

- Prevent various infections currently impacting patients due to bacteria formation on medical tubes.
- Solution that can be utilized with existing medical tubes.
- Does not leach any materials from the tubing surface.

Solution Advantages

- Prevent various infections currently impacting patients due to bacteria formation on medical tubes.
- Solution that can be utilized with existing medical tubes.
- Does not leach any materials from the tubing surface.
- Inexpensive to produce.
- Potential applications in various industries beyond the scope of the medical field.

Potential Commercial Applications

- Potential FDA approved medical tubing solution for pediatric and general medical use.
- Potential for non-medical applications such as in soda machines to avoid bacterial contamination and clogging.

Background and More Information

Numerous conditions, including ventilator-associated pneumonia and catheter-related urinary tract infections, are linked to the formation of biofilms and colonization of bacteria on medical tubing, which then leads to a bacterial infection. These conditions are associated with high mortality rates, as well as increased hospital stay lengths and medical care costs. Currently, using silver-coated tubing is the main effort to minimize these infections in intubated patients, however, this is not FDA approved for pediatric use.

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