# The Use of Iron-Containing Nanomaterials as Antimicrobial Agents

Published date: Aug. 4, 2015

## Technology description

Novel method for antimicrobial treatment.
This antimicrobial treatment process results in significant destruction and killing of biofilms. This technology can have an immediate impact in applications such as surgical sutures, catheters, respirator parts, as well as treatment for bacterial infections.

## Background

Biofilms are complex functional communities of one or more species of microbes which stick to one another or onto a solid surface. These communities are hierarchically arranged and three dimensionally organized in order to gain ecological advantages compared to their planktonic counterparts for better survival. These include protection from the environment, nutritional availability and metabolic cooperation, acquisition of new genetic traits and antimicrobial resistance. According to the National Institutes of Health (NIH), biofilms are responsible for over 80 % of all microbial infections in the body. These include chronic wound infections, chronic lung infections associated with cystic fibrosis, chronic osteomyelitis, endocarditis, urinary tract infections, dental and periodontal infections, eye infections, and gastrointestinal tract infections. Biofilms can also grow on medical devices and cause infections with ventilator and tracheal tubing, prosthetic joints, heart valves, cardiac pacemakers, and catheters. Scientists continue to study how micro communities live, interact, and die in an effort to mitigate harmful impacts. Yet, there remains a present need for new solutions to control, disinfect, or prevent the growth of such biofilms.

## Technology Description

Researchers from the University of New Mexico and the University of Texas at Austin have developed a novel method for antimicrobial treatment. This antimicrobial treatment process results in significant destruction and killing of biofilms. This technology can have an immediate impact in applications such as surgical sutures, catheters, respirator parts, as well as treatment for bacterial infections.

## Application area

Inhibition of bacterial growth and biofilm formation
Nanoparticle-drug conjugates may overcome the antibiotic drug resistance common inP. aeruginosainfections
These nanomaterials hold promise as a low-toxicity option for treating drug-resistant strains
May be used in addition to silver nanoparticles or as a silver alternative
Applications as antibacterial coatings for touch-screens, surgical sutures, indwelling catheters, stents, respirator parts, or as a treatment for bacterial infections

## Institution

The University of New Mexico

## Inventors

H. M. H. Nihal Bandara
Marek Osinski
Leisha Marie Armijo
Hugh Smyth

手 机 : 13414935137
邮 箱 : yeyingsheng@zf-ym.com