A Natural Molecule for Inducing Dispersion of Microbial Biofilms

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Technology description

A novel dispersion inducing agent for microbial biofilms
Bacterial biofilms have been implicated in more than 80 percent of chronic inflammatory and infectious diseases, including ear infections, native valve endocarditis, urinary tract infections, burn and non-healing wounds and infections of indwelling medical devices. Biofilms are also the principal cause of biofouling, a persistent problem in marine and industrial environments. Biofouling affects food processing, water purification and distribution, the pharmaceutical and petroleum industries, as well as essentially all other industries having materials exposed to water. Biofilm cells differ from their planktonic counterparts in the genes and proteins they express, resulting in distinct phenotypes that include altered resistance to biocides, antibiotics and the human immune system.
The current invention developed by researchers at Binghamton University is an agent that induces biofilms to disperse. Because the agent acts as a signaling molecule giving the cells a positive signal to disperse, a very small active concentration is needed compared to standard dispersion agents. Upon dissolving the biofilm, the infection can thereby be treated using standard drugs. Inclusion of the agent with known antibiotics has been shown to increase the efficacy of these drugs considerably. The drug is safe for human consumption in the concentrations used and can furthermore be attached to surfaces of medical instruments and incorporated into surface coatings. As such, the agent has a variety of commercial applications ranging from treatment of infectious diseases, health and hygiene, and medical devices, to anti-fouling in various industrial processes including food processing.
KEY ELEMENTS
Causes dispersion of biofilms and prevents formation of biofilms
Active against a variety of microorganisms, including gram-negative and gram-positive bacteria as well as fungi
Increases the efficacy of antibiotics and microbiocides
Active at low concentrations (nanomolar)

Application area

Treat infection

Wound healing
Oral hygiene
Skin care
Medical devices
Food processing
Surface coatings
Anti-corrosion

Advantages

Active against a variety of microorganisms (gram-negative bacteria, gram-positive bacteria, as well as fungi)
Gives the cells a positive signal to disperse
Can be combined with widely used antibiotics
Active at very low concentrations (nanomolar)
Inexpensive
Safe

Institution

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