

Broad spectrum biofilm inhibition by a small bacterial peptide

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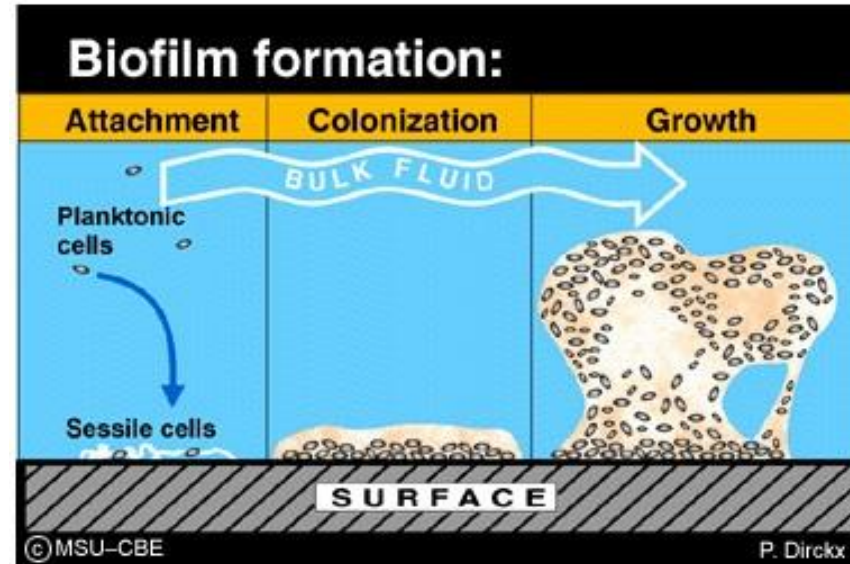
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Biofilms

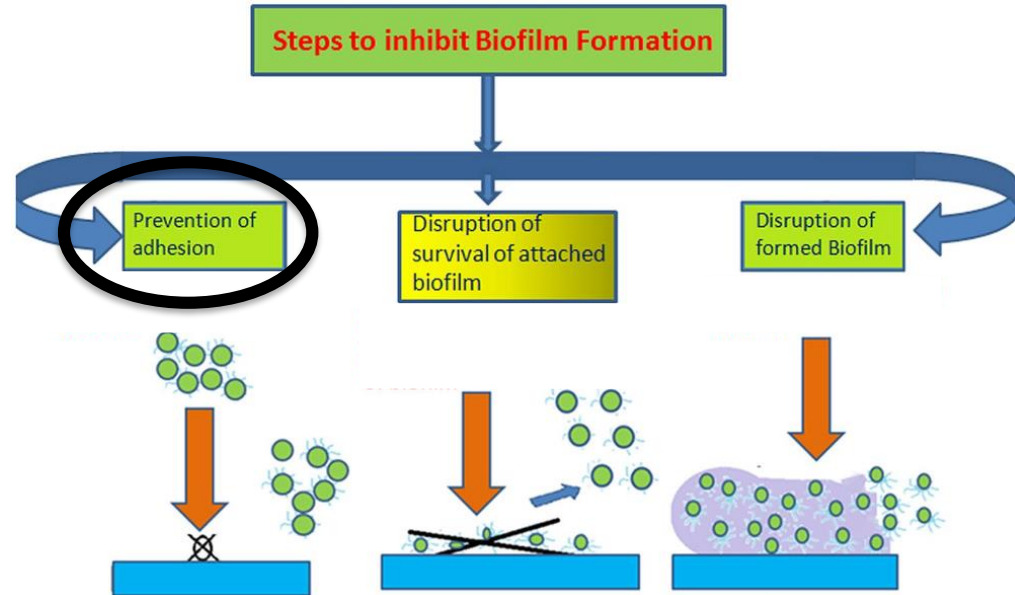
- Biofilm infections, such as pneumonia in cystic fibrosis patients, chronic wounds and implant- and catheter-associated infections, affect millions of people in the developed world each year and many deaths occur as a consequence
- Estimated that most of the bacterial infections in humans are correlated with biofilm and about 50% of the hospital infections are biofilm derived
- Clinical Problem:
 - Currently removal relies on abrasive mechanical disruption and harsh chemicals
 - A major goal of medical and industrial biofilm research is to prevent biofilm formation from occurring in the first place



Inhibition of biofilm formation

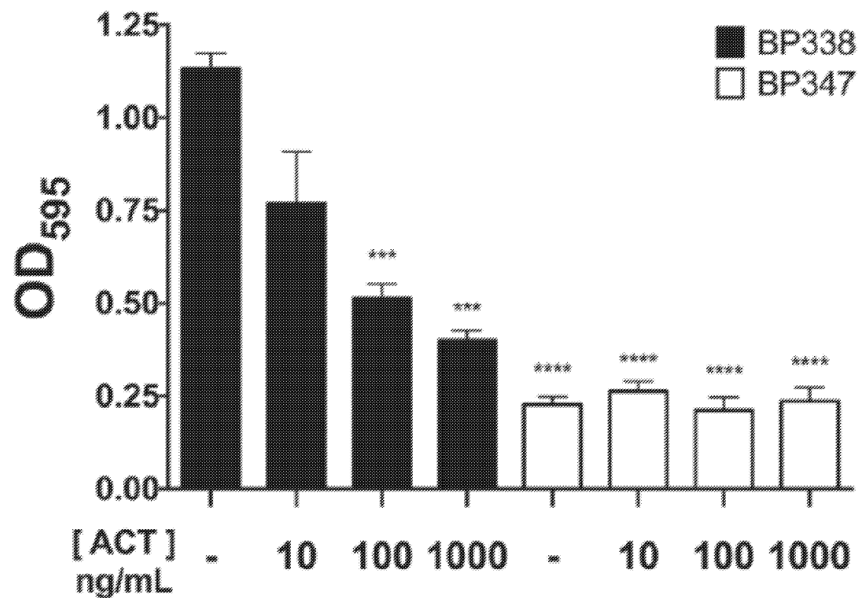
Solution: Researchers at the University of Virginia have identified a *Bordetella* adenylate cyclase toxin (ACT)-derived peptide that inhibits biofilm formation

- Broad spectrum inhibitor
- Small size of peptide makes it more soluble and deliverable
- Potential treatment option for antibiotic-resistant biofilms
- Represents a novel regulatory mechanism and has major clinical, environmental and industrial applications



Archives of Microbiology, 2016. Gupta et al.

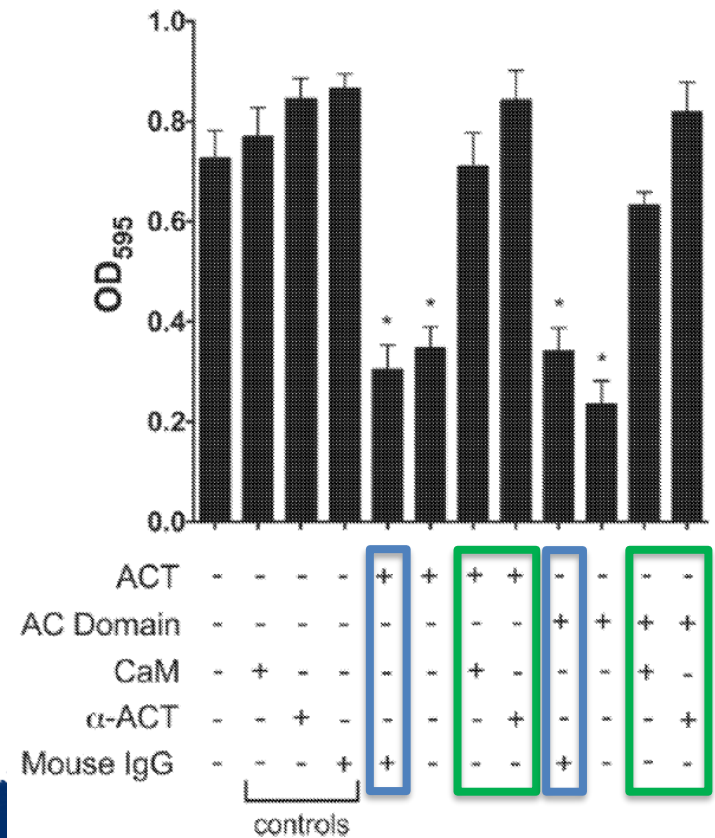
ACT inhibited biofilm in a concentration-dependent manner



Biofilm formation of BP338 (wild-type *B. pertussis*) and BP347 (negative control, Bvg(-) *B. pertussis*) in the presence of increasing concentrations of recombinant purified ACT, as measured by a crystal violet assay at 96 hours.

Anti-ACT antibodies block ACT inhibitory effects

ACT or the AC domain of ACT was added to bacterial cultures along with inhibitory antibodies (CaM and α -ACT) and negative control (Mouse IgG) and the biofilm formation was measured by a crystal violet assay at 96 hrs.



Relevant Publications

- **Mol Microbiol. 2017 Jan;103(2):214-228. Hewlett E, et. al.**

Intellectual Property

- UVA Tech ID: HEWLETT-BIP
 - Title: Compositions for inhibiting formation of and/or disrupting bacterial biofilms and methods of use therefor
 - PCT Application PCT/US2017/026012 filed Apr. 4, 2017