

Small Molecules for Treating Clostridium perfringens-related Bacterial Infections

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ABSTRACT

Researchers at the University of California, Davis have developed a method of treating infections caused by Clostridium perfringens bacteria - via inhibiting the bacteria's normal quorum sensing processes.

FULL DESCRIPTION

Bacterial resistance to antimicrobial compounds has become a serious threat to human health globally –therapeutic strategies that circumvent the emergence and spread of pathogens that are resistant to common antibiotics are needed urgently. One such approach is an attempt to interfere with a bacteria's own "internal" communication systems (also known as "quorum sensing" systems).

Clostridium perfringens can reproduce rapidly and is generally resistant to many common antibiotics. In addition to mild food poisoning and other gastrointestinal distress, more severe illnesses triggered by C. perfringens include septic shock and necrotic tissue infections such as "gas gangrene." This form of gangrene often develops in post-surgical infections or other wounds depleted of blood supply.

Researchers at the University of California, Davis have developed peptides and peptidomimetics that inhibit the production of virulence factors in C. perfringens and other pathogenic clostridia. These inhibitors interfere with quorum sensing in C. perfringens by mimicking the bacteria's own signaling peptides – which then prevents the bacteria from determining accurate information about its own population densities. The net result is a significant reduction in bacterial toxin production.

Because interference with the bacterial virulence factors does not aim to eradicate the bacteria, this technology does not exert a strong selective pressure on the bacteria. Thus, this therapeutic approach may decelerate the emergence and dissemination of antibiotic resistant mutant strains. As such, the use of this technology can overcome the shortcomings of antibiotic treatment alone.

APPLICATIONS

- ▶ Alternative or complement to antibiotic treatment in gas gangrene or other infections caused by Clostridium perfringens bacteria

FEATURES/BENEFITS

- ▶ Reduces virulence and toxin production triggered by the presence of C. perfringens
- ▶ Applicable for use in animals or humans A
- ▶ Approach does not promote antibiotic resistance

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Published Application	2022007208	03/10/2022	2020-549

Additional Patent Pending

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OTHER INFORMATION

KEYWORDS

Antibiotic resistance,

Clostridium perfringens,

bacteria, gangrene,

quorum sensing, QS,

accessory gene regulator,

Agr peptidomimetic

CATEGORIZED AS

- ▶ **Biotechnology**
 - ▶ Health
- ▶ **Medical**
 - ▶ Disease: Digestive System
 - ▶ Disease: Infectious Diseases
 - ▶ Therapeutics
- ▶ **Veterinary**
 - ▶ Therapeutics

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