



Novel Antibacterial Agents That Modulate Quorum Sensing and Are Effective at Physiological pH

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WARF: P09045US02

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The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing novel quorum sensing inhibitors that are effective at physiological pH.

Overview

Quorum sensing is a process used by some bacteria to coordinate behavior based on local population density. To communicate, bacteria release signaling molecules into the environment. When a certain number of signaling molecules accumulates and the population reaches a sufficient density, the bacteria change their behavior to work together for a common goal. For example, they may adapt to the nutrients that are currently available, defend against other microorganisms or protect themselves from toxic compounds.

Agents that interfere with quorum sensing may reduce the virulence of certain types of pathogenic bacteria. When bacteria cannot work together to coordinate their attack, the likelihood of infection decreases. However, many agents that affect quorum sensing are hydrolyzed readily at physiological pH and thus are not practical in a clinical environment.

The Invention

UW-Madison researchers have developed a set of novel agents that modulate quorum sensing but are not hydrolyzed readily at physiological pH. These compounds are mimics of the native quorum sensing signals used by Gram-negative bacteria, called *N*-acylated L-homoserine lactones (AHLs). Non-hydrolysable heterocycles were used to replace the lactone head groups of the AHLs.

Applications

- Antimicrobial therapeutics
- Antimicrobial coatings for medical devices, industrial equipment and marine vessels
- Promoting beneficial bacterial activity, such as the formation of biofilms for use in bioremediation
- Regulating the virulence, biofilm production or symbiotic behavior of quorum sensing bacteria

Key Benefits

- Reduces the likelihood of hydrolysis at physiological pH
- Compounds are active for longer periods of time than natural lactone analogs, but still lose activity in a time-dependent fashion.
- Because quorum sensing inhibitors have virulence-attenuating but not cell-killing effects, they do not select for drug resistance in bacteria and are likely to remain effective for longer periods of time.
- Compounds may promote or inhibit quorum sensing.

Additional Information

For More Information About the Inventors

- [Helen Blackwell](#)

Related Technologies

- [WARF reference number P05282US describes other compounds that modulate quorum sensing.](#)

Related Intellectual Property

- [View Continuation Patent in PDF format.](#)
- [View Continuation Patent in PDF format.](#)

Tech Fields

- [Therapeutics & Vaccines : Anti-infectives \(antibacterials, antifungals, antivirals\)](#)

For current licensing status, please contact Rafael Diaz at rdiaz@warf.org or 608-960-9847