Heteroresistance Antibiotic Resistance Testing

EXECUTIVE SUMMARY

TEAM

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FUNDING
$222K Emory/Georgia Tech Biolocity Grant

INTELLECTUAL PROPERTY
Patents pending (PCT)

Technology available for licensing and partnership

STATUS
Benchtop Testing

TECHNOLOGY

Antibiotic susceptibility testing (AST) is the universally accepted method for evaluating antibiotic resistance and is used to aid physicians in choosing the most optimal antibiotic agents for their patients. AST systems classify bacteria as resistant or susceptible, but are not sensitive enough to accurately classify instances in which only minor subpopulations of cells within the population are resistant (heteroresistance). The inadequate sensitivity to detect many instances of antibiotic resistance prevent effective treatment regimens from being designed.

This technology aims to identify heteroresistant microbes by more precisely analyzing bacterial populations. Once heteroresistance has been identified, the testing platform will suggest optimal combinations of antibiotics to more effectively eradicate the bacterial infection. Implementing this tool would allow a more precise selection of antibiotic combination therapies tailored to a specific patient.

CLINICAL NEED

Antibiotic resistance is rising to dangerously high levels in all parts of the world, affecting global health, food security, and development. With the emergence of numerous antimicrobial resistant infections, physicians find it increasingly difficult to treat common infectious diseases. According to the World Health Organization (WHO), a growing list of common infections – such as pneumonia, tuberculosis, blood poisoning, gonorrhea, and foodborne diseases – are becoming harder, and sometimes impossible, to treat as antibiotics become less effective. The Centers for Disease Control (CDC) stated that, in the United States alone, over 2 million patients are affected with antibiotic-resistant infections resulting in costly hospitalizations and at least 23,000 deaths every year. The patients suffering from infections caused by these drug resistant bacteria often have poorer clinical outcomes and consume more health-care resources than patients infected with nonresistant strains of the same bacteria. Antimicrobial resistant infections cause 700,000 deaths annually across the globe, a number that is projected to increase significantly in the coming years.

The technology is a testing platform that quickly and effectively identifies combinations of antibiotics to treat patients suffering from highly resistant infections.

STATUS

To date the team has validated their combination treatment approach in vitro and in a rodent model. They have also completed real time in vitro testing for several patients with extremely drug resistant infections, where the resulting data successfully guided clinicians in using the combination treatment strategy.

Next steps include validating the technology measuring 400 clinical isolate-drug pairings and comparison tests against the gold standard

For more information on this technology email biolocity@gatech.edu or contact:
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