Docket #: S21-097

A fluorogenic assay for rapid screening of lactam resistant bacteria pathogens

Stanford inventors have developed a rapid fluorogenic assay for screening of lactam resistant bacterial pathogens. ?-lactam antibiotics are considered to be the most successful class of antibiotics for treating bacterial infections. However, ESBL-positive bacteria and carbapenem resistant bacteria can produce enzymes to breakdown ?-lactam antibiotics into ineffective metabolites, which significantly reduces the effectiveness of ?-lactam antibiotics.

The current diagnostic standard for ?-lactam resistant infection is conventional phenotypic antimicrobial susceptibility testing (AST). Unfortunately, this method requires considerable effort and takes 1-2 days, which is too long for most clinical needs.

The invented fluorogenic assay uses novel N-lactam caged 3,7-diesterphenoxazine probes, CDA and CDA2, with a cascade activation mechanism. This assay enables detection of ?-lactam resistant bacteria within 2 hours and high detection sensitivity. This greatly reduces the diagnostic time and enables more suitable selection of treatment for bacterial infection.

Stage of Development
Early Stage

Applications

- Bacterial infection diagnosis
- Selection of treatment for bacterial infection

Advantages

- Fast and easy-to-use
- Automated and high throughput
- Low cost

Publications

- Xie, J. et al. A dual-caged resorufin probe for rapid screening of infections resistant to lactam antibiotics. *Royal Society of Chemistry* (2021), 12, 9153-9161.

Patents

- Published Application: WO2022217088
- Published Application: 20240240226

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