Palo Alto Research Center

Thermo-Optical Antimicrobial Susceptibility Test (TOAST)

Rapid characterization of bacterial antibiotic susceptibility patterns enables timely and optimal treatment decisions by health care providers, which reduces the emergence of drug-resistant strains, and in turn helps public health officials prevent the spread of drug-resistant strains. We propose to demonstrate a new calorimeter technology, Thermo-Optical Antimicrobial Susceptibility Test (TOAST), for use in an inpatient setting that uses optical detection of temperature changes arising from growth of microorganisms in coated standard clear bottom 96-well microtiter plates to provide real-time monitoring of antibacterial susceptibility. This technique will reduce the time for AST in secondary cultures to < 2 hours. The high resolution of the readout will enable detection of growth at lower culture densities (limit of detection (LOD) ≈10^6 CFU/ml) than current optical based measurements of broth microdilution tests (LOD ≈10^7 CFU/ml). TOAST will provide a true phenotypically determined MIC in a time frame similar to PCR gene detection.