

Development of Deep Learning Models for Sub-Cellular Fluctuation Imaging (SCFI): a 30-minute antibiotic susceptibility test for Urinary Tract Infections

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Abstract

We have developed a phenotypic and label-free Antibiotic Susceptibility Test (AST) termed Sub Cellular Fluctuation Imaging (SCFI). SCFI is an advanced machine-learning enabled microscope that monitors real-time changes of intracellular activity in response to antibiotics. By quantifying changes in the magnitude and location of light scattering caused by subcellular movement, we can detect metabolic changes that occur when bacteria are exposed to antibiotics. Here, we show that SCFI’s Deep-Learning models correctly classifies metabolic cell states for *E. coli* (exponential, stationary, dead) and susceptibility of Uropathogens with standard of care antibiotics.

Results

