

Fry Laboratories

Antimicrobial Resistance Detection by Next Generation Sequencing

As a direct result of limitations by current laboratory testing methods, each year thousands of individuals die from bacterial infections primarily due to misdiagnosis, delays in appropriate treatment, and ineffective treatment for antibiotic resistant bacteria. Existing microbial identification and antibiotic susceptibility relies on microbial culture, which may require many days and has been the standard technology used for decades. These methodologies suffer from cultivation bias, whereby uncultivable organisms are effectively undetectable, and the technology is unable to rapidly identify unexpected or novel resistance. We plan to directly address these limitations and deficits through strategic application of Next Generation Sequencing (NGS) that simultaneously eliminates cultivation bias and identifies antibiotic resistance and susceptibility of organisms more rapidly than current methods, with results in 12 hours or less. The diagnosis of blood stream infections (BSIs) in hospitals represents one of the prime applications for this technology; where by accurate, unbiased, and rapid diagnostics is critical for a favorable patient outcome. As proposed, this technology would completely alter today's microbial diagnostics by giving clinicians the information necessary to treat patients earlier with the appropriate antibiotic.