GeneCapture

"CAPTURE"-- Confirming Active Pathogens Through Unamplified RNA Expression

Growing antimicrobial resistance, imminent concerns related to pandemic management, and urgent and costly healthcare acquired infection (HAI) challenges have raised the awareness and demand for **rapid, affordable, portable** *in vitro* diagnostics (IVDs), which is the purpose of the AMR Challenge.

GeneCapture, Inc. is developing a new platform technology to address these requirements. Our patented technique "***CAPTURE" – Confirming Active Pathogens Through Unamplified RNA Expression*** uses a combination of universal and specific nucleic acid captors that rapidly hybridize with pathogenic RNA to quickly, affordably and directly identify the pathogens in a patient sample. Our mission is to screen human samples for dozens of pathogens in a portable Point-of-Care (POC) 1-hour assay with consumable costs of less than $20. Additionally, we propose to use our gene expression screening capability to develop a novel technique "***CARE" – Confirming Antimicrobial Resistance Expression***, which will allow the same device to be used simultaneously or sequentially to determine the antibiotic susceptibility of the identified pathogen. A brief incubation with antibiotic has little effect on the gene expression of resistant organisms, but causes major gene expression changes in susceptible ones. With improvements in limit of-detection (LOD), the CAPTURE assay should be able to find these "death-response" messenger RNA (mRNA) changes and identify whether an antibiotic is appropriate for treatment within 90 minutes. The GeneCapture team has developed the CAPTURE technique into a lab-based prototype, the CapLab, that is providing **preliminary results with both spiked and discarded, de-identified urine samples** for the development of our first commercial application, a rapid POC diagnostic for urinary tract infections (UTI). The preliminary work we have performed on a UTI panel is very relevant to the AMR Challenge and some of those data are presented herein. GeneCapture also plans to pursue acute respiratory tract infection (ARTI) and skin and soft tissue infection (SSTI) panels. Together with UTIs, these three conditions account for two-thirds of the annual ambulatory-care antibiotic prescriptions [1], and present a tremendous opportunity for improving antibiotic decision-making by healthcare providers to reduce inappropriate use of antibiotics.