

## Affinity Biosensors

### *Ultra-Rapid Phenotypical AST by Microbe Mass Measurement*

The spread of antibiotic resistance can be slowed by reducing the time needed to administer an effective, targeted antibiotic to infected patients. Our response to the AMR Challenge is to produce a test that both confirms bacteremia caused by highly resistant strains, and provides a complete phenotypical antibiotic susceptibility test (AST) in a time that is radically shorter than today's clinical standard. The test employs a microfluidic sensor that counts and weighs individual microbes at high throughput, and robustly measures bacterial culture growth at a speed limited only by the growth of the microbes themselves. It will provide clinically actionable information - confirming the presence of highly resistant bacteria and identifying the best targeted therapies - in hours or even minutes, *vs.* the current standard of 2-3 days. The initial targets will be CRE and ESBL-producing enterobacteriaceae, but the test will be extensible to all high-value bacterial targets and any desired antibiotics, and to a variety of bodily sources of infection (e.g., bacteremia/sepsis, spinal and pleural fluid, urinary tract, etc.) Because it assesses growth phenotypically, the test will not be defeated by evolving resistance mechanisms, and will provide an essential complement to resistance biomarkers and organism identification. The outcome will be the fastest possible sample-to result phenotypical susceptibility test, with the potential to migrate from a laboratory/in-patient setting to the doctor's office.