Day Zero Diagnostics

Sequencing of Bacterial DNA using Rapid, Low-cost Nanopore Sequencing Technology

Day Zero Diagnostics is developing a five-hour *in vitro* diagnostic that performs both species identification (ID) and antimicrobial resistance (AMR) determination directly from patient samples using a microfluidic bacterial enrichment device integrated with downstream wholegenome sequencing and sophisticated real-time analysis. Our initial clinical application is blood stream infections, since sepsis and other severe bacterial infections affect over 750,000 Americans annually, resulting in a 28% mortality rate and $16 billion in health care costs due to delays and difficulties in diagnosis. Instead of relying cultures, which can be slow and sometimes fail to grow, our solution isolates bacterial cells directly from a clinical sample using a disposable microfluidic cartridge. If a bacterial infection is confirmed, the device then sequences the bacterial DNA using rapid, low-cost nanopore sequencing technology. The resulting genomes are analyzed using our cloud-based analytics platform that uses a proprietary machine learning algorithm trained on our large reference database, which combines bacterial genomic sequences with their phenotypic resistance profiles and clinical metadata. The diagnostic provides the physician with both the species ID and the AMR profile within hours rather than days.