Sequencing
Pathogen Detection Tech Aims to Modernize Microbiology

There are more infectious diseases than there are symptoms — just ask any studious hypochondriac with an Internet connection. But diagnosticians, even with their years of training, can be stumped when making a differential diagnosis on the fly. Sending off for lab results winnows the pile of possible diagnoses, but such a process is time consuming, labor intensive, and expensive.

MultiGen Diagnostics is trying to change this scenario. The diagnostics service and biotechnology company, with offices in San Diego and Saskatoon, has created a platform technology they say is capable of unequivocally identifying pathogens at the root of infectious diseases. The technology is multiplex sequencing-based, so it is capable of returning more fine-toothed details on microbial subtypes and strains at the root of particular diseases.

Roger Hodkinson, chair of MultiGen's parent company, Bio-ID Diagnostics, says that the sequencing platform meets a need in clinical medicine for "much better, timely reporting that reflects clinical utility." He notes that typical microbiology methods of pathogen detection, such as serology or culture work, take more time than is ideal for making diagnoses and initiating treatment. Moreover, "DNA-probe technology is notorious for false positives," Hodkinson adds, "and conceptually it is no different from ELISA."

MultiGen's technology, developed by Thuraiaya Vinayagamoorthy, generates electropherogram readouts of distinct nucleotide sequences from a mixture of targets. Sequences generated by the technology are verified online via GenBank, and the system includes internal positive controls for each sample. The system can detect sequences of approximately 25 to 50 nucleotides — all that's needed to pinpoint unique microbial signatures — so it can be used to narrow a list of suspect bacterial, viral, fungal, or parasitic pathogens in a single test, Hodkinson says.

The company has already developed 25 "syndrome-driven panels" for the screening and identification of pathogens and their subtypes. These custom test panels run the disease gamut from infectious diarrhea to meningitis. Results for any panel can be generated eight hours after the sample is received, Hodkinson says. MultiGen is still in the process of pricing the tests, but Hodkinson predicts that the cost per panel will be "well within the current reimbursement schedule."

As the platform is capable of simultaneously sequencing multiple DNA or RNA targets, Hodkinson sees its potential for use in molecular epidemiology, drug discovery, and splice variant analysis, in addition to infectious disease identification. "We really do believe that MultiGen is a blockbuster technology that's going to radically change the way clinical medicine is done," he says.

— JL Crebs