

# Technique speeds up detecting, treating wound bacteria

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For Dr. Sydney Finegold, research is like reading a really good mystery or detective story. "But it is real life and one can see the results in one's own patients," he said. "So, one can have great fun while accomplishing worthwhile things."

With a grant from the Department of Defense, Finegold has taken his passion for research and applied it to a problem that affects civilians as well as injured service members: wound bacteria.

"The flora of wound infections is very complex," he said. "At times there can be 12 or more organisms present, and most clinical laboratories are not proficient in isolating and identifying anaerobes, which often predominate."

Using DNA detection methods through a technique called real-time polymerase chain reaction, the physician-researcher from the West Los Angeles Veterans Administration Medical Center can drastically cut the time it takes for lab personnel to figure out just what bacteria they're dealing with.

"The big advantage of real-time PCR is that we get quantitative information and accurate identification on the organisms in five hours or so, whereas the current procedure--culturing and identifying organisms by biochemical activity, etc.--can take one to several days and sometimes weeks, depending on the organism," he said.

His technique is also useful in detecting flora that can't easily be grown in culture because no one's been able to determine just what the bacteria like in the way of nutrients and environmental conditions.

The earlier the lab staff has answers, the earlier the correct treatment can begin. Initial treatment is necessarily empiric.

"When the patient is quite ill, clinicians necessarily use a broad spectrum (antibiotic), hoping not to overlook anything," Finegold said. "The resulting overuse of antibiotics definitely contributes to antibiotic resistance."

According to the Centers for Disease Control and Prevention Web site, antibiotic resistance is a growing threat to the general population, as well as the military. In fact, more than 70 percent of the bacteria that cause hospital-acquired infections are resistant to at least one of the drugs most commonly used to treat them.

So far Finegold and his colleagues have been able use real-time PCR to detect 20 of the most common bacteria found in wounds, including one, *Finegoldia magna*, which had been named after him in the past. A World War II and Korean War veteran who confesses he's had an "ongoing love affair with anaerobes for several decades," Finegold has two additional eponymous bacteria--*Alistipes finegoldia* and *Bacteroides finegoldii*--that will probably also be found in wounds but aren't part of those detectable by PCR. Yet.

"We will definitely add to the list," he said. "We are currently basing our selection of organisms to detect (through real-time PCR) on the current literature on surgical infections, but we expect to find many more organisms with the molecular techniques we will use."

Finegold's research endeavors were funded, in part, by a grant from the

DoD's Peer Reviewed Medical Research Program. Congress created the program in 1999 to promote research in health issues the military faces. Since its inception through 2005, the program has spent almost \$300 million to fund nearly 200 projects in a range of medical topics, including combat casualty care and technology and infectious disease research.

Though Finegold's research funding comes from the Defense Department, his results will help both military and civilian patients.

"Most of us in infectious diseases are looking for ways to speed up microbiologic results so that we can treat more intelligently from the beginning," he said. "We see surgical wound infections commonly, and when the DoD put out a request for proposals it was an opportunity to get good funding so that we could make some headway in this important area."

Finegold's study is a four-year project, and his team is awaiting approvals to test the real-time PCR detection method on actual patients. As his work progresses, he hopes to publish early results that may be put to use in both civilian and military hospitals, if and when it's feasible.

For more information on the DoD's Peer Reviewed Medical Research Program, go to [cdmrp.army.mil/prmrpdefault.htm](http://cdmrp.army.mil/prmrpdefault.htm) . The Peer Reviewed Medical Research Program is one of the Congressionally Directed Medical Research Programs directed by Col. Janet R. Harris.

The Peer Reviewed Medical Research Program is an administrative funding agent for the U.S. Army Medical Research and Materiel Command. The command is the Army's medical materiel developer, with lead agency responsibility for medical research, development and acquisition.

The command's expertise in these critical areas helps establish and maintain the capabilities required by the Army to fight and win on the battlefield.

Source: US Department of Defense, by Karen Fleming-Michael

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