

From the University of Mississippi Medical Center Division of Public Affairs

UMMC PARTNERS WITH QUANTALIFE IN \$7 MILLION GRANT TO DEVELOP STAPH BACTERIA DETECTOR

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JACKSON, Miss. – As part of a \$7 million study by California-based QuantaLife, researchers at the University of Mississippi Medical Center will test a machine that promises quicker, cheaper and more efficient testing for the difficult-to-treat, flesh-killing bacteria *Staphylococcus aureus*.

A kickoff meeting between QuantaLife officials and UMMC leadership is planned at the Medical Center for Nov. 8 with an agreement signing and media availability at 2 p.m. in the Arthur C. Guyton Research Library.

The bacteria, methicillin-resistant *Staphylococcus aureus*, or MRSA, causes about 60 percent of all staph infections in hospital patients. While many hospitals screen patients for MRSA, the process is inefficient because detection devices are large, expensive to run and can take 40 minutes to return results.

In that time, MRSA can spread by skin-to-skin contact and infect patients with open wounds. If proven effective, QuantaLife's device could screen all hospital admissions or clinic patients and quickly identify those carrying MRSA but not showing symptoms.

QuantaLife, a two-year-old biotech company, received a \$7 million grant in August from the National Institute of Biological Imaging and Bioengineering. With the funding, it will develop a device for clinical settings based on the technology of its nearly market-ready device for laboratory research settings.

The company subcontracted UMMC's infectious diseases faculty in a five-year, \$1.2 million agreement to compare test results of QuantaLife's prototype devices to those of current industry-standard machinery.

"The goal of the grant is to develop the platform then gather data demonstrating the clinical performance of the device," Ben Hindson, QuantaLife chief scientific officer, said. "We want to get to a point where we can prove our platform is as good as or better than the devices already out there."

With the first two years of grant funding, QuantaLife will develop a smaller machine for clinical and hospital settings based on the technology of its device for laboratory use. Then the company will use the final three years for testing and validation. UMMC will provide testing the entire time.

"We'll essentially take swabs of patients' nasal mucus – the easiest place to find MRSA – and run them through both QuantaLife's machine and the current gold-standard Roche LightCycler machine," said Dr. Skip Nolan, professor of medicine and director of infectious diseases.

The machines, known as Polymerase Chain Reaction or PCRs, replicate nucleic-acid sequences of the sample DNA and look for telltale sequences of the known culprit's DNA.

Dr. Donna Sullivan, professor of medicine and infectious diseases researcher at UMMC, said the first-generation PCR machines took three to four hours to return results.

"The second-generation machines would tell you immediately what DNA you've got and how much. They are more accurate, reliable and quicker, but tests still take 40 minutes and are about \$30 each, which is cost-prohibitive if you want to test every patient admitted to a hospital," she said.

Compared to current machines, QuantaLife's technology uses far less specimen-micro droplets and fractional amounts of testing chemicals. That's how it promises to chop test costs from \$20 to \$2 and from 40 minutes to fewer than 15 minutes, all the while shrinking the machine from office-copier to desktop-printer size.

"People can carry MRSA on their skin and be asymptomatic for months and months," Nolan said. "We know in a hospital gloves and a mask will prevent it from spreading, but you can't put them on everyone. A conventional culture test takes 48-72 hours and current PCR machines still take too long and are too costly."

In the future, QuantaLife's micro-droplet technology PCRs could be tuned for any number of genetic targets.

"Fundamentally, the technology represents a new generation of nucleic-acid testing, so it brings a lot of possibilities to the table," Hindson said. "The core technology is generally very applicable to the next-generation uses. Infectious diseases identification and oncology are two promising areas."

In oncology, Sullivan said the technology eventually could be used to identify genetic markers of certain types of tumors. Quicker and more accurate testing could help physicians target an infectious disease, such as pneumonia, with a specific antibiotic rather than using multiple antibiotics.

The technology offers potential improvements for genetic screening. Maternal blood could theoretically be screened for genetic abnormalities, such as Down syndrome, without having to disturb the fetus, she said.

QuantaLife was founded in 2008 to commercialize technology from Lawrence Livermore National Laboratory. The company's headquarters are in Pleasanton, Calif.

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dentistry and graduate studies, as well as the site where University of Mississippi pharmacy students do their clinical training. The Medical Center's threefold mission is to educate tomorrow's health-care professionals, conduct innovative research to improve human health, and to provide the highest quality care available to the state's citizens. A major goal of the Medical Center is the improvement of the health of Mississippians and the elimination of health disparities. For more information, contact the Division of Public Affairs at 601-984-1100 or visit us on the Web at <http://info.umc.edu/>.