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Teaming Up Against Sepsis

A multidisciplinary team of scientists — including two UC Santa Barbara faculty members — is poised to undertake a major biomedical research initiative focused on the escalating problem of sepsis, the body's abnormal response to severe infections.

Jamey Marth, director of the Center for Nanomedicine (CNM) and also a professor of the Sanford Burnham Prebys Medical Discovery Institute (SBP) in La Jolla, has been awarded a five-year, $12.8 million research grant from the National Institutes of Health (NIH). Increasingly rare, these large awards are structured to fund the best multi-investigator programs using a team approach to solving an important biological and medical problem.

"We were delighted to learn that the NIH reviewed our application as having 'high potential to radically change the way we understand and treat sepsis,'" said Marth, who is also the Carbon Professor of Biochemistry and Molecular Biology and the Mellichamp Professor of Systems Biology. "Millions of people are diagnosed with sepsis each year worldwide, and on average 30 percent die from the complications of sepsis. No new effective treatments have been developed in decades."

Marth's team includes CNM-associated scientists and clinicians from multiple institutes, including UC Santa Barbara, SBP, Santa Barbara Cottage Hospital and UC San Diego.

"I am excited by what this team and unique research program can do," said co-investigator Michael Mahan, a professor in the Department of Molecular, Cellular,

and Developmental Biology, with expertise in infectious disease. “Sepsis is an increasing human health problem, and this award represents a large investment made toward solving it. In fact, to my knowledge, this is the largest NIH research grant ever awarded to a UCSB faculty member.”

Marth added: “This award also indicates that UCSB can effectively compete for scarce NIH biomedical research funds, even without a medical school. The grant leverages the multidisciplinary and synergistic expertise of scientists from multiple institutions and provides access to SBP’s technological and administrative resources.”

Playing a lead role in the translational component is Dr. Jeffrey Fried, an acute care physician at Cottage Health and an expert in the diagnosis and treatment of human sepsis. Fried and Marth have collaborated over the past four years.

“With Dr. Fried’s expertise, we have already made unexpected discoveries pertaining to human sepsis,” Marth said. “This productive, long-term collaboration with Fried was seen by NIH and the review panel as a significant strength of our application.”

“While we have made great strides at Santa Barbara Cottage Hospital in reducing the mortality of sepsis by two-thirds over the past 11 years, we have reached a plateau of what we can accomplish without new treatments,” Fried explained. “Marth and his co-investigators have done seminal work in investigating the molecular basis of sepsis. This work should translate into the development of radically different and more effective approaches to treating sepsis in the future.”

Additional contributing biomedical scientists and clinicians include UCSD faculty member Jeffrey Esko, an expert in the mechanisms of blood-based diseases, and Dr. Dzung Le, head of the clinical hematology and coagulation laboratory at UCSD’s Hillcrest and Thornton hospitals. SBP’s Jeffrey Smith brings leading expertise in mass spectrometry methods applied to blood systems in health and disease to the research effort.

The program will also benefit from the involvement of renowned scientists and clinicians who are members of participating institutions’ advisory boards. “Sepsis remains the leading killer of patients in intensive care units and there are no approved medications,” said advisory board member Dr. Victor Nizet, chief of the Division of Host-Microbe Systems and Therapeutics at UCSD’s School of Medicine.

“The highly innovative discoveries by Jamey Marth and his team have inspired a rethinking of how blood components respond to severe infection and suggest new ways to restore normal function and protect vital organs from injury.”

Marth noted the program’s potential to reduce the frequency of disability and death in patients diagnosed with sepsis. “We have an extraordinary opportunity to achieve major advances in the understanding and treatment of sepsis,” he said.

About UC Santa Barbara

The University of California, Santa Barbara is a leading research institution that also provides a comprehensive liberal arts learning experience. Our academic community of faculty, students, and staff is characterized by a culture of interdisciplinary collaboration that is responsive to the needs of our multicultural and global society. All of this takes place within a living and learning environment like no other, as we draw inspiration from the beauty and resources of our extraordinary location at the edge of the Pacific Ocean.