

UC San Diego Researcher to Lead Fight Against Terrorism on the Medical Front

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A cooperative research project involving seven institutions in the United States and Peru, led by Joseph Vinetz, M.D., professor of medicine in the Division of Infectious Disease at the University of California, San Diego (UCSD) School of Medicine, has received a biodefense grant from the National Institute of Allergy and Infectious Disease (NIAID), part of the National Institutes of Health (NIH). The \$4.7 million grant will enable University of California researchers to fight a disease that is a potential bio-threat to U.S. security.

The grant will be used to study brucellosis, a highly infectious disease with the potential to be exploited as a bioterrorism disease, according to the U.S. Centers for Disease Control. Humans most often become infected by consuming unpasteurized milk products from animals infected with the bacteria that cause brucellosis.

The five-year project is being conducted in collaboration with the Pacific Southwest Regional Center for Excellence for Biodefense and Emerging Infectious Diseases Research at UC-Irvine, directed by Alan Barbour, M.D., and will become part of the University of California's new Global Health Initiative.

"This biodefense research project is an excellent example of the global reach of UC San Diego and the UC System," said UCSD Chancellor Marye Anne Fox. "It will take advanced research techniques developed by UC scientists to countries where the disease is widespread, in order to fight a disease that could impact our national security."

"Brucellosis is difficult to diagnose and treat, and has been explored in the past as a potential bio-warfare agent," Vinetz said. "While the disease is relatively rare in America, cases regularly occur in Texas, Arizona and California, which have a high number of immigrants who consume products made from unpasteurized goat and cow milk."



Joseph Vinetz, M.D.

The \$4.7 million grant is funded by the NIAID/NIH program called "Cooperative Research into Therapeutics and Diagnostics for Category B Bacteria, Viruses, and Parasites." The aim of the research team is twofold: to gather a specimen bank of the bacteria and to develop a novel way to diagnose the disease.

In the current project, brucellosis patients will be identified in the endemic region of Lima, Peru. Brucellosis is common in Peru because many people there commonly consume cheese made from unpasteurized goat milk, according to Vinetz.

Vinetz directs several NIH-funded training and research programs in Lima and in the Amazon region of Iquitos, located in northeastern Peru. There, state-of-the-art laboratory facilities provide an international resource for the study of tropical infectious diseases. These studies are carried out in close collaboration with Peruvian co-investigators and collaborators from the United States, Asia and Europe.

The second aim of the research project is to develop an early diagnostic test for the disease that is inexpensive, easily available and able to be transported to remote sites. Such diagnostics will be developed and tested in the field in Peru, as well as in laboratories at UCSD and UC-Davis. "We hope to develop a low-tech test that is based on high-tech science," Vinetz said. "These tests will be directly useful in the rare event of a bioterrorism attack and, more directly, globally useful in brucellosis-endemic regions."

Additional contributors to the project will include Dr. Renee Tsohis, UC Davis; Professors Eduardo Gotuzzo and Humberto Guerra, Universidad Peruana Cayetano Heredia, Lima, Peru; Professor Robert Gilman, Johns Hopkins University; Dr. Eric Hall, U.S. Naval Medical Center Research Detachment; and Dr. Manuela Verastegui, Asociacion Benefica PRISMA, Lima, Peru.

About Brucellosis

Brucellosis is an infectious disease caused by the bacteria of the genus *Brucella*. These bacteria are primarily passed among animals, and they cause disease in many different vertebrates, including humans who often become infected by coming in contact with animals or animal products that are contaminated with these bacteria.

The most common way to be infected is by eating or drinking contaminated milk products. When sheep, goats, cows or camels are infected, their milk is contaminated with the bacteria; if the milk isn't pasteurized, these bacteria can be transmitted to persons who drink the milk or eat cheeses made of it, sometimes called "village cheeses."

While direct person-to-person spread of brucellosis is extremely rare, there exists the potential threat that a highly infectious form of the disease could be developed in an aerosolized form. In humans, brucellosis can cause a range of symptoms that are similar to the flu and may include fever, sweats, headaches, back pains, and physical weakness. Severe infections could result in

damage to the central nervous system or lining of the heart, or in chronic symptoms that include recurrent fevers, joint pain, and fatigue.

The agents of brucellosis, called *Brucella spp.*, have been classified as Category B pathogens because these bacteria are stable in the environment, are easily aerosolized, highly infectious, difficult to treat, and result in prolonged debilitating illness.

There is currently no vaccine available for humans.

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