

**NON-TECHNICAL ABSTRACT:** (State in layman's terms the application's broad, long-term objectives and specific aims, making reference to the potential public benefits of the project for California.)

*Staphylococcus aureus* is a naturally occurring bacterium that resides in approximately one-third of the human population and causes a wide variety of diseases ranging from superficial skin infections to life threatening bloodstream and tissue infections. *S. aureus* has developed resistance to multiple antibiotics and methicillin-resistant *S. aureus* (MRSA) strains, which are wide spread in both hospital and community settings, are now the number one cause of death in the United States. *S. aureus* is an important cause of mastitis in dairy cattle, resulting in annual economic losses totaling millions of dollars world-wide. Currently there is no available vaccine for the preventative treatment for MRSA, thus there is an urgent need to develop novel and better vaccines to combat this infection. The overall objective of this proposal is the development a vaccine/immunotherapy against MRSA that would reduce disease incidence in human patients as well as help eradicate and control disease dissemination in dairy cattle, a leading industry in California. We have partnered with a company, Prommune Inc., to design and test new vaccine candidates using a novel adjuvant. This adjuvant, designated EP67, acts to stimulate the immune system to respond more vigorously to the vaccine, thus providing increased immunity to MRSA disease. Vaccine candidates will be tested in several mouse models that mimic the natural route of human infection. We will also examine the possibility that EP67 by itself will stimulate immune cells that will sufficiently control MRSA infection. It is anticipated that the results obtained from this research project will lead to the development of a vaccine and/or treatment of MRSA disease in humans and animals, which will have a significant health and economic benefit for California.