

EXECUTIVE SUMMARY [NON-CONFIDENTIAL, NON-TECHNICAL ABSTRACT FOR PUBLIC INFORMATION OR PROGRAM PROMOTION]: 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 relevant to California. Do not include proprietary or confidential information. This may be distributed before the funding decision has been finalized.

Recent global events have made the production of safe, effective vaccines vital to our future. With emerging infectious diseases, bioterrorism and antibiotic resistance on the rise, we need vaccines to protect our troops, our children and ourselves from infectious disease. Vaccines are difficult to engineer, however. They must be safe while inducing strong immune responses that can protect from infection through natural exposure. The ability to formulate a vaccine that stimulates good immunity without risk of infection is the major goal of the industry. Mucosal delivery, by generating a pill or a nasal spray, is also very important because many bacteria and viruses infect a-cross mucosal membranes. We are working with a company called Vaxiion, Inc. to find out if bacterial minicells can be used as a vaccine delivery system. Bacterial minicells are small bacterial cells that do not contain any genes of their own, and therefore, they can not cause infection. However, they can be engineered to contain antigenic proteins from microorganisms that can stimulate immunity. In addition to the delivery of antigenic protein, the minicells can deliver plasmid DNA that encodes the protein desired. When delivered to a person, this DNA can induce strong immune responses. Because the minicells come from a strain of bacteria that is found in all humans, they themselves represent little risk. If these studies demonstrate that minicells can be used to induce a protective immune response, a brand new delivery mechanism will be available for the use in new vaccines.