

**EXECUTIVE SUMMARY [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. Legionnaire's disease is a pneumonia-like illness that results from the inhalation of a bacterium called *Legionella pneumophila*. *L. pneumophila* lives in its natural host, the amoeba, in a variety of fresh water sources including the water in air conditioners and cooling towers. Infection occurs when aerosolized water droplets from contaminated water sources are inhaled into the lungs where bacteria are internalized by host immune cells. In susceptible individuals, bacteria grow and multiply inside host cells instead of being killed.

Bacterial intracellular survival is dependent on the ability of *L. pneumophila* to inject bacterial proteins, called effector proteins, into the host cell cytoplasm. Although more than thirty effector proteins have been identified, the functions of very few of these have been elucidated. Bacterial mutants in which expression of a single bacterial effector protein has been disrupted, generally show no defect in intracellular growth. This may be due to both the redundancy of proteins that the bacterium expresses (more than one protein may be capable of performing the same function) and, because proteins often function in complex with other proteins (creating macromolecular assemblies). This project will utilize a technique called yeast 2-hybrid analyses to identify *L. pneumophila* effector protein complexes that aid the bacterium in establishing an intracellular residence. In addition, this grant will give CSUN students the opportunity to learn and apply cell and molecular biology techniques to identify potential therapeutic targets for further investigation.