

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.

Our physical senses are constantly stimulated by the environment. Each cell in our body translates these sensations in a manner that we are able to interpret their meanings. Distinct sensory information is processed by proteins known as the transient receptor potential (TRP) ion channels. One very interesting TRP channel member, named Mucolipin-1, is proposed to be involved in transporting various proteins inside the cell that are destined for either recycling, or for destruction. Mutations that disable Mucolipin-1's normal channel activity cause the disease known as Mucopolysaccharidosis IV (ML4). This channel is present in major organs and tissues (brain, eye, heart, lung, liver, stomach, muscle). Therefore, ML4 sufferers typically have problems related to digestion, seeing, thinking and movement. Because of their very importance, channels like Mucolipin-1 are strictly regulated by cells through the help of specific protein binding partners. With this in mind, we then ask the question: what proteins bind and influence the channel's distribution, recycling, destruction, or activity in cells? We will tackle this uncertainty using molecular and cellular biology techniques. Data obtained from this study will help us further understand the biological and physiological significance of Mucolipin-1 and its binding partners in humans. By virtue of their influential role on channel function, binding partners that could be identified in this study are potential drug targets that could help people suffering from ML4 and other related diseases.