

**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.

Brain cell cancers called glioblastoma are one of the most deadly cancers in humans. These cancers do not respond to normal treatment options for patients including surgery, chemotherapy, and radiation. We have turned to viral therapy (a form of gene therapy) as a way to target the cancer. By introducing a virus into the cancer cells, we have tricked them into taking up a special gene that activates monocytes and macrophages (which are made by monocytes) to kill the cancer cell. It is called a stimulating factor. Monocytes/ macrophages are special cells that destroy bad cells like cancer cells. We are using a virus to target cancer cells and only cancer cells, since normal cells do not take up the virus. This therapy has worked in rats. Rats that have the glioma cancer survive this viral treatment and are cancer free. Rats that did not get the treatment all died. In order to test this therapy in humans, we have to know the mechanism by which the cancer cells die. We discovered that certain genes are turned on that activate ion channels. Ion channels are pores in the membrane of cells that allow ions to pass through. Ion channels regulate everything from blood pressure to the firing of neurons. Our goal is to study how these channels facilitate the killing of the cancer cells through the action of the virus. If we can understand the mechanism, we can test this therapy in people. The potential benefit is saving thousands of lives in California and around the world.