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.

The large-scale study of protein structure and function, proteomics, has become an instrumental way to discover biomarkers of stress and disease. We will use this methodology to achieve our long term objective of examining how ultraviolet radiation (UVR, 290-400 nm) affects marine organisms and cell cycle regulation. Stratospheric ozone depletion has lead to increases in UVR on Earth, so it is increasingly important to understand how UVR affect all organisms. UVR causes both indirect and direct damage to DNA, proteins and lipids. UVR causes disruptions in cell division of most cells and causes abnormalities in development and decreased survivorship among marine organisms, including sea urchin embryos, which are released and float freely in the ocean. Sea urchins are an ideal model system for studying cell mechanisms in general because they are easy to culture and observe in the laboratory. Our previous results show that UVR alters proteins that control cell cycle in sea urchin embryos. We will build on these studies and examine a broader range of effects of UVR on sea urchin proteins. Our specific aims for this study are to utilize two state-of the art technologies, two dimensional gel electrophoresis and mass spectroscopy to investigate how protein translation (production) and post-translational modification (activation) is affected by UVR in sea urchin embryos. These studies will give us a better understanding of how protein expression and activity are affected by UVR and may allow us to develop biomarkers of UV-induced stress that we can apply to many organisms to examine whether they are able to adapt to increased UVR due to ozone depletion.