

**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.

Monitoring gene expression is currently an important avenue of research in biotechnology, in order to assess the levels and function of an mRNA transcript and its corresponding protein in cells and tissues. The resulting genes that are turned on in various cell types are often indicators or predictors of disease, therefore, understanding the molecular and cellular basis for these levels of expression may have a fundamental impact in various areas of biochemistry and biomedicine. Because of the biochemical pathway that originates with a DNA sequence, produces an intermediate mRNA transcript, and results in translation of a protein product, there are several points at which gene expression can be monitored. In order to gain a more accurate understanding of this process at the molecular and cellular levels, our objective is to study lactate dehydrogenase (LDH) as a model gene, by measuring *both* the mRNA transcript and the protein product, in single mammalian cells. The specific objectives include: **(1)** Optimizing an approach for detection of the mRNA; **(2)** Developing a strategy to quantitate the LDH protein; and **(3)** Combining the two approaches to achieve a simultaneous analysis.