

NON -TECHNICAL ABSTRACT: *(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 for California.)*

It has been known since 1969 that adenosine-5'-triphosphate (ATP), a molecule important in biological energy transfer and cell signaling, is released from exercising muscle into the blood. Surprisingly, few studies had examined the effect of extracellular ATP on mature mammalian skeletal muscle until recently.

This gap in the literature was addressed by a recent publication of the PI. It was found that that extracellular ATP dramatically enhances electrical signaling and hence, muscle excitability by inhibiting pathways for the movement of chloride (one component of salt) across muscle membranes. That unexpected discovery has important implications for muscle fatigue and inherited diseases that affect skeletal muscle function. The aim of this research proposal is to initiate a research program involving undergraduate and graduate students that determines the precise signaling mechanism mediating the effects of ATP and determines how that mechanism influences active mammalian muscle. This research will identify potential therapeutic targets for treating disorders of skeletal muscle.