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.

Lyngbyatoxin A is an environmental toxin that causes "Swimmer's Itch" and is produced by a Hawaiian strain of cyanobacteria. It belongs to a group of compounds that have attracted substantial biological interest due to their ability to selectively interact with protein kinase C (PKC), a component of diverse signaling pathways in biological systems. Compounds that interact with different variants of PKC represent important leads in cancer chemotherapy, diabetes, and treatment of neuropathic pain. It was recently found that one of the enzymes involved in the natural production of lyngbyatoxin A, LtxC, is a novel aromatic prenyltransferase that is capable of producing carbon-carbon bonds in a manner that is difficult to achieve by chemical means. The specific aims of this work include improving the purification of LtxC and carrying out further characterization of this enzyme catalyzed reaction with chemical and biochemical techniques. The information gathered from this study will form the basis to generate engineered forms of the enzyme that will have increased capacity to generate potential pharmaceutical agents.