

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.

Over 300 million cases of malaria are reported worldwide each year with a major impact on African children under the age of 5. A key target for malarial therapeutics is the cyclin-dependent kinases (CDKs) of the malarial parasite, *Plasmodia falciparum*. CDKs are found in all non-bacterial species as part of the basic machinery required for cell multiplication. Comparison of the sequence and activity of the three malarial CDKs found to date to those from humans has suggested important functional differences between the CDKs of the distantly related human and plasmodial species. If these differences in function are carefully characterized, this information can be used to aid the development of drugs that are specific for plasmodial CDKs. The result would be therapeutics that could halt malarial multiplication without harm to the human host. Of the three malarial CDKs identified to date, PfPK6 is the malarial CDK most different from its human relatives. To begin study of PfPK6, we will produce and purify recombinant PfPK6 enzyme from *E.coli* and study its catalytic activity *in vitro*. These data can then be compared with those previously determined for an extensively studied human CDK, CDK2/cyclin A, to provide mechanistic detail into the differences between the enzymes that govern cell multiplication in host and parasite. The objective of this research is to perform a detailed study of PfPK6 catalytic function and establish a program in malarial CDK research in my laboratory. The studies of malarial CDKs will be performed as one part of a global collaboration currently using a variety of approaches to understand the role of *P. falciparum* CDKs in disease and develop CDK-targeted anti-malarial therapeutics. This study will give Cal Poly undergraduates experience in biochemical techniques such as recombinant DNA technology, protein purification, and spectroscopic enzyme assays.