

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.)

Despite the discovery of antibiotics, microbial diseases have not been eliminated but rather have been on the upswing around the world. These diseases remain the number 1 cause of death worldwide and the third leading cause of death in the United States. Virulence factors are microbial products that contribute to microbial pathogenesis by functioning as toxins, adhesins, or protease that degrade host proteins. SPATEs are multifunctional virulence-associated proteins that have increasingly gained attention due to their involvement in numerous enteric diseases that are caused by *E. coli*, *Salmonella* and *Shigella*. Our study aims to determine the structural determinants of a SPATE protein, the Tsh hemagglutinin of pathogenic *E. coli*, which could provide key information to facilitate the design of novel approaches to block Tsh activity and *E. coli* pathogenicity.

The potential benefits of this research project are far-reaching. Graduate students at Cal Poly Pomona who are majoring in Biology with emphasis in Biotechnology or Microbiology will have the opportunity to perform original research in the field of infectious diseases. Given that most of our graduates are employed by the local biotechnology and pharmaceutical industry in Southern California and the Bay area, this research project will provide an excellent training opportunity for future researchers who will be employed in the State of California.