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Abstract

“Designing a β–stranded antibiotic efflux inhibitor”

Antibiotic resistance presents an increasingly critical global health crisis for modern medicine. Bacterial antibiotic resistance is largely a function of the ability of the bacterium to transport antibiotics outside the cells by means of efflux pumps. The acridine efflux pump is the preeminent efflux pump in E. coli and is responsible for shuttling out most classes of antibiotics. A beta barrel composed of three proteins constitutes the outer membrane component of this efflux pump. We demonstrate that the oligomerization of the outer membrane beta barrel can be disrupted through a beta-stranded ligand. The expression of this ligand abrogates efflux, and makes E. coli more susceptible to antibiotics.

Bio-Summary

Dr. Pinakin Sukthankar received his bachelors in chemistry and his masters in organic chemistry from the University of Bombay where he concentrated on the development of pathways for the stereospecific synthesis of industrially relevant indole alkaloids. He then earned his Ph.D. at Kansas State University, under the mentorship of Prof. John Tomich, where he worked on the engineering and synthesis of membrane peptide sequences for biomedical applications. Dr. Sukthankar is currently a postdoctoral researcher with Prof. Joanna Slusky at the University of Kansas where his research is primarily focused on the biophysical characterization of the assembly and folding of polymeric beta barrel proteins in the bacterial outer membrane.