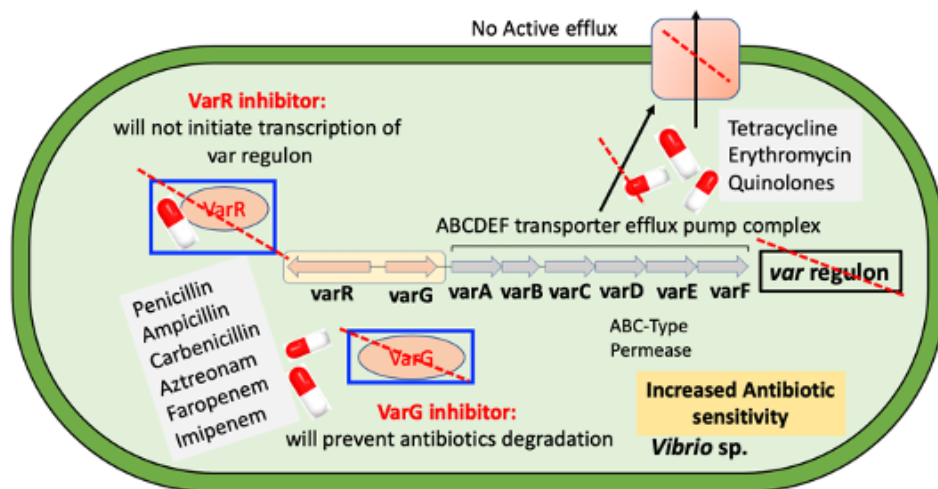


# Combating Antimicrobial Resistance (AMR) in *Vibrio* sp. by targeting vibrio antibiotic resistance (*var*) regulon: Structural and biochemical characterization of *var* regulon activator (VarR) and metallo- $\beta$ -lactamase (VarG) in *V. cholerae* and *V. vulnificus*

## Graphical Abstract/ Layout



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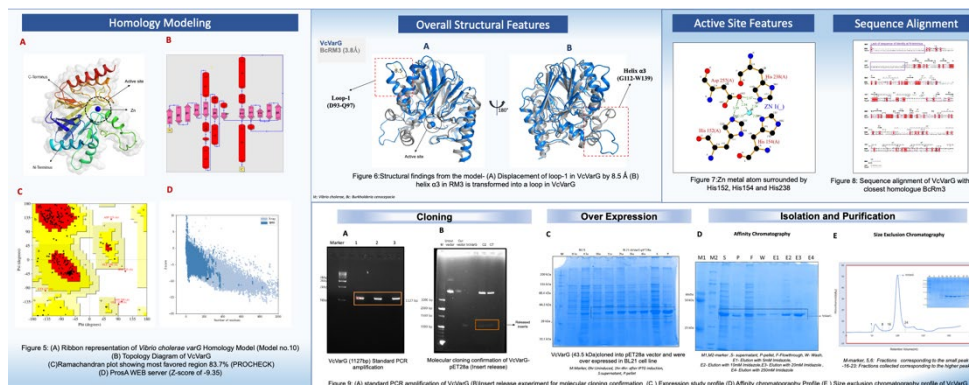


### Project Description: (Restricted to 150 words):

One of the growing concerns for global public health is antimicrobial resistance (AMR). Multi-drug-resistant bacteria have been documented to cause more than 700,000 fatalities annually and AMR is predicted to cause more than ten million deaths yearly by 2050, overtaking cancer as the main cause of death worldwide

A wide range of  $\beta$ -lactam medications, including carbapenems, are being hydrolyzed by various antibiotic resistant mechanisms in *Vibrio* sp. Therefore, it is crucial to understand the mechanisms underlying antibiotic resistance in *Vibrio* sp., to create strategies to overcome AMR, prevent the spread of resistance genes to other pathogenic bacteria, and successfully stop cholera-like epidemics. A recent report from Lin et al., identified a putative antibiotic resistance regulon (*var*), that contain transcription regulator, VarR, transcribed close to antibiotic resistance genes, metallo- $\beta$ -lactamase (VarG) and an antibiotic efflux pump (VarABCDEF) in *Vibrio Cholerae*. We hypothesize that the structural and biochemical characterization of two important targets: the transcription regulator VarR and metallo- $\beta$ -lactamase, VarG, are pre-requisite to understand the molecular mechanism of antibiotics recognition and resistance due to *var* regulon specific to *Vibrio* sp. Structure-based inhibitor development might increase the antibiotic sensitivity in *Vibrio* sp

### Products/ Instruments/ Results/ Outreach Activities (Pictures)



**Name of the Funding Agency**  
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Science and Engineering Research  
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**Name of the Scheme**  
State University Research Excellence  
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**Sanctioned Amount (in Rupees)**  
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**Duration of the Project (years)**  
3