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**Major Research Area:**

1. Specialized secretion systems are versatile transporters in nature and widespread in the prokaryotes. Bacterial pathogen utilizes these secretion systems for virulence and survival in the host cell. *Helicobacter pylori* which is found in half of the World’s population, encodes a 40kb *cag*-pathogenicity island (*cag*-PAI) that constitute an active type IV secretion system (T4SS). Cag-T4SS is membranes spanning protein complexes having surface exposed pilus that transports ‘Oncoprotein’ CagA into the host cell and associated to morphological changes and gastric adenocarcinoma. This T4SS is constituted by 27 Cag proteins, among them most of the Cag proteins are unique and little is known about their role in the biogenesis of T4SS. Our lab is trying to understand the constitution of Cag- T4SS and mechanism of translocation of CagA across the bacterial membranes. Moreover, to unravel the survival strategies of *Helicobacter pylori* in human stomach.
2. Exploring therapeutic use of natural compound against gastric infectious disease and antibiotic resistance gut pathogen *Helicobacter pylori*. The WHO mentioned *Helicobacter pylori* among 16 antibiotic-resistant bacteria that is one of the greatest threat to human health. Several natural compound are traditionally being used for the treatment of H. pylori infection. Therefore, our lab is trying to explore different medicinal plants to design new and effective natural drugs or in combination with antibiotics against H. pylori infection.