



CANCER PREVENTION & RESEARCH INSTITUTE OF TEXAS

Award ID:
RP170805

Project Title:
Etiology and Prevention of Gastric Cancers by Mitigation of H pylori
Mechanosensing

Award Mechanism:
High Impact/High Risk

Principal Investigator:
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Entity:
Texas A&M Engineering Experiment Station

Lay Summary:

Gastric cancer is the second-leading cause of cancer-related deaths in the world. It is estimated that around thousand Texans continue to die from this type of cancer each year, with unacceptably low 5-year survival rates. *Helicobacter pylori*, a gram-negative bacterium and a class 1 carcinogen, is the primary cause of gastric cancer especially in the lower part of the stomach. About 60% of the world population harbors these bacteria and people with long-term infection have a predisposition towards chronic atrophic gastritis, pre-cancerous modifications in the inner lining as well as certain types of lymphoma of the stomach. Significantly, once these bugs colonize the stomach the host immune system is ineffective in getting rid of them and colonies can persist lifelong, unless treated. How the bacterium detects adhesion to gastric substrates and initiates the expression of pathogenic genes responsible for carcinogenicity are outstanding questions that prevent the development of advanced therapeutics to prevent gastric cancer. In this application, we propose to determine how *H. pylori* sense adhesion to epithelial substrates within the stomach. Next, we will determine whether sensing triggers the release of virulence factors that increase the risk of cancers. Finally, we will quantitatively determine the effectiveness of a commonly-employed drug in the disruption of substrate-sensing mechanisms. It is our anticipation that the results will provide us with a launching pad in the future for the development of therapeutic strategies that will interfere with substrate-sensing and minimize *H. pylori*-carcinogenicity.