

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.)* In the past decade, a new technology with therapeutic potential was developed known as RNA interference (RNAi) and has been widely heralded as a major scientific breakthrough. However, like many technologies, implementation into useful therapies has proven extremely difficult, with the primary problem being of how to get the therapeutic molecules exactly where they are needed within the body. This proposal is designed to explore the use of probiotic microbes (good bacteria) containing a naturally occurring nano-scale genetic component known as filamentous phage as a delivery mechanism for RNAi. Filamentous phage spontaneously released by the bacteria can then target the cells associated with human disease. By engineering them to deliver RNAi to these cells, they would have the ability to interfere with disease-causing genes, thereby treating the disease. The long-term objectives of the study include enhancing ways to overcome the delivery challenges faced by RNAi and to investigate the use of naturally occurring delivery mechanisms as therapeutics. These studies have the potential to lead to external funding for California State University, Northridge that would result in the training of undergraduate and graduate students and improve the development of safe and effective treatments for a wide range of diseases, including chronic inflammatory bowel disease, familial polyposis and cancer.