Market Opportunity:
Sjögren’s syndrome (SjS) is an age-related chronic inflammatory disease that affects up to 4 million people in the United States. These patients suffer from dry eye disease caused by lacrimal gland inflammation. Intercellular adhesion molecule-1 (ICAM-1) is a potential therapeutic target for SjS, because it is upregulated in inflamed lacrimal gland tissue. However, treatments targeting ICAM-1 are not in the market yet. Due to a growth in the aging population, the market for SjS treatments is set to reach $2.2 billion by 2024, and novel treatment approaches will become extremely valuable.

USC Solution:
USC scientists have genetically engineered elastin-like polypeptide (ELP) nanoparticles to bind ICAM-1 receptors. These nanoparticles can carry protease inhibitors and other small molecule drugs specifically to inflamed lacrimal tissue, where ICAM-1 receptors are over-expressed. Since antigen-bound ICAM-1 receptors are internalized by the cell, this system provides an efficient method for targeting drugs to the interior of cells.

Value Proposition
• Novel protein-based targeted drug delivery strategy
• Potential application to treat other autoimmune diseases
• Uses biocompatible, biodegradable and less immunogenic ELP-1 polymers
• Selectively targets disease tissue

Keywords:
Autoimmune, inflammation, nanomedicine, therapeutics, elastin-like polypeptide, targeted delivery, lacrimal gland, eye diseases, Sjögren’s syndrome, rheumatoid arthritis, systemic lupus erythematos