



# Dr. Elizabeth Vargis

## Nanoscale Engineering

We use nanoscale engineering to understand and solve complex problems. Nanoscale engineering combines a variety of techniques from multiple research areas, like biology, chemistry, and electrical engineering and manufacturing. We use methods such as soft photolithography, nanoparticle synthesis, cell growth and micropatterning. Some of these techniques are being used by our research group to manipulate retinal pigment epithelial cells to understand how vision diseases occur and how they can be prevented.

We are also trying to simulate microgravity to address debilitating cases of muscular atrophy, here on Earth and in spaceflight. Another major component of our research relies on surface-enhanced Raman spectroscopy to detect small concentrations of both bacteria and biomarkers of disease. The success of these projects will lead to methods of identifying harmful bacteria in real time and diagnosing specific cancer types at earlier stages. By employing a multifaceted approach, we will build better systems to identify and elucidate biological problems.

