“Developing novel bioconjugates for the detection and treatment of bladder disease”

PI: John Muschler, Ph.D, Research Associate Professor, Biomedical Engineering
Contributors: Theresa Koppie, M.D., Associate Professor, Department of Urology

Diseases of the bladder are prevalent and formidable clinical problems. Bladder cancers are diagnosed in approximately 70,000 people each year in the U.S., and interstitial cystitis (painful bladder syndrome) effects between 4 and 12 million people in the U.S.. Currently, the methods for detection, surveillance, and treatment of these common bladder diseases are costly and ineffective, and present a very large opportunity for improvements in patient diagnosis and treatment.

We are creating novel affinity-based targeting agents (bioconjugates) that are designed to be selectively absorbed by diseased cells of the bladder where normal tissue structure is disrupted. These bioconjugates will have applications for imaging of diseased cells in the bladder, and also for targeted drug delivery. Multiple products can be developed through this platform technology, including imaging agents for early detection, diagnostic agents for disease stratification, fluorescent bioconjugates for guided surgery, and targeted therapeutics. Our initial focus is on the disease of bladder cancer, with applications for interstitial cystitis and other diseases to be pursued subsequently. Our immediate goal is the validation of our bioconjugates for both imaging and treatment of bladder disease using a preclinical animal model of bladder cancer. The long-term goal of this work is to commercialize novel affinity-based targeting agents for the more effective detection and treatment of multiple human diseases. Data to be obtained through OCTRI funding will provide proof of principle for the utility of our bioconjugates, and set the stage for Fast-Track STTR funding and/or industry partnership, leading to clinical testing and commercialization.