

When you eat fast food, what do you keep track of? Calories? Carbs? Fats? What about phosphate? Ten percent of the world population is affected by a certain disease that takes the lives of millions of people every year. This disease is Chronic Kidney Disease or CKD. Healthy kidneys help remove waste products from the body, and CKD is defined by a gradual loss of kidney function over time, as a result, mineral metabolism suffers and patients experience elevations in a variety of metabolites. Knowing the concentration of these molecules is extremely important for guiding effective treatment for CKD patients, and this year our team wants to revolutionize the landscape of CKD Diagnostics. The gold standard for monitoring kidney function involves sampling and testing the blood. The problem is that blood is collected only once every six weeks, making a lot of this data very difficult to use and interpret as many electrolytes and hormones fluctuate daily. This leaves much to be desired for effective CKD monitoring. Our goal is to transform the way CKD is monitored. We will create a fast and selective CKD diagnostic tool to allow frequent monitoring - something lacking in the clinic. We will do this by engineering a fluorescent biosensor protein. Combining the technologies of fluorescence with protein immobilization in a novel, modular way to allow accurate and cost-effective detection of critical metabolites. We are team Queens_Canada competing at iGEM, a competition in synthetic biology. We are a diverse team of biochemists, engineers, scientists, and doctors, and our goal is to revolutionize the realm of CKD Diagnostics.