**Abstract**

This project addresses one of the 14 grand challenges for Engineering (articulated by National Academy of Engineering) in the category of Engineering Better Medicine - "What is engineering’s role in creating personalized medicine?"

A team of 11 undergraduate students is developing a platform and methodology to rapidly identify pathogens with a low cost, user-friendly and highly sensitive biosensor. The cost-effective and user-friendly features of this sensor platform will lead to significant progress towards the future of demanded personalized medicine. In the future, the team will determine multiple antibiotic drug efficacies.

**Objectives**

- Build and test biosensor
- Establish the biological processes for pathogen detection
- Develop the detection software for smartphone-based platform

**Design Components**

- Pathogen Biosensor - to identify pathogens and their concentrations
- Holder Platform - provides durable platform when recording data
- Smartphone - captures biosensor data and provides pathogen information
- Drug Testing Assay - for drug efficacy testing

**Conclusion & Discussion**

- Fabrication of sensor is complete.
- Biological process for identifying pathogen has been identified and is being tested.
- Detection software and algorithm has been implemented in computer and will be applied to smartphone.
- Graphical User Interface (GUI) is already being developed for Android smartphone.

**Acknowledgments**

- Dr. Jun Kameoka and Dr. Kung-Hui Chu for co-advising this project
- Jaskirat Batra for being graduate mentor for this project
- Magdalini Lagoudas and the Aggie Challenge program for providing funding for this project