

GPCR-Based Biosensors for Medium-Chain Fatty Acids (#6767)

Biosensor to increase production of microbes for biofuel production

Georgia Tech inventors have engineered two G-protein coupled receptors (GPCR) biosensors for the detection of medium-chain fatty acids, which are immediate precursors to diesel. The biosensors show an 8-10 fold increase in signal after activation in the presence of fatty acids. By introducing an orthogonal response unit, the signal substantially improved to 12-fold. The GCPRs have an affinity for a wide range of chemicals, which means new biosensors can be rapidly assembled by simply swapping the GPCR sensory unit.

Benefits/Advantages

- **Innovative** – first medium-chain fatty acid biosensor
- **Cost Saving** – enables more rapid production
- **Diverse applications** – applications that require different dynamic and linear ranges

Potential Commercial Applications

- Healthcare - microbe-based bio-pharmaceuticals
- Energy production
- Agriculture
- Chemical Production - smart cells to detect chemicals in the environment

Background/Context for This Invention

The microbial production of chemicals can provide a sustainable, cost-effective, and green alternative to the synthesis of fuels and chemicals from petroleum. However, screening chemical-producing microbes remains one of the most time consuming steps in metabolic engineering due to a reliance on low-throughput technologies. Most value-added chemicals are not colorimetric, and necessitate sensors for screening to reach higher rates of production.

Dr. Pamela Peralta-Yahya

Assistant Professor - Georgia Tech School of Chemistry and Biochemistry

Publications

[*GPCR-Based Chemical Biosensors for Medium-Chain Fatty Acids*](#), ACS Synthetic Biology, May 20, 2015

For more information about this technology, please visit:

<https://licensing.research.gatech.edu/technology/gpcr-based-biosensors-medium-chain-fatty-acids>