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Constructing a Biological Breathalyzer

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Constructing a Biological Breathalyzer

The goal of this research is the manipulation of yeast cells; granting them the capability of measuring the concentration of ethanol present. This project utilizes the metabolic pathways of the yeast *Pichia pastoris*, which are capable of metabolizing ethanol and methanol. The enzyme, alcohol oxidase (AO), encoded in the AOX gene appears to be the major enzyme involved in methanol metabolism. If both carbon sources are present, however, *P. pastoris* prefers to utilize ethanol first. Fusing the AOX promoter with a fluorescent protein gene will allow visible detection of the expression of AOX. In supplying the yeast with ethanol and methanol simultaneously, the cells should produce the fluorescent protein upon ethanol consumption; resulting in a visible color and fluorescent light. The concentration of ethanol can be determined by measuring the time before fluorescence and in doing so, will make plausible the development of a breathalyzer device and additional sensor systems.

Cory is a senior majoring in biological sciences and chemistry at Missouri S&T. He is actively involved in various organizations to include: Helix, Scrubs, Phi Sigma, and V.O.I. Presently, his interests are reading, participating in research projects and socializing with friends. Cory's future plans after undergraduate school is to attend medical school.