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Biological Breathalyzer

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Joint Project with Jacqueline Schneider

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Biological Breathalyzer

The aim of this research is the construction of a biological breathalyzer through synthetic biology. The metabolic pathways of a species of the *Pichia* taxa are used. The yeast is able to metabolize both ethanol and methanol. The first known by-product of methanol metabolism is the AO enzyme from the AOX gene. When both ethanol and methanol are present, the yeast prefers to metabolize ethanol so the AOX gene is not expressed. The AOX gene promoter is fused with a fluorescence protein gene so expression of the AOX gene can be visually detected. When the cell is supplied with both ethanol and methanol, the amount of time before fluorescence will correspond to the amount of ethanol given to the cell. In this way, the concentration of ethanol can be determined.

Brian Pink is a junior pursuing a B.S. in BioChemical Engineering and a minor in Biology at Missouri University of Science and Technology. Brian is from Kansas City, Missouri where he graduated from Rockhurst High School. Brian is also a member of Phi Eta Sigma (freshman honor society), AIChE, Phi Sigma (Biological honor society), Omega Chi Epsilon (Chemical engineering honor society), Missouri S&T's iGEM team (International Genetically Engineered Machines Competition), and works in the cDNA neurobiology lab at Missouri S&T.