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The Use of Reactive Oxygen Sensitive Green Fluorescent Protein to Determine Reactive Oxygen Species Production in *E. coli* and *Candida albicans*

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Candida albicans is an opportunistic fungal pathogen commonly found in the mucosal tissue of the human body. In immune-compromised patients, *C. albicans* causes candidiasis, which can be fatal when the yeast causes systemic fungal infections. It is currently treated with broad-spectrum antifungals, but antifungal resistant strains are emerging. Reactive oxygen species (ROS) are produced as a stress response by the cell to antifungal drugs, making it possible to test the effectiveness of drug therapies. A reactive oxygen sensitive yeast enhanced GFP (royGFP), with mutations at S147 and Q204 where the amino acids are replaced with cysteine (S147C and Q204C), make it possible to measure the production of ROS by the change in fluorescent excitation. In the presence of ROS agents we have observed changes in excitation confirming the functionality of our royGFP construct. In testing in *E. coli* we found high levels of expression of the yeast codon optimized royGFP, which lead to its inclusion in the project. We are currently working to optimize the ROS experiments in *C. albicans* and further develop ROS experiments in *E. coli*.