ABSTRACT

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Title:	Creation Of A Synthetic Biological Biosensor For Detecting Tuberculosis
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Tuberculosis is a bacterial infection that almost exclusively affects underdeveloped regions due to the expensive and non-transportable nature of current diagnostics. I have joined a project designed to create a new, point-of-care based, diagnostic biosensor for detecting tuberculosis that will be better suited for use in regions of high incidence. The diagnostic biosensor's design is based on the functionality of a synthetic gene pathway in a recombinant organism. I will begin the cloning procedures, necessary to prepare the genes for combination into the final synthetic pathway, via 3A assembly, using traditional and iGEM cloning methods. For my research, I used plasmids, provided in the 2016 iGEM DNA Distribution kit, and mainly traditional cloning methods with transformation as a medium for vector amplification and assessing the success of cloning ligation reactions. The transformations were preformed using chemically competent JM109 *E. coli* cells from Zymo research's Mix & Go kit. Successful transformations were determined based on the appearance of red colonies on plates containing antibiotics matching the resistance markers of the vector being used. Successful cloning was to be determined through comparing resulting band size, of digested ligation products following gel electrophoresis, with the expected size based on correct cloning. I was able to create and quantify amplified plasmid stocks for each of the plasmids that will be used to assemble the device via 3A assembly. I also cloned the insert, sfGFP_TT, into a sample of 1.50 ug/ul concentrated pSB1C3, via traditional cloning methods, which can be used, in further experiments, to test the synthetic pathway for functionality as it is being constructed.