BIOGRAPHICAL SKETCH

Morgan Leigh Bocci was born on February 7, 1992 in Eugene, Oregon, but moved to Columbia, Tennessee before starting school. She graduated seventh in her class from Columbia Central High School in 2010. In 2015 Morgan obtained her Bachelor of Science in Chemical Engineering with an emphasis in Biomolecular Engineering from Tennessee Technological University, graduating Cum Laude. As an undergraduate, Morgan worked in protein engineering under Dr. Jeffrey Rice on a project that sparked her interest for research in graduate school.

In August 2015, Morgan entered the Master's program at Tennessee Technological University and obtained a Master of Science in Chemical Engineering in May of 2017.

EDUCATION

M.S. Chemical Engineering
Tennessee Technological University, 2015-2017

B.S. Chemical Engineering, Biomolecular Concentration
Tennessee Technological University, 2010-2015

College of Engineering

TENNESSEE TECH

The Department of

Chemical Engineering

Announces the Thesis Defense

Of

Morgan L. Bocci

In Partial Fulfillment of the Requirements

For the degree of

Master of Science

April 5, 2017
1:30pm

Held at

1020 Stadium Drive | Prescott Hall 225
Cookeville, TN 38505

FIELD OF STUDY

Chemical Engineering

THESIS TOPIC

The Development of Protein Display Technologies for Green Fluorescent Proteins

EXAMINING COMMITTEE

Dr. Robby Sanders (Chairperson)

Dr. Pedro Arce

Dr. Xuanzhi Zhan

ABSTRACT

Fluorescent proteins (FPs) play an important role in the ability of researchers to track cell expressions throughout biological processes without hindering the function of the cells. They contain a fluorophore housed in a β-barrel structure that when excited by light at particular wavelengths absorbs the light energy and emits a signal at a higher wavelength in the visible spectrum allowing the FPs to be seen in real time. Great strides have been made in the evolution of fluorescent proteins and specific to this progression is the super-folder green fluorescent protein (sfGFP). sfGFP is one of the most robust variants emitting light energy in the green color spectrum, but like many FPs, questions remain as to the significance of the amino acid sequence comprising the structure around the chromophore and its importance to the spectral properties of the protein. The large size of the protein also brings challenges to studies involving passive diffusion.

Efforts to answer questions about the amino acid sequence's importance to the relative fluorescence of sfGFP are described herein. Work is being done to determine if loop truncations or β-sheet truncations are more effective in reducing the overall size and what necessary amino acids are involved in maintaining the fluorescence.