Sample only

**Specific activities to be undertaken and a timetable allotted for each activity:**

*(example 1)*

**August-September 2015**

The Y173F* mutant protein will be analyzed by Fourier Transform Infrared Spectroscopy (FTIR). Work will begin on cotransforming the stock plasmids F112F* and F420F* into the RG145 expression strain.

**October 2015**

Express and purify F112F* and F420F* ubiquinol oxidases. Purification will be accomplished using FPLC (Fast Protein Liquid Chromatography). The FPLC column used will be a nickel column, which has an affinity for the histidine tag that will be incorporated in the UbO during expression.

**November 2015**

Verify the purification and identities of F420F* and F112F* ubiquinol oxidases by FTIR or mass spectrometry. Perform proton pumping and quinol oxidation assays. Begin expressing other mutants.

**December 2015**

For F112F* and F420F* UbO, the O, R and PM oxidation states will be isolated and analyzed by FTIR. Other mutant proteins will be purified.

*(example 2)*

In our research team, we have collected a group of BOLD data for healthy and PAD patients, with all data acquired during exercise recovery. The first part of my project involves segmenting different muscle groups of the calf and generating their T2* versus time curves. To better localize the muscle groups, I will first study the anatomy of the calf muscle, and for each data set, view a high-resolution anatomic image. To eliminate the impact of intramuscular vessels or fat, we will also consider excluding some very bright or dark voxels. For fast processing, I will program with MatLab to perform all computations, graphing, and region-of interest (ROI) drawing. This portion of the project should require 2 months.

In the second step in the project, we will analyze the temporal change of T2* during the exercise recovery for the cases. To quantify the change, we will find a proper mathematic function to fit the temporal curves, and use the parameters of the function for quantification. This will involve creating a MatLab program to fit the curves with optimization techniques and evaluate the curve-fitting residues. This step should take 4-6 months.

The final step will be to use statistical analysis to determine the optimal threshold for the curvature parameters to differentiate PAD patients and healthy subjects. This step should take until April 2016, and will include preparing all results for submitting a journal paper and/or abstracts to major national or international conferences.