ParaLens Advance - Phase II

Overview
The current ParaLens Advance utilizes a low-intensity blue LED to conduct fluorescence microscopy. The sponsor wanted to create a phase II design that would utilize higher-intensity blue, green, amber and UV LEDs to increase the capabilities of the current product. To achieve this, the increase heat given off by the LEDs needed to be managed, so that the internal mechanisms would not fail.

Objectives
The main objective of this project was to develop a second-generation version of the ParaLens Advance that would properly manage the heat from higher-intensity LEDs and increase the capabilities of the current device.

Approach
• Interviewed sponsor, read sales materials and researched fluorescence microscopy
• Created a concept generation matrix and from that, selected a top concept to pursue
• Reviewed past patents for the concept of the existing model
• Researched patents to ensure that our concept was not already patented by another entity
• Visited the sponsor about every two weeks to gather feedback and information from them, so that our progress was in line with their expectations
• Utilized basic scoping calculations to determine the necessary amount of airflow to effectively manage the heat given off by the high-intensity LEDs
• Developed CAD models for our main prototype and subsequent backup designs
• Fabricated a beta prototype to display our product concept
• Performed testing with the LEDs and fiber-optic cables to ensure heat was properly managed
• Ensured that the LED light sources were safe for use in the optical instruments
• Tested the effectiveness of the LED lights on infected blood samples

Outcomes
• Sponsor will be able to utilize higher-intensity LEDs without having to worry about device failure
• Higher-intensity blue LED will allow for improved use results for malaria and TB blood stain tests
• Addition of high-intensity green, amber and UV LEDs allows for expanded capabilities and ability to use other fluorescent assays/techniques
• Improved “box model” allows for different combinations of LEDs to be made available to customers based on their specific environments and testing needs