

# A miniature microscope for fluorescence imaging

**Client:** Prof. Matthew Merrins

**Advisor:** Professor Jeremy Rogers

**Team:**

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**Problem Statement:** An affordable miniature fluorescence microscope needs to be developed the excitation source should be an LED with a wavelength of 430nm and filters will be required to filter 470 nm and 535 nm light.

**Last Week's Goals:** Order LEDs and start desing of swapping filters.

**Summary of Team Role Accomplishments:**

- John: Research programs to control LEDs. Discussed filter swap ideas with Kaitlyn and Zach.
- Kadina: Emailed Professor Merrins to explain how we are planning to test the design. Researched Arduino code for designing the LED set-up.
- Kaitlyn: Updated team website for mid-semester deliverables.
- Zach: narrowed microscope stage setup and chose preliminary filter swap mechanism for further verification

**Summary of Design Accomplishments:**

- Ordered LEDs and LED driver.
- Found the camera and excitation specifications of Prof. Merrin's setup
- Begun designing a mechanism to swap filters
- Researched programs to control LEDs via Arduinio

**This Week's Goals/Individual Goals:**

**Kaitlyn:** Come up with possible filter swap design ideas for the motor.

**Kadina:** I want to work on the Arduino program so that it is ready when the LEDs and integrated circuit come in. If the LEDs come in I would like to help build the circuit.

**Zach:** find parts/design feasibility for microscope mechanical setup. Verify and model current filter swap mechanism

**John:** My goal this week to is to program the Arduino so that we can test our LEDs quickly.

### **Project Difficulties:**

Waiting for equipment to arrive so that we can assembly and test excitation light source. The objective we want to order does not give a field number.

### **Same Challenges:**

- Picking out a specific tube lens with proper focal lense.
- Address the problem of bleed through
- Automate the image processing.

### **New Challenges:**

- Test LEDs when they arrive
- Figure out how to arrange in LEDs in such way to test them on Prof. Merrins set up

### **Tasks Completed by Team Members:**

**Kaitlyn:** Developed design ideas to move filters.

**Kadina:** Emailed Prof. Merrins about ordering LEDs and LED driver.

**Zach:** Developed design ideas to move the filter wheel

**John:** John researched ways to program Arduino to control the LEDs.