

# OCN 318 Project Proposal

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# Project Idea and Reasoning

- In my lab, we are studying the bromeliad ecosystem, and the interactions with microbes and invertebrates
  - I'm working with mosquitoes, fungi, and bacteria
- I want to study the respiration rates of microbes within bromeliads and see how different media affects the metabolic productivity of fungus.
- Respiration rates can give an insight into the biological productivity of microbes, and how much stress they are under
  - Higher respiration = higher productivity
  - Lower respiration = more environmental stress
  - Testing different media types to see what has the highest level of productivity could allow for more efficient culturing and isolation in future experiments
- I also want to observe humidity and temperature, as fungus grows better in warm and wet conditions, so noting the data of that would be beneficial to provide context about growth rates that may not be related to media.



# Tasks needed

- Collect bromeliad water samples and grow out fungus on plates.
- Isolate the fungus, collect at least 5 morphologically distinct fungal samples. Ideally, they will be samples that my coworker is sequencing later in the semester.
- Once isolated, regrow on a new plate, and place a carbon dioxide sensor within the petri dish. Foil shut to prevent carbon dioxide from escaping and prevent light affecting the experiment.
  - Two plates will be used for one fungus. One will be potato dextrose agar, and another will be malt extract agar. Both will have the antibiotic Chloramphenicol to prevent bacterial growth. They will be read one after another, so the same fungi will be monitored over a 4 day period.
- Take readings for 48 hours every 20 minutes.
  - Total of 144 readings.
- Repeat this for the amount of samples that can be sequenced later, and collect data.
- Attach LED pixel stick to both sensors to provide a visual representation of respiration rates, humidity, and temperature.
- Calculate the average change in carbon dioxide concentration, and the average temperature and humidity
- Graph the data using matlab to look for correlation between respiration, temperature, and humidity



# Materials Needed and Cost

- Plates and media material (Petri dishes, MEA, PDA, and Chloramphenicol) - 0\$, already provided in my paycheck
- Sampling materials (pipette, petri dish, tubes) - 0\$, already provided in my paycheck
- Culturing tools (Hockey puck spreader, ethanol, burner, parafilm, foil) - 0\$, already provided in my paycheck
- [High Density Neopixel x 3](#) - \$19 for 10, leave 4 for the class, keep 3 extra in case the pixels break
- [Adafruit SCD-30 - NDIR CO2 Temperature and Humidity Sensor](#) - \$59
- [Male to Male cables](#) - \$7 (Unless provided by lab)
- [390 Ohm Resistors](#) - \$6 (Unless provided by lab)
- [Solder wire](#) - \$6 (Unless provided by lab)
- Soldering Iron - \$0, in the lab

Total with materials that the classroom has: \$78

Total without materials the classroom has: \$97

# Thanks!

