

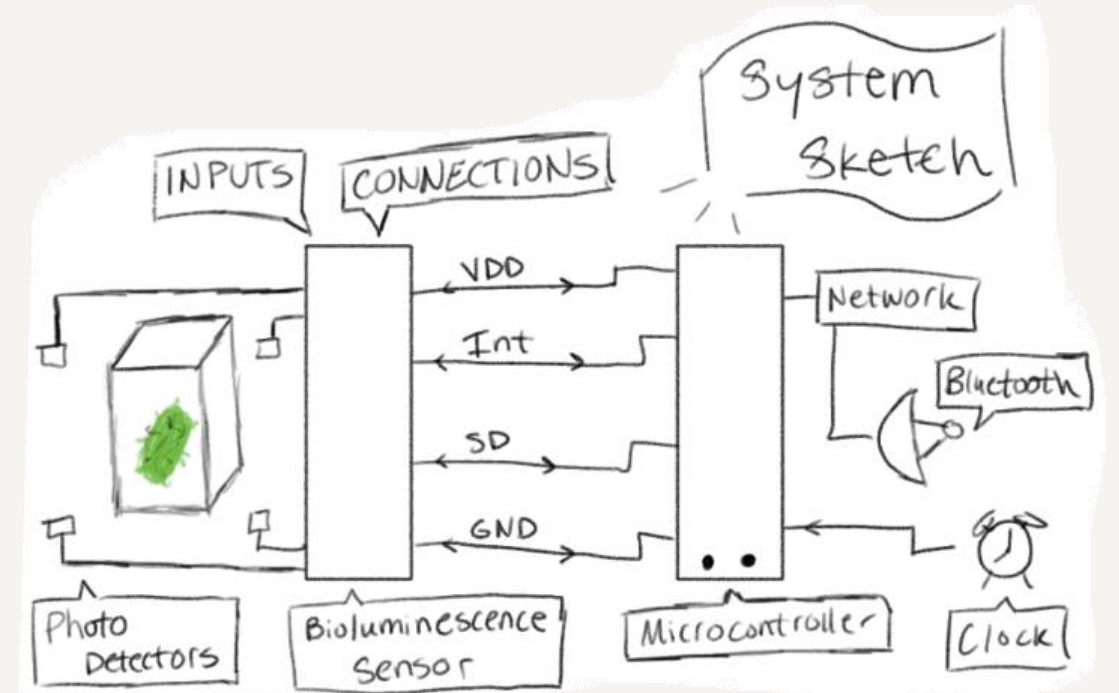
Product Research

SDMAY25-17

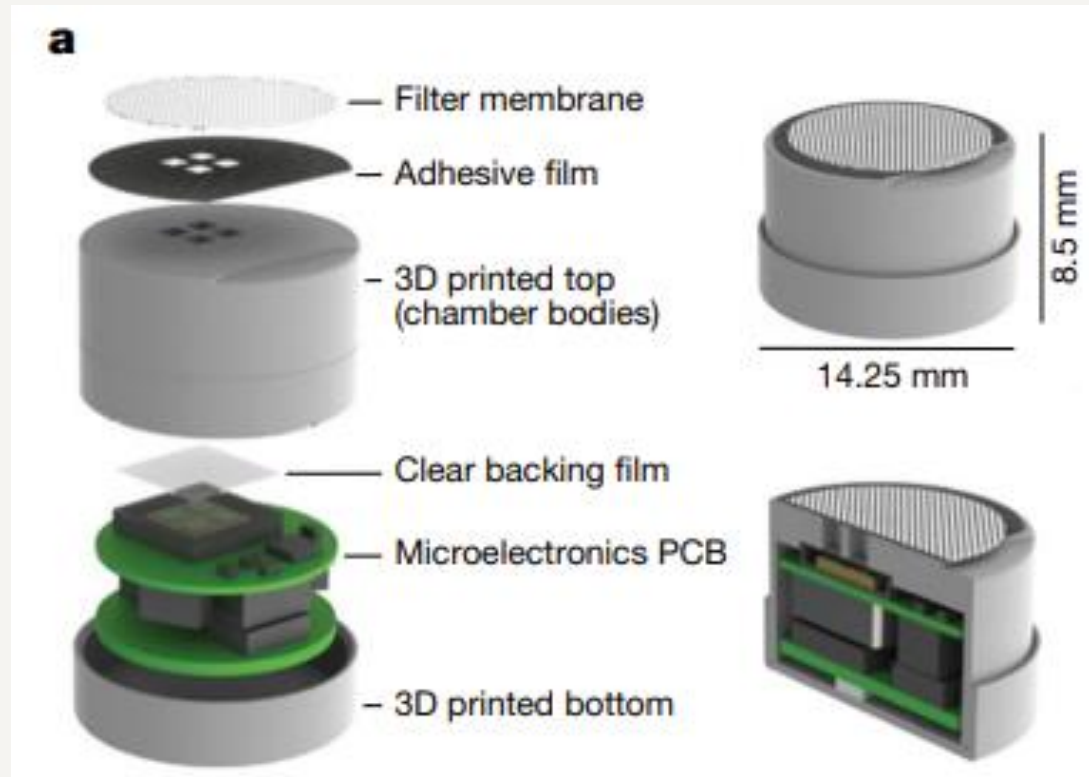
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Project Overview

- Develop an Electrical system that will house, monitor, and transmit data that is collected from a bio-engineered biosensor.
- Monitor and control the temperature of the housing unit to maintain cell growth.
- Create a circuit that will excite the biosensor with an LED, as well as a circuit to collect the emitted response.
- Transmit the collected data through a Low-Energy Bluetooth connection.



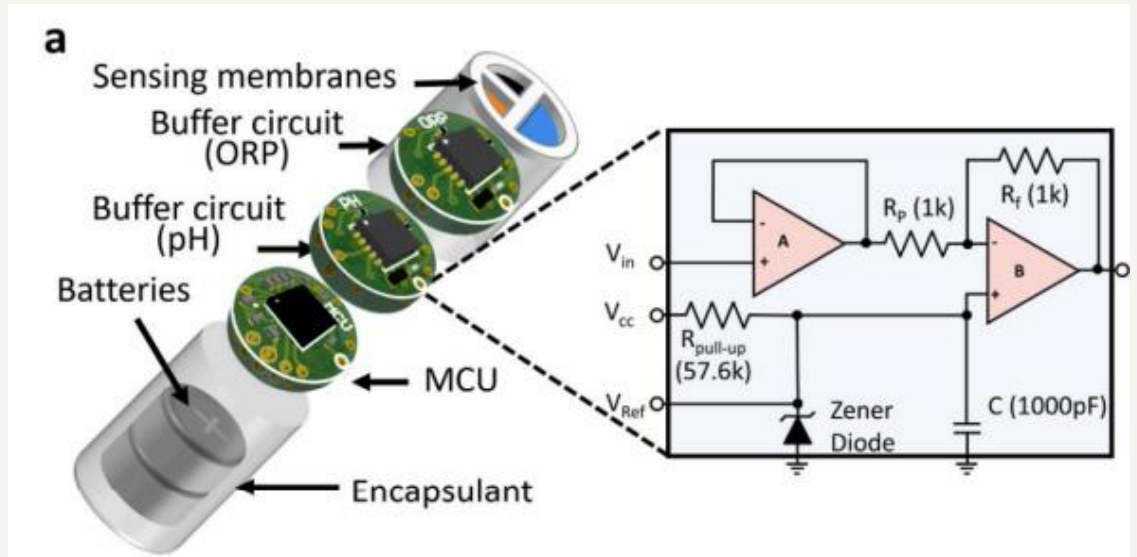
Related Projects: Detecting Inflammatory Biomarkers in Pig Intestines



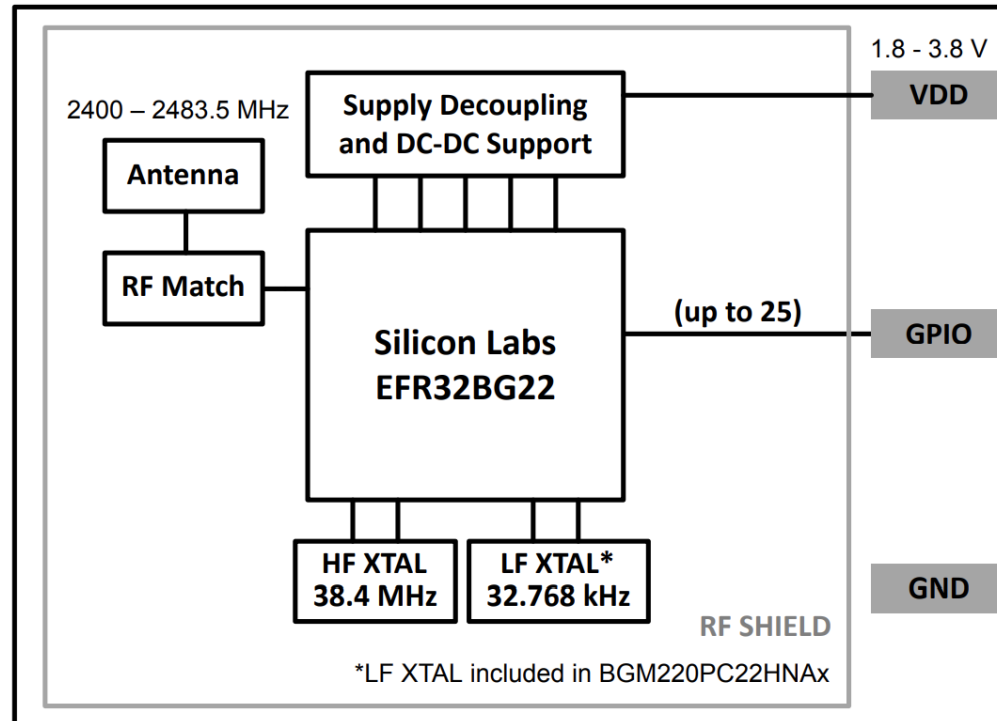
- High Energy Cost
- No way to replace biosensor or batteries
- Only able to detect one specific analyte
- Consumable product for livestock, not safe for human consumption

Related Projects: Smart Capsule for Monitoring Inflammation in Gastrointestinal Tract

- Low Power Bluetooth Data transmission
- Biosensor Membrane rather than Biosensor Colony
- Non-reusable after passing through one trip
- Consumable Product for Humans



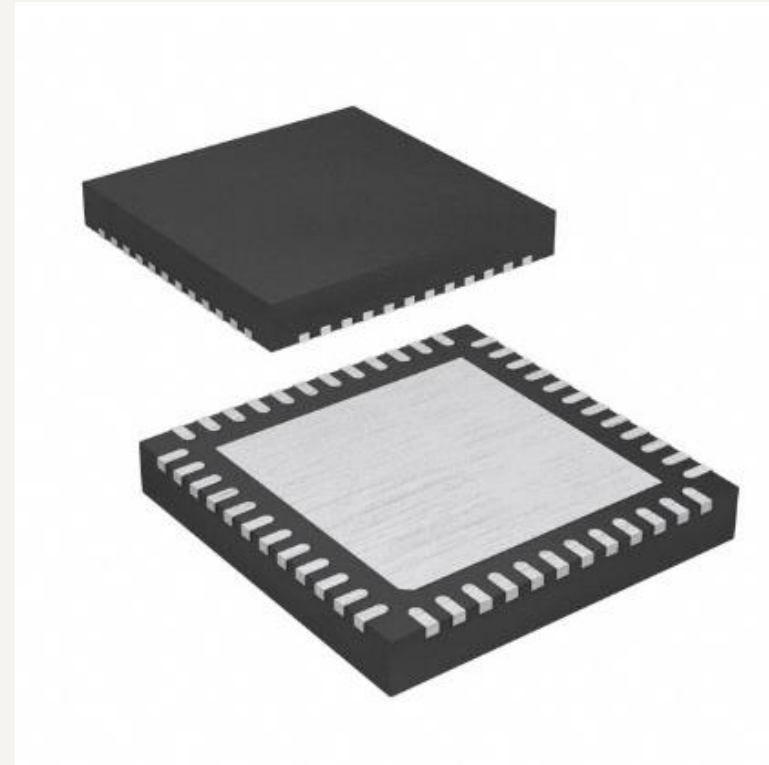
Related Components: Optical Sensors to Monitor Metabolic Activity



- Measures frequency of light emitted instead of amplitude or strength
- Monitors growth through measuring specific early growth stage biomarkers
- Component too large for us to use in our design

Related Components: SNRF52832 MCU

- Low-power Bluetooth transmission
- Small in size, 4x4mm
- Requires high voltage supply, which requires larger batteries
- Reported failures in data transmission when applied



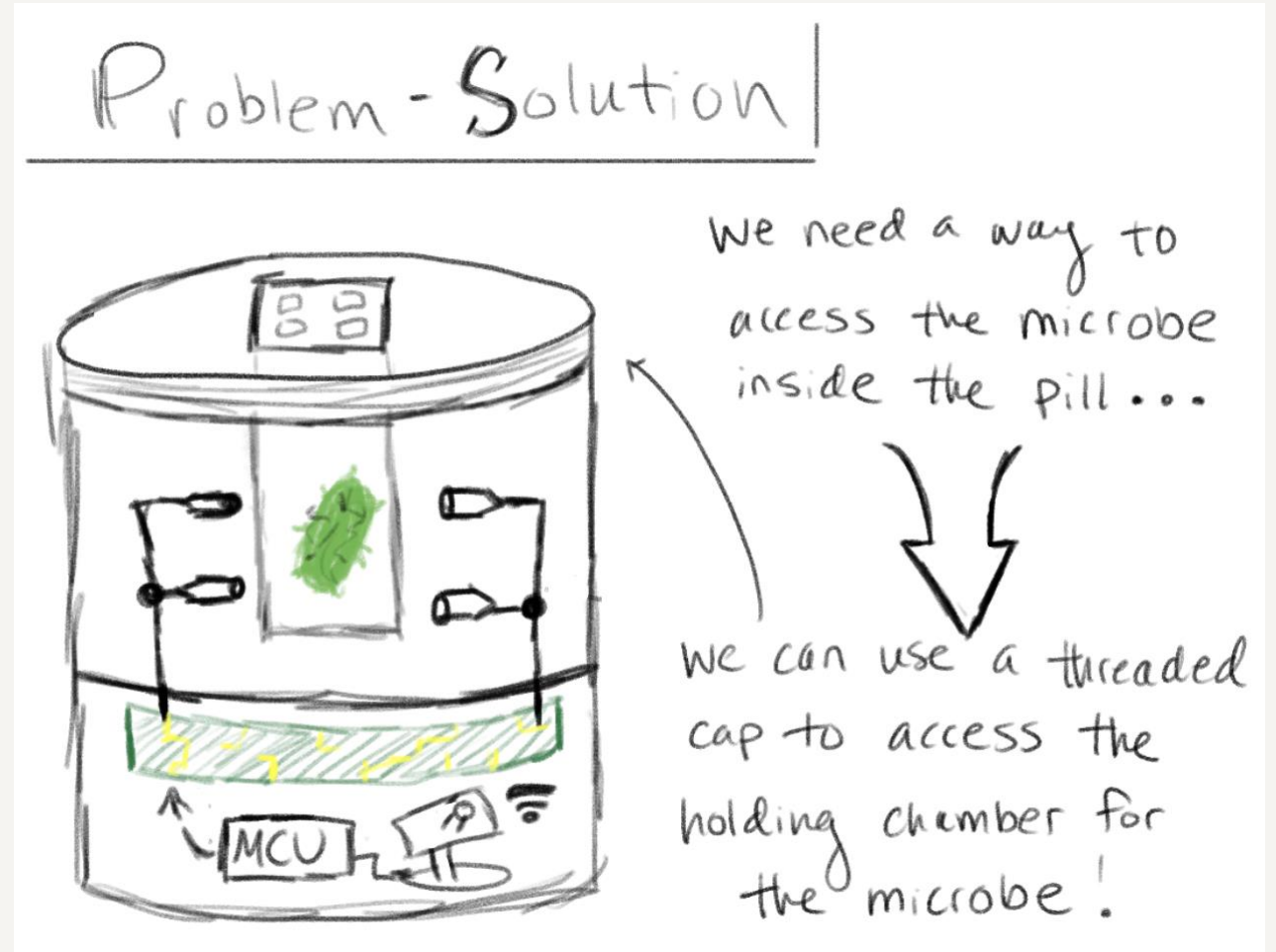
Related Components: AS7341-11-Channel Visible Light Sensor



- Flicker detection ensures reliable performance in fluctuating light environments
- Transmits the accurate color and wavelength data through Bluetooth signal to device.
- It has High Power Consumption
- It has -30°C to 85°C operating temperature range

Market Gap & New Ideas

These products we have been researching have all been specific to sensing bio-electrical properties inside an organism's body. Our project is going to tackle a more general use of sensing bio-electrical properties in an arbitrary solution (i.e. in a lake or river). This will allow us to design a generic sensor package that researchers in industry can then use with their own engineered microbes for their own specific use cases.



Conclusion

- Most other products are made for very specific applications, so their components and functions are not as transferable to our problem.
- Depending on energy requirements and what our Client desires, the researched components could be included in our design
- Our product needs to have different functionality as compared to the other products we reviewed:
 - Low-Energy Bluetooth Connection
 - Temperature monitoring and controls
 - Excitation and Emission circuits

Questions and Comments

