Colorimetric Sensors for Iron Detection in Water Samples

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INTRODUCTION & PROJECT AIM

- At low concentrations, copper and iron ions are necessary for life, but high levels can be detrimental to health and aquatic ecosystems.

- Previous sensors were developed for analysis of iron in blood samples.

Figure 1: Blood Iron Sensor Schematic

50 ul blood sample

Layer 1
Layer 2   Reference area
Layer 3
Sensing area
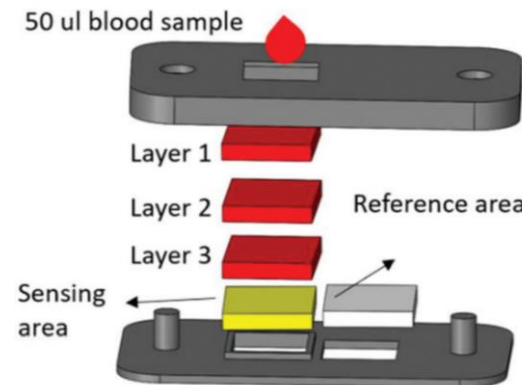
- Can these previously developed colorimetric sensors be an accurate, cost-effective alternative for testing the concentration of iron ions in natural water samples.

- Calibration of the sensors with water-based samples and experimenting with how different variables impact sensor readings.

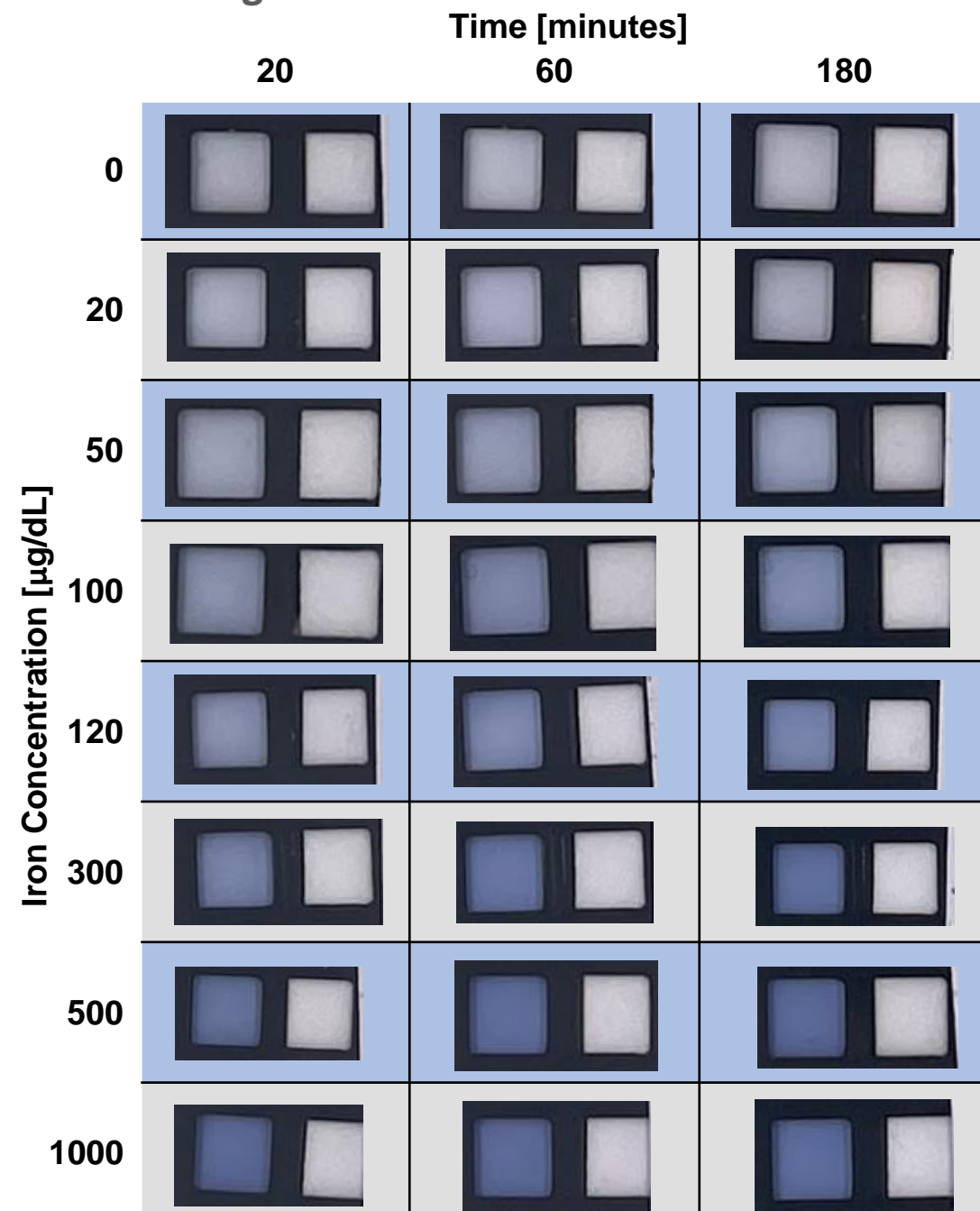## PROGRESS

Figure 2: Iron Concentration vs Time

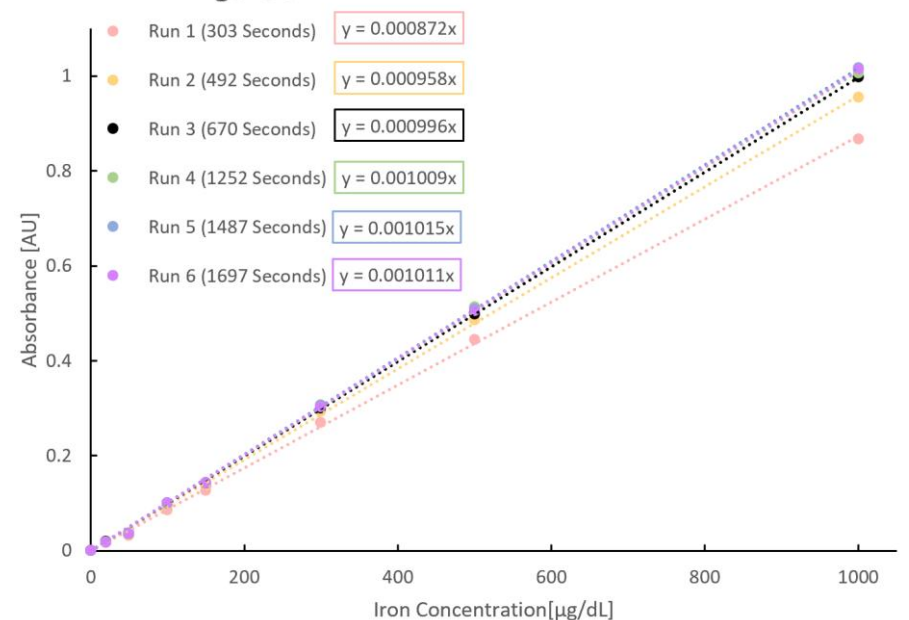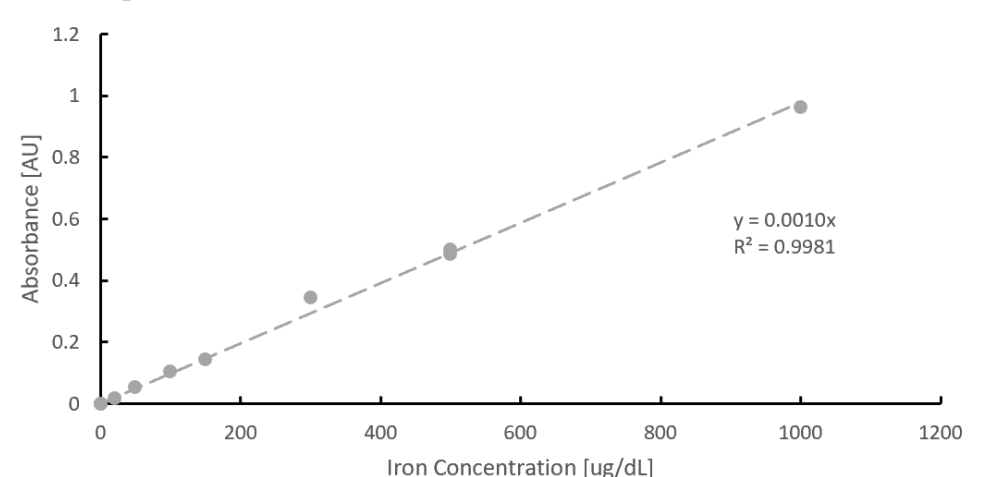**Figure 3:** Absorbance vs Iron Concentration

- Run 1 (303 Seconds) $y = 0.000872x$
- Run 2 (492 Seconds) $y = 0.000958x$
- Run 3 (670 Seconds) $y = 0.000996x$
- Run 4 (1252 Seconds) $y = 0.001009x$
- Run 5 (1487 Seconds) $y = 0.001015x$
- Run 6 (1697 Seconds) $y = 0.001011x$

Figure 4: Iron Concentration vs Absorbance after 20 min

$y = 0.0010x$
$R^2 = 0.9981$

- All experiments are completed in triplicates for increased confidence in results.

ONGOING WORK

- Testing iron concentrations in water sources.

- Conducting RGB analysis on sensors.

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ASU

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