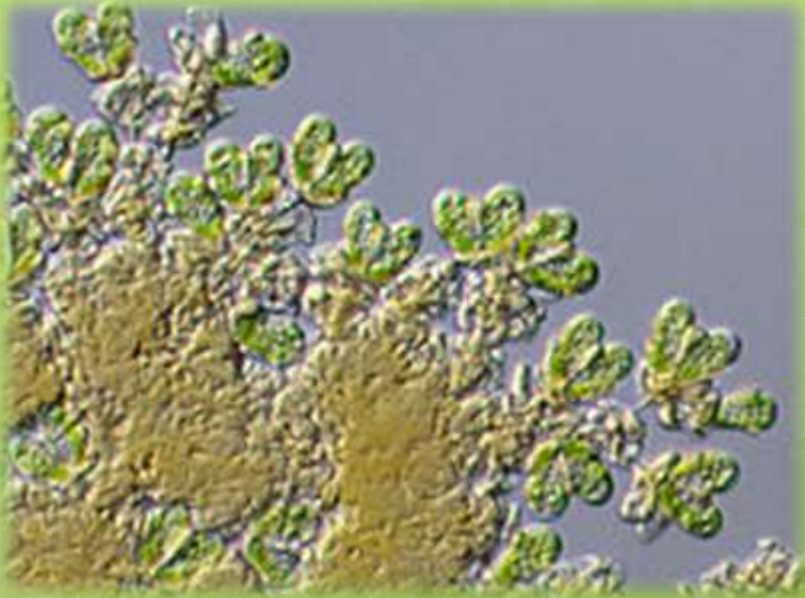


Studying Culture
Media for
Improving Growth
of Green Algae
*Botryococcus
braunii*



In Conjunction With:

- National Science Foundation Community College Innovation Challenge 2015
- “Optimizing Genetic Engineering Technology for Increased Lipid Production in Green Algae (*Botryococcus braunii*)”
- Top ten finalists will present in Washington D.C. June 2015

Not Just Pond Scum

A microscopic view of green algae filaments, showing a dense network of thin, green, thread-like structures. The filaments are intertwined and appear to be growing in a liquid medium, possibly water. The background is a light, yellowish-green color, suggesting a natural or laboratory environment.

- Grows Fast
- High Biofuel Yields
- High photosynthetic efficiency
 - Consumes atmospheric and waste CO₂
- Does not compete with agriculture
- Purifies wastewater (Phytoremediation)

Botryococcus braunii

- Green Colonial Microalga
- Promising candidate for biofuel production
- Accumulates a dry weight of 30% - 70% of hydrocarbons



Research Question

- What levels of nutrient concentrations in liquid medium will result in higher biomass yields?

Hypothesis

- BG-11 will result in higher biomass yields based on its higher nutrient concentrations.

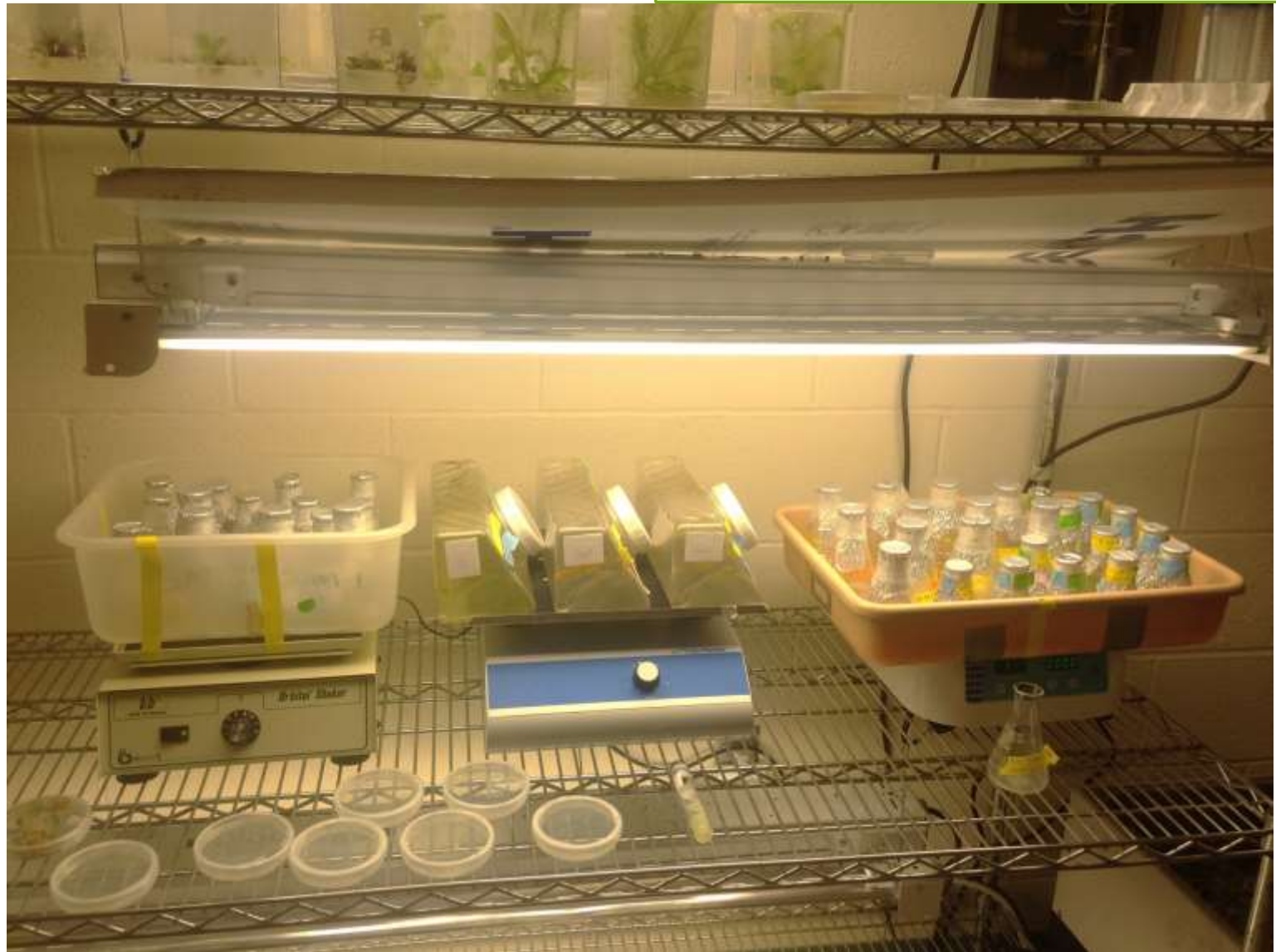
Medium Candidates

- Differences of significant levels of nutrient concentrations
- Specific purpose of each medium
 - Most are designed for Blue-green algae
- Chu No.10, Chu No.13, Jaworski's Medium (JM), and BG-11

- Increasing efficiency increases the potential to become commercially developed as a biofuel resource

Preparation

- Stock algal cultures were grown in sealed 125 ml flasks using Chu No.10 medium as the nutrient supply
- Stock cultures were grown for 13 weeks on an orbital shaker ranging from 100-110 rpm under 16:8 light: dark photoperiod
- Every 1-2 weeks, the cultures were transferred to fresh medium.

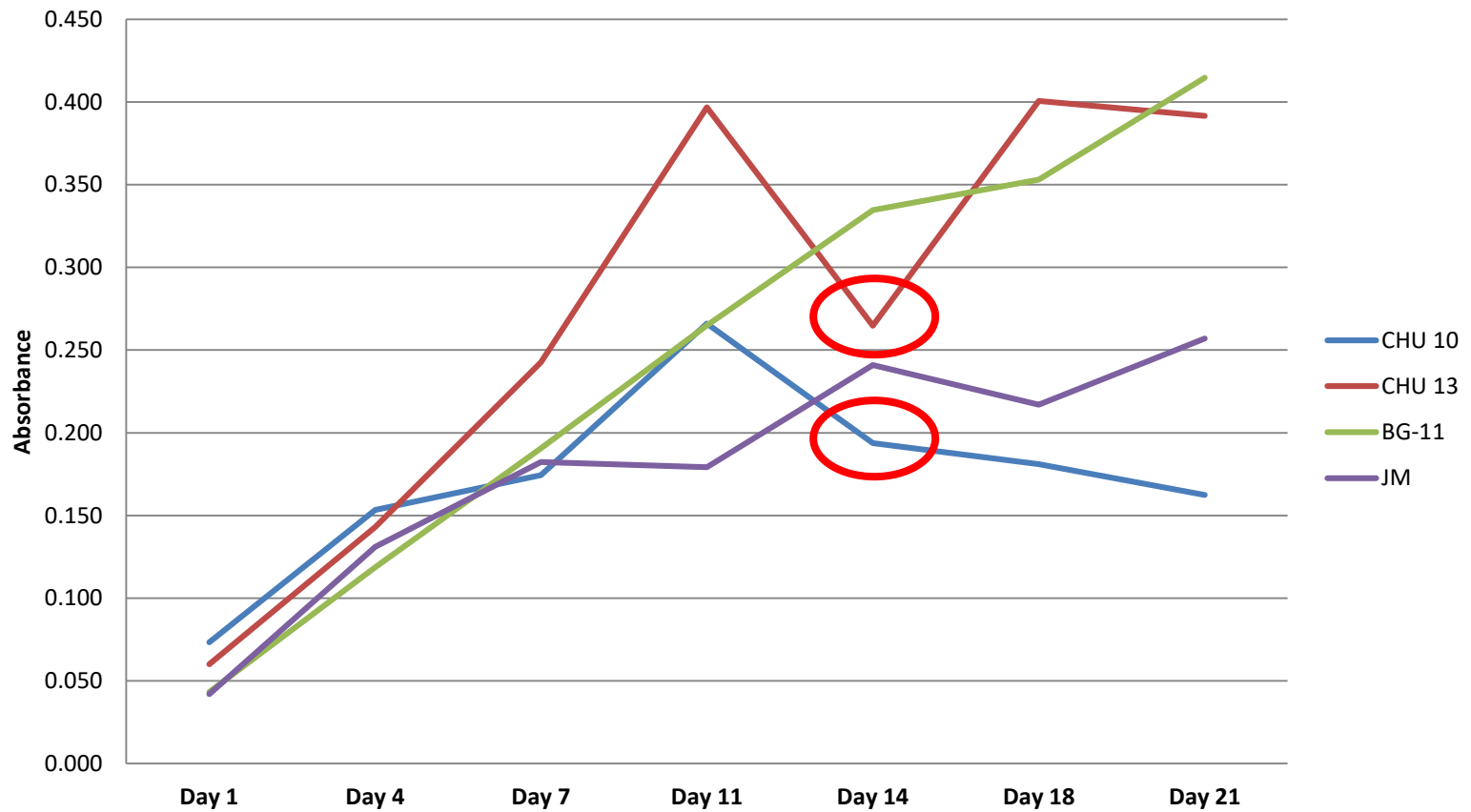


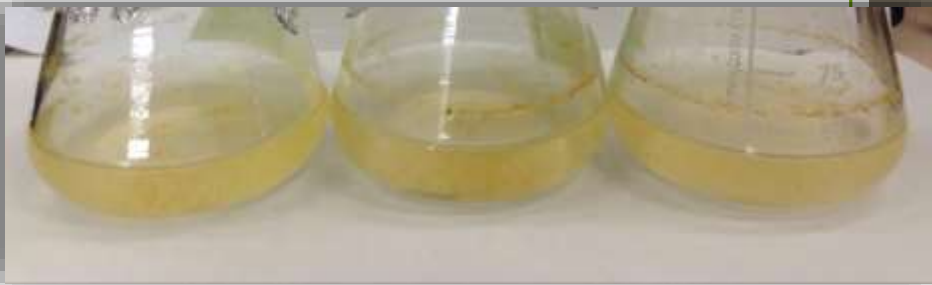
Procedure

- Three replicates of each medium
- Using Optical Density (OD)-
 - Initial OD was measured
 - Twice a week OD was measured again
 - Visual results were also recorded
 - Homogenized
 - Clumping
 - Film
 - Physiological changes

Data

B. braunii Growth Rates





Chu No.10



Chu No. 13



BG-11



Jaworski's Medium

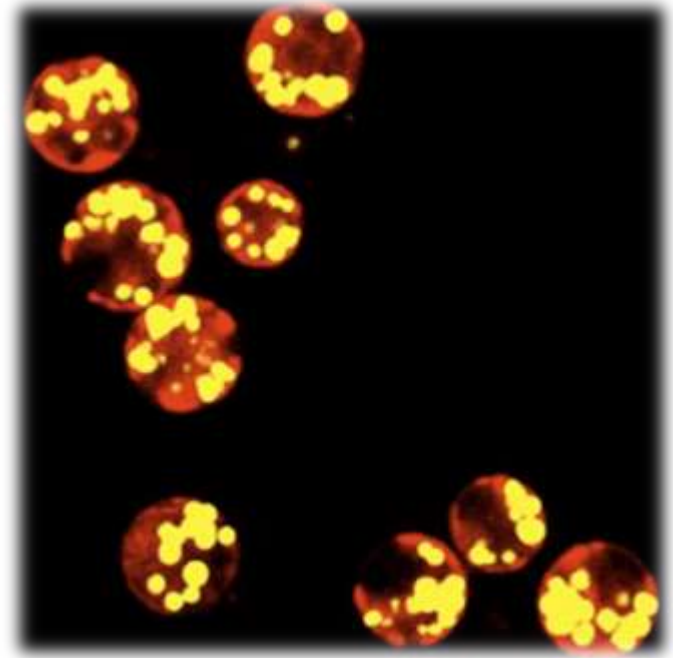
Results

- Chu No. 13 remained the most homogenized
- Chu No.13 had the greatest growth spike
- BG-11 continues to grow
- Chu No. 10 is first start showing physiological distress (yellow/orange)

What is the next step?

- Hydrocarbon analysis
 - Nile Red Stain
 - HPLC UV
- Physiological differences

- Continue growing algae!



QUESTIONS?

