BIOL 1107 – Building Life from Non-Living Components – Mathews
Data taken from *Integrating Concepts in Biology* textbook

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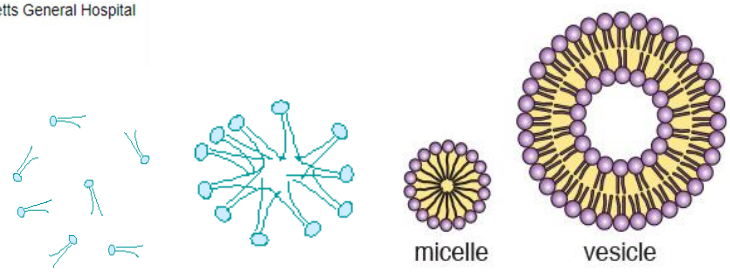
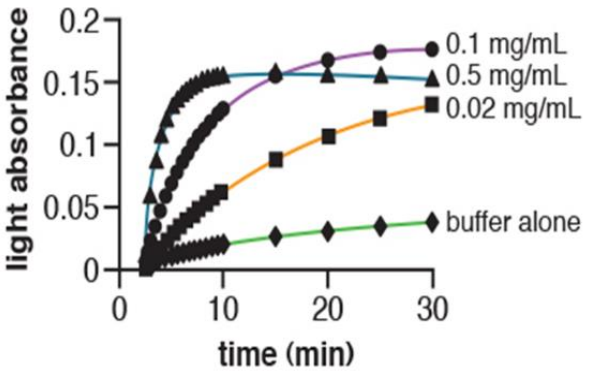
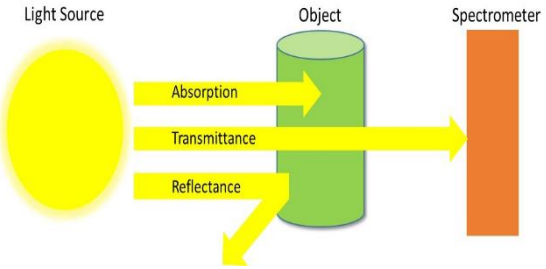
The Nobel Prize in Physiology or Medicine 2009



<u>Research Question 1:</u>
Can we create a self-contained package that has separate internal and external environments?

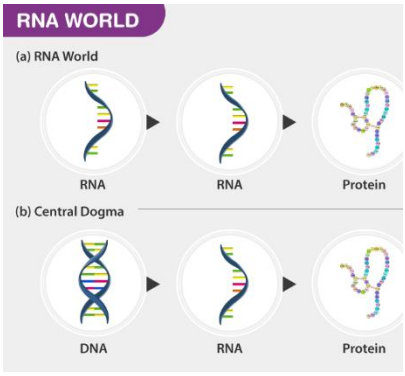
- Hypothesis 1:
- Prediction 1:
- Result 1:
- Conclusion 1:

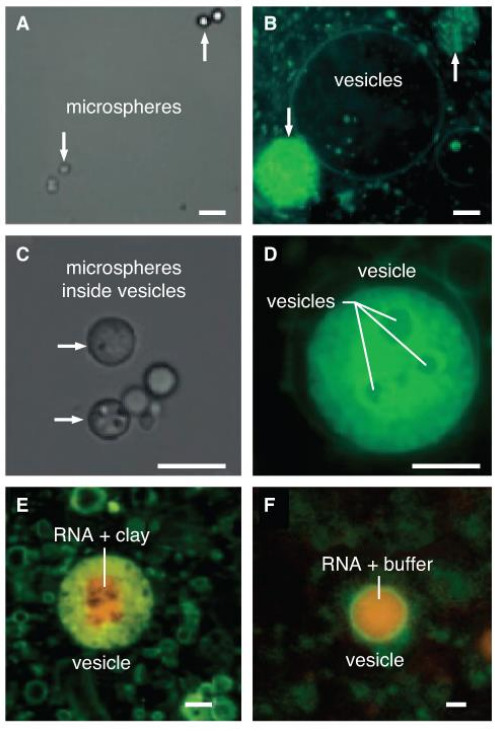




<u>Research Question 2:</u>
Can abiotic vesicles acquire and store other molecules needed to function as living?

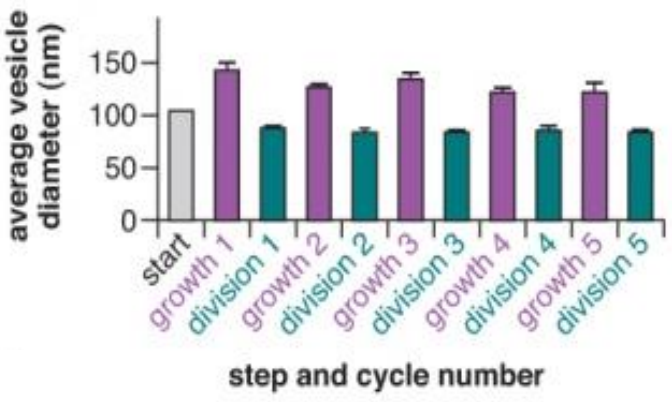
- Hypothesis 2:
- Prediction 2:
- Result 2:
- Conclusion 2:





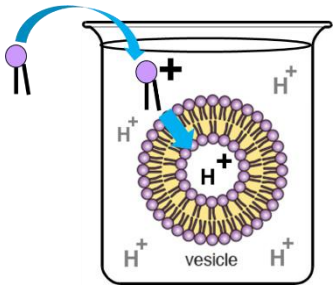
Research Question 3:
Can abiotic vesicles grow and reproduce?

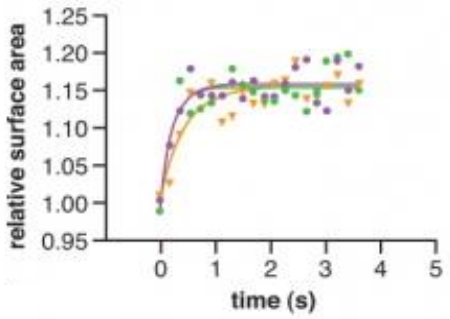
- Hypothesis 3:
- Prediction 3:
- Result 3:
- Conclusion 3:

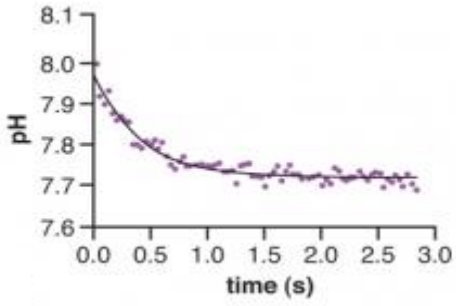


Research Question 4:
Can abiotic vesicles acquire and transform energy?

- Hypothesis 4:
- Prediction 4:
- Result 4:
- Conclusion 4:







Summary:
Laboratory research has shown that non-living components (lipids & nucleic acids) can come together in water to form vesicles that function like living things (store genetic information and energy, grow/change, replicate, and respond to their environment).

Reflection:
Given the evidence presented, are these vesicles living cells? Why or why not?

If they were living, would they be considered prokaryotic or eukaryotic?

For more information on this research, please check out http://exploringorigins.org/about.html and https://molbio.mgh.harvard.edu/szostakweb/index.html.