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Independent Study and Mentorship

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**Organic Carbon Cycle**

**Assessment 5 - Research**

**Date:** 10/5/18

**Subject:** Biological Chemistry

**MLA Citations:**

Folletta, Christopher L., et al. "Hidden cycle of dissolved organic carbon in the deep ocean."

Proceedings of the National Academy of Sciences of the United States, vol. 111, no. 47,

2014, p. 16706+. Academic OneFile,

http://link.galegroup.com/apps/doc/A393098899/AONE?u=j043905010&sid=AONE&xi

d=aeeb4e67. Accessed 3 Oct. 2018.

**Assessment:**

In this research assessment, Christopher Folleta wrote an insightful article about an experiment that provided an unprecedented view of the ways in which marine dissolved organic carbon (DOC) moves through the marine carbon cycle. By analyzing serial oxidation experiments to quantify the isotopic diversity of DOC, Folleta and his team found a hidden cycle of organic carbon in the ocean. Such fascinating discoveries help to measure the quantitative amounts of carbon around the world. However, this raises new questions such as: how does the Earth’s atmosphere become influenced by the organic carbons found in the ocean and how is the radiocarbon age a primary source of quantitative data?

Prior to these new questions, this research assessment cleared up questions from previous research assessments, career outlook projects, and other overall topics. For example, I was unsure about how biological chemistry unveiled timescales of isotopes. After analyzing and assessing this article, I came across a method called bulk isotopes that helped determine the microbially sourced DOC reservoir with two distinct components of differing radiocarbon age.

Before completing this assessment, I was interested in genetic DNA and genealogy methods associated with biochemists. However, after much research, I found environmental biological chemistry equally intriguing. The depth to which both subtopics of biochemistry focus towards is astonishing and I wish to continue learning in-depth about both environmental and genetic biological chemistry. In the future, I plant to somehow incorporate these subtopics into an original work idea that benefits my community as a whole.

After completing this research assessment, I was able to make connections to previous knowledge from Pre-AP biology and AP Environmental science from freshman and sophomore years (respectively). Ecology and food webs in both these classes was a significant part of the curriculum and helped to describe the interactions among living things. Similarly, this assessment addressed how the oceanic microbial food web interacts with climate on both short and long timescales and their influence on organic carbon reservoirs.

The information found in this article is relevant to my field of study, biological chemistry, as it relates biomolecules to its function and their importance in animal and plant life, one of the main goals of biochemistry as a topic. My focus of experimenting with genetic biochemistry has shifted to environmental biochemistry a a result of this article assessment. Although this article was much harder to comprehend than previous articles because of the advanced vocabulary and unusual symbols that represented isotopes and data, the information gained in this article was useful. I was able to take away how intricate analysis of isotopes is to the data of carbon cycle and what it reveals about the oceanic dissolved organic carbon (DOC).

In conclusion, I am pleased with the amount of information I was able to take away from this research assessment. In the future, I plan to take the knowledge gained about environmental and genetic biological chemistry and apply them to interview questions. I hope to gain as much insight on biological chemistry experiments and work environment through interviews and future mentor visits as I have on these research analysis.

Link to Annotated Document through Scrible:

[**Document**](http://scrible.com/s/4dU4C)