IT227 Biotechnology Lab II

Spring 2017

Reflection 1

Due Friday, February 10

Now that you have been immersed in the research project for this semester and become familiar with the software and technology we will be using as our research tools this semester, consider the following questions and answer as if you were providing an explanation to a fellow classmate that is not enrolled in this course:

* What is a gene?
* What does it mean to “call a gene?”
* How do you annotate a genome?

Reflect on your experience thus far and consider the following questions:

* What do you think is going well?
* What suggestions do you have for improvement?
* What are you learning that you can apply to your current major/career interests?
* What is your greatest take away or “aha” moment?
* What remaining questions do you have?

The guidelines for your research paper will be posted next week and two of the sections you will need to prepare include both an introduction and conclusion.

It is important to find primary sources and references that provide background and rationale for addressing:

* why is this an important research problem,
* what is the current knowledge in the field,
* what are the existing gaps in knowledge and understanding,
* how do your results help address this gap and
* what are your ideas for future research based upon your results from the semester.

This week, we will begin to work together and collaborate to develop a list of annotated primary literature for the course that can help you begin thinking about the literature foundation of evidence you will provide for your introduction and conclusion in your research paper.

* Find a reference that you think is interesting and relevant to the phage research project.
* Next, post the Purdue libraries link with the citation in APA format to the Blackboard discussion board (you can access the Discussion Board from the link in the Blackboard course in the left-hand panel) so that others enrolled in the course can read it too.
* Then provide details in your post to answer the following questions:
  + Provide a brief summary of the paper.
  + Why did you select this paper?
  + What did you find interesting and how does it relate to the phage research project?

**Please copy the details that you posted in the discussion board and share in this reflection assignment for grading.**

This activity will help us build a cumulative bibliography among the class.

To begin thinking about the impact of your results and ideas for future research, here are some helpful resources to consider:

* iBioseminar from Professor Graham Hatfull entitled, “II. Bacteriophages: Genomic insights (<http://www.ibiology.org/ibioseminars/microbiology/graham-hatfull-part-2.html> )” and “III. Mycobacteriophage Genomics (<https://www.ibiology.org/ibioseminars/microbiology/graham-hatfull-part-3.html> )
* TedTalk “We can edit our DNA but lets do it wisely, (<http://www.ted.com/talks/jennifer_doudna_we_can_now_edit_our_dna_but_let_s_do_it_wisely?utm_source=newsletter_weekly_2015-10-24&utm_campaign=newsletter_weekly&utm_medium=email&utm_content=talk_of_the_week_button#t-93489> )by Jennifer Doudna, co-inventor of a groundbreaking new technology for editing genes. The tool, referred to as CRISPR-Cas9, allows scientists to make precise edits to DNA strands. It could lead to treatments for genetic diseases but there are also ethical considerations for this new tool.
* The following article was recently published and provides a great example for the potential impact of your research project this semester and the power of comparative genomics:
  + Watch the YouTube video: [Hatfull Nature Microbiology Paper Presentation](https://www.youtube.com/watch?v=KpLA6RkVRnc)
  + Read the paper: [Hatfull, et al Nature Microbiology Jan 2017: Prophage-mediated defense against viral attack and viral counter-defense](https://mycourses.purdue.edu/bbcswebdav/pid-8516755-dt-content-rid-34742215_1/xid-34742215_1)

If you are interested in exploring either of these topics in more detail, there are many recent publications on both phage genomics and the CRISPR system that can be accessed online through the Purdue Libraries.

There are also many resources at both the SEA PHAGES website and the Phages Database website that can help guide you as you work on your phage research project. In addition to the software links and annotation guide that you have been using, both sites also have a collection of primary research papers. These papers can help you begin thinking about the broader impact of your findings and how your work on this project fits into the bigger scientific community of phage researchers.

You can go to the SEA PHAGES website (<http://seaphages.org/> ) and select the “News/Pubs” tab to explore “publications”. Alternatively, you can go to phagesdb.org (<http://phagesdb.org/> ) and select “Publications” to explore the phage papers posted for reference on this website.