**IT22600 Final Paper**

**Rough Draft Due: Thursday December 1**

**Final Draft Due: Tuesday December 13**

Prepare a final scientific paper communicating your research findings from the semester.Although we recognize that there may be similarities in the data and documentation presented from students working on the same phage, each student should submit their own unique paper.

Your final paper should look like a journal article, including 2 columns and figures integrated throughout with appropriate titles. The following research paper can be used as an example to guide you as you prepare your paper. This paper describes the isolation and characterization of a bacteriophage and the techniques and results are similar to the protocols and figures you will share in your final paper. You can access this paper from any Purdue computer.

Kamimura, K. and Araki, M. (1989) *Isolation and Characterization of a Bacteriophage Lytic for Desulfovibrio salexigens, a Salt-Requiring, Sulfate-Reducing Bacterium*. Applied and Environmental Microbiology. 55 (3) 645-648.

Accessed at: <http://aem.asm.org/cgi/content/short/55/3/645>

Points for the final paper will be assigned as follows:

|  |  |
| --- | --- |
| Introduction | 20 |
| Materials and Methods | 20 |
| Results | 30 |
| Discussion | 20 |
| Literature Cited | 10 |
| **Total** | **100** |

**In addition to the format in the sample journal article, you should address the following important topics for each section:**

**Introduction**

* What are mycobacteriophage?
* Why is it important to study mycobacteriophages?
  + Why is your research significant?
* What is known about mycobacteriophages?
  + What research has already been done?
* What are you doing and why?
* ***At least*** 5 primary sources are required to support your statements

**Methods**

What did you do this semester? What protocols did you complete?

Your methods should have enough detail so that someone could repeat your experiment but you should not copy the protocol directly from the HHMI SEA phage discovery guide. You should cite resources for your protocols and follow the appropriate format for a scientific article.

The Table of Contents from the HHMI SEA Phage Discovery Guide can serve as a guide for the relevant protocols:

* Phage Isolation
  + Environmental Sample Collection
  + Direct Isolation
  + Plaque Assay
  + Picking a Plaque
  + Spot Test
* Phage Purification
  + Plaque Assay for Purification
  + Serial Dilution
  + Collecting Plate Lysates
  + Spot Titer
  + Full Plate Titer
* Phage Amplification
  + Making webbed Plates from a Lysate of Known Titer
* Viewing Phage Particles by Transmission Electron Microscopy
* Extracting Phage DNA
* Characterizing Phage DNA by Restriction Enzyme Digests
* Include appropriate references

**Results**

What data did you collect this semester? Your data should correspond to your methods section and should be presented as figures with titles and legends.

You should be able to provide evidence of:

* Data for Phage Isolation
  + - Sample collection---include GPS coordinates and a picture of your sample site
    - Data for direct isolation
* Data for phage identification
  + - What is the name of your phage?
    - Picture of original plate following the guidelines in Protocol 12.3: Taking Plaque Pictures
* Data for phage purification
  + - How many rounds of purification did you perform?
    - Representative pictures documenting the purification process
      * Your documentation should support that you obtained consistent plaque morphology
      * Describe plaque morphology including characteristics beyond size
  + Data for phage amplification
    - Lysate preparation
    - Calculation and titer of Lysate
  + Data for DNA Extraction, DNA Agarose Gel Electrophoresis and Restriction Enzyme Digest
  + Data for Electron Microscopy

**Discussion**

In addition to providing data, you should also discuss and provide an analysis of your results. Tell the story of the work you have done this semester.

Your discussion should mirror your introduction and provide a conclusion to the story you began in the beginning as you presented what is known and unknown in the field. What is the impact of your results on the field? What are the future directions for your research?