

Course Information: The Biology of Prokaryotes (BY360) – Colorado College.

Type: Research paper
Alternative oral seminar
Alternative poster

Professor Phoebe Lostroh

Level: 300

Advanced majors course that includes lecture, discussion of original literature and semi-independent laboratory work.

Block Plan Context:

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1							
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Important Features of the Assignment:

- **Staged**, allowing me to keep track of student progress and identify problems early on
- **Discipline-specific** writing for majors, helping them prepare for graduate school and use the many skills gained in other Biology coursework.
- **Discourages plagiarism** because each paper is completely unique.

Description of Assignment:

This description was written to address students directly.

Guide to the research paper (BY360)

You will prepare a 8-12 page research paper on a topic in prokaryotic biology. This project will be graded in three stages, detailed below. As explained in class,

Stage 1: Choose a general topic.

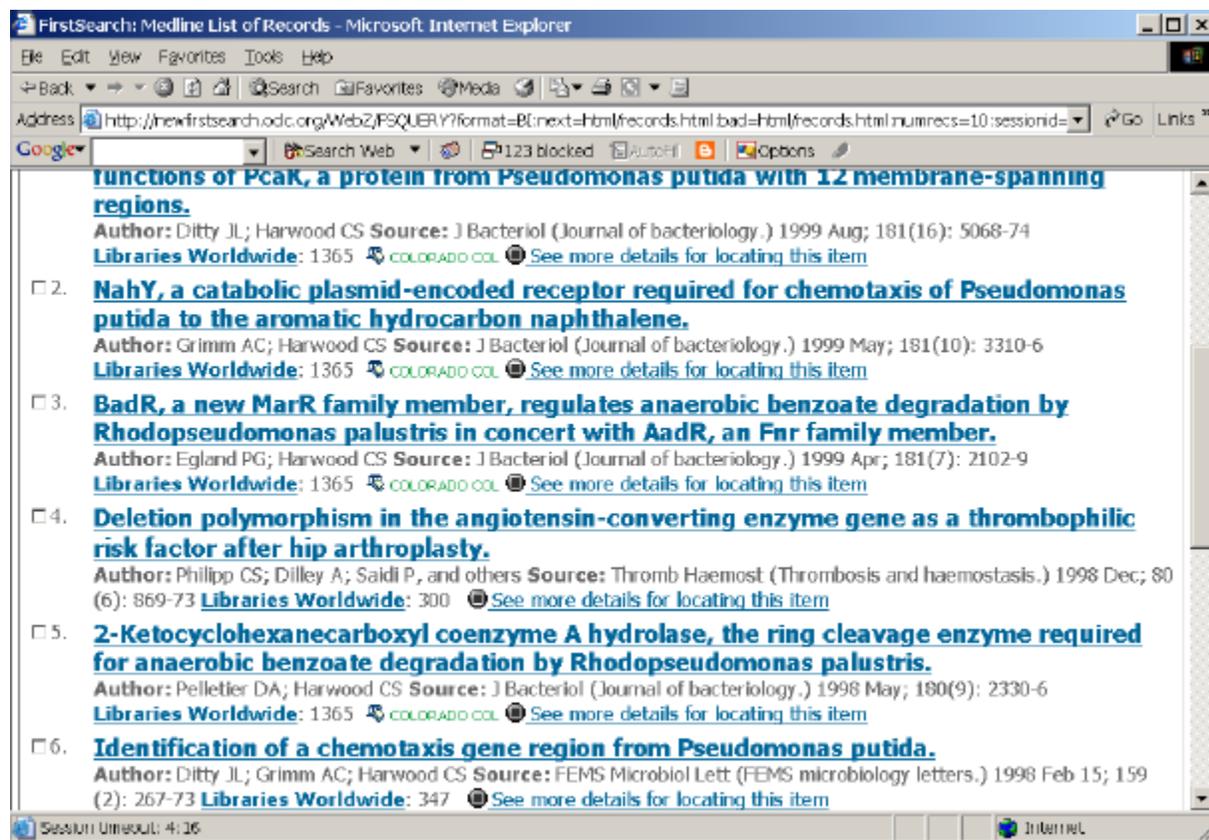
I have compiled a list of minireviews from the journals published by the American Society for Microbiology. Choose one of these as your starting material. The minireview you choose determines the topic for your paper, so choose wisely! Send me an e-mail explaining your choice. The e-mail must be received by Saturday morning, so the safest course is sending it to me on Friday afternoon. PDF files of the complete articles can be found online, through www.asm.org. An example of a minireview is “Shedding Light on Anaerobic Benzene Ring Degradation: a Process Unique to Prokaryotes?” CAROLINE S. HARWOOD AND JANE GIBSON, JOURNAL OF BACTERIOLOGY, Jan. 1997, p. 301–309. Accessed online at <http://jb.asm.org/minireviews.shtml> on 2 January, 2004. I won’t give any points to students who turn this assignment in late.

Stage 2: Choose two papers to critique.

The author of the minireview will likely refer to many publications. Choose one research paper referenced in the minireview. By their very nature, however, minireviews are a little “behind the times” simply by virtue of the time delay involved in writing and publication. Your second research paper should be published more recently than the minireview, and related somehow to

the first paper you choose. It might be, for example, written by the same last author, or written about a closely related phenomenon. E-mail me the citations on Friday, January 30. Be advised that Tutt library does not subscribe to every journal. Tutt does subscribe to Nature, PNAS and Science; furthermore ASM publications (e.g. J. Bacteriology, Infection and Immunity, and Applied and Environmental Microbiology) are available free after 6 months. You can use the search engines on the Tutt library web pages to ascertain whether other journal articles are available. An example of a paper discussed in the Harwood & Gibson review is Gibson, J., M. Dispensa, G. C. Fogg, D. T. Evans, and C. S. Harwood. 1994. 4-Hydroxybenzoate-coenzyme A ligase from *Rhodopseudomonas palustris*: purification, gene sequence, and role in anaerobic degradation. J. Bacteriol. 176:634–641. This paper is published in the Journal of Bacteriology, which is available in print at the library (the paper is too old to be found online as a PDF file).

To find a related research article published more recently, I used Medline through Tutt library and searched for the senior author, Harwood CS. Here are some of the articles I found:



Both Pelletier & Harwood 1998 and Eglund and Harwood, 1999 look like they would be relevant as well as freely available through Tutt. I won't give any points to students who turn this assignment in late.

Stage 3: Write a paper summarizing and critiquing the two papers. You will write a paper with three main goals. The first goal is to summarize the background relevant to the research papers you have chosen. Much of this material will likely be available in

the minireview. Strive to make connections to coursework. This introductory material may take 2-3 pages and use figures. The second goal is to summarize the experimental results presented in each of the two papers. This material will likely take 3-5 pages, not counting figures. Describe the techniques used. Excerpt key figures and describe the findings. Summarize the authors' interpretations of their data, usually found in the "discussion" section of publications. The third goal is to critique the work. This goal is the most difficult and will likely take 3-5 pages of text. What hypotheses were the authors testing in the data presented in the figures? Did the experiment performed really test that hypothesis? Did the authors use appropriate controls in all of their work? Are there alternative explanations of the data that the authors do not discuss or that they disfavor? Are there experiments the authors could have done to make a stronger case for their conclusions? Are any of their conclusions based on weak evidence? The critique should also compare and contrast the two papers. Did they ask similar questions or use similar techniques? Do they come to the same, or different conclusions? Did they test related hypotheses?

I will deduct 20 points from papers that are turned in after 5:00 p.m. I will not accept any paper after noon on Wednesday, February 11.

General guidelines

The paper should be 8-12 pages long, with 4-6 additional pages for all of the figures and the works cited. [Note: if an article is available as an html full-text document, high-quality figure images can usually be captured directly from the web site.] Use 12 point font and double-spacing, with one inch margins on all sides. In MS-Word, use the "view header and footer" function to add a page number and your name to the bottom of each page. Make sure that you cite your materials properly, and avoid plagiarism! Review the CC plagiarism guidelines before submitting your paper – professors are honor-bound to report any hints of plagiarism. If you directly excerpt a figure and include its legend, you must tell me that you have quoted the source! Refer to the lab manual's "Format for Scientific Papers" section for instructions on any figures or tables and the references section of the research paper.

Timeline:

Wk	<i>Monday</i>	<i>Tuesday</i>	<i>Wednesday</i>	<i>Thursday</i>	<i>Friday</i>	<i>Weekend</i>
1						Topic Due by e-mail 9:00 a.m. Saturday
2	Exam 1 (4 hours)				Lab report 1 Due (5-8 pages)	Research papers e-mailed to me by 5:00 p.m. Saturday
3	Exam 2 (4 hours)		Lab 2 report due (5-8 pages)			
4	Lab 3 due 9:00 a.m. in person; Work day for researched project	11:00 a.m. papers due; informal (ungraded) presentations	Final comprehensive exam			