Biology 522
Bacterial Genetics
Preliminary Syllabus
Spring, 2011

This course will meet MWF at 9-10 am in Wilson Hall room 133. It is anticipated that the enrollment will be 5-10 students including undergraduates who did well in Biology 422 and graduate students. The class will be largely discussion with only occasional (and brief) lectures.

There will be four reference books 1) C. J. Dorman, Genetics of Bacterial Virulence, Blackwell Scientific Publications, 1994 (QR175.D67 1994). This book while outdated includes a good survey of proteins associated with DNA and a helpful introduction to other topics. 2) Champness and Snyder, Molecular Genetics of Bacteria, ASM Press, 2003 (QH434 .S59 2003). This book is too elementary but it has good diagrams and will refresh your memory on many topics as well as provide coverage of some new topics. 3) D. White, The Physiology and Biochemistry of Prokaryotes, Oxford, 2007 (QR68 .W48 2007). This book will help with some topics such as protein secretion which we did not have time to consider in 422. 4) S. Baumberg, ed. Prokaryotic Gene Expression, Oxford, 1999 (QH 434 .P762 1999). This book contains a variety of useful review articles on gene expression in bacteria. Course topics will be studied primarily in papers from current journals and review articles. The material in the books will be used as an introduction or backup for various topics. In addition we will do some computer genome annotation and you will also build a simple evolutionary tree for a protein of your choice.

Tentative schedule

DATE	TOPIC
Jan 10	Introduction
Jan 12	General considerations about bacteria and their genetics
Jan 14	The bacterial chromosome
Jan 17	Holiday
Jan 19	Paper: Luria and Delbruck
Jan 21	Links between biochemistry and genetics
Jan 24	Transcription and regulation of transcription
Jan 26	Transcription and regulation of transcription
Jan 28	Paper on transcription
Jan 31	Protein secretion
Feb 2	Protein secretion
Feb 4	Regulation at the level of translation
Feb 7	Rewrite of paper
Feb 9	Plasmids, Conjugation, and Incompatibility
Feb 11	Plasmids, Conjugation, and Incompatibility
Feb 14	Papers on plasmids, conjugation, and incompatibility
Feb 16	Papers on plasmids, conjugation, and incompatibility
Feb 18	Regulation by small RNAs
Feb 21	Regulation of genes involved in pathogenesis and other complex processes
Feb 23	Regulation of genes involved in pathogenesis and other complex processes
Feb 25	Regulation of genes involved in pathogenesis and other complex processes

Feb 28	Genome rearrangements
Mar 2	Genome rearrangements
Mar 4	Genome rearrangements
Spring break	
Mar 14	Guest Professor Tony Richardson
Mar 16	Guest Professor Tony Richardson
Mar 18	Guest Professor Tony Richardson
Mar 22	Sequence analysis
Mar 24	Sequence analysis
Mar 26	Sequence analysis
Mar 28	Sequence analysis
Mar 30	Sequence analysis
Apr 1	Sequence analysis
Apr 4	Building trees
Apr 6	Building trees
Apr 8	Guest Professor Todd Vision
Apr 11	Student presentations
Apr 13	Student presentations
Apr 15	Student presentations
Apr 18	Regulatory networks
Apr 20	Regulatory networks
Apr 22	Holiday
Apr 25	Complete unfinished topics
Apr 27	Summary
May 6	8 AM Final Exam

*Each student will give a short presentation on a topic of his/her choice. The topic must be cleared with Dr. Matthysse by April 1. A trial run through of the presentation will be scheduled with Dr. Matthysse April 5 through April 9. The final presentation should incorporate the suggestions made during the trial presentation.

Grades will be calculated as follows: class discussion and participation 40% (10% each month, you will receive a monthly report), computer work 20%, class presentation 20%, and final exam 20%.