

Biology 522
Bacterial Genetics
Syllabus
Spring, 2009

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 This book while outdated includes a good survey of proteins associated with DNA and a helpful introduction to other topics. 2) Champness and Snyder, Molecular Genetics of Bacteria, ASM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 12	Introduction
Jan 14	General considerations about bacteria and their genetics
Jan 16	The bacterial chromosome
Jan 19	Holiday
Jan 21	Paper: Luria and Delbruck
Jan 23	Links between biochemistry and genetics
Jan 26	Transcription and regulation of transcription
Jan 28	Transcription and regulation of transcription
Jan 30	Paper on transcription
Feb 2	Protein secretion
Feb 4	Protein secretion
Feb 6	Regulation at the level of translation
Feb 9	Rewrite of paper
Feb 11	Plasmids, Conjugation, and Incompatibility
Feb 13	Plasmids, Conjugation, and Incompatibility
Feb 16	Papers on plasmids, conjugation, and incompatibility
Feb 18	Papers on plasmids, conjugation, and incompatibility
Feb 20	Regulation by small RNAs
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 27	Regulation of genes involved in pathogenesis and other complex processes

Mar 2	Biofilms Bob Bourret
Mar 4	Biofilms Bob Bourret
Mar 6	Biofilms Bob Bourret
Spring break	
Mar 16	Sequence analysis
Mar 18	Sequence analysis
Mar 20	Sequence analysis
Mar 23	Sequence analysis
Mar 25	Sequence analysis
Mar. 27	Sequence analysis
Mar. 30	Sequence analysis
Apr 1	Molecular genomics
Apr 3	Molecular genomics
Apr 6	Genome rearrangements
Apr 8	Genome rearrangements
Apr 10	Holiday
Apr 13	Genome rearrangements
Apr 15	Student presentations
Apr 17	Student presentations
Apr 20	Student presentations
Apr 22	Regulatory networks
Apr 24	Regulatory networks
Apr 27	Summary
May 4	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. Matthyse by March 26. A trial run through of the presentation will be scheduled with Dr. Matthyse March 28 through April 8. 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%.