

## HG541 Syllabus

Fall, 2009

Prerequisites for HG541 are courses in college-level Introductory Biology and undergraduate Genetics or Biochemistry. HG541 is not an introduction to genetics - it assumes knowledge of basic genetic principles.

Most reading assignments will be available at the course web site as PDF files or direct links.

**Check assignments prior to each lecture as some may change but may not be updated here.**

<u>Lecture</u>	<u>Faculty</u>	<u>Lecture Title, Reading Assignment</u>
1) 9/9, W	Robins	Introduction to Recombinant DNA Watson, Recombinant DNA, chapter 4
2) 9/11, F	Burke	Genetic Analysis: Concepts and Terms
3) 9/14, M	Robins	Recombinant DNA II; Polymerase Chain Reaction Watson, Recombinant DNA, chapter 4 (continued)
4) 9/16, W	“	Molecular Cloning (& tips on in-depth paper analysis) Watson, Recombinant DNA, chapter 5 Buck and Axel, Cell 65:175-187, 1991
5) 9/18, F	“	Analysis of Gene Structure & Expression Watson, Recombinant DNA, chapter 5 (continued) Desai et al., Mol Endo 18:2895-2907, 2004
6) 9/21, M	Wilson	DNA Replication and Mutation Pursell et al., Science 317: 127-130, 2007
7) 9/23, W	“	Recombination I: Homologous recombination Szostak et al., Cell 33: 25-35, 1983 Ira et al., Cell 115: 401-411, 2003
8) 9/25, F	“	Recombination II: Illegitimate recombination Boulton et al., EMBO J 15: 5093-103, 1996
<b>---) 9/28, M</b>	<b>EXAM I</b>	
9) 9/30, W	Meisler	Genome 1: Molecular Markers and Genetic Maps Initial sequence of the human genome. Nature 409:862-870 <u>and</u> 906-914, 2001.
10) 10/2, F	“	Genome 2: How the human genome was sequenced. Strachan & Read, 3rd ed. Chapter 8 pp 208-225
11) 10/5, M	“	Genome 3: Annotation of the human genome sequence. Nobrega et al., Science 302:413, 2003 (one page)

- 12) 10/7, W “ Genome 4: Human molecular heterogeneity  
Yang et al, Molecular Psychiatry 8: 706-709, 2003
- 13) 10/9, F “ Genome 5: Positional cloning of human disease genes  
Strachan & Read, 3rd. ed. Chapter 14, pp 416-433.  
Fisher et al., Nature Genetics 18: 168-170, 1998.  
Lai et al., Nature 413:519-522, 2001
- 14) 10/12, M “ Genome 6: Comparative genomics: mouse mutants and gene function  
Pollard et al., Nature 443: 167-168 (2 pages), 2006.
- 15) 10/14, W “ Genome Review
- 16) 10/16, F Robins Gene Expression I: The Transcription Unit and The Promoter  
(background - Watson, Chaps 5, 6, or similar in Lodish or Alberts)  
McKnight & Kingsbury, Science 217: 316-324, 1982
- 16) 10/19, M “ Gene Expression II: Regulated Transcription  
(**NOT Study Break**)  
Benzra et al., Cell 61: 49-59, 1990
- 17) 10/21, W “ Chromatin and Gene Regulation  
Orphanides & Reinberg, Cell 108: 439-451, 2002  
Struhl, Cell 98: 1-4, 1999
- 18) 10/23, F “ Coactivators and Corepressors  
Shiau et al., Cell 95:927-937, 1998
- 19) 10/26, M Chan RNA 5' and 3' End Processing and Coupling to Transcription  
Lodish, section 8.1 on "5' Cap (addition)" pages 325-326 and  
"3' cleavage and polyadenylation" pages 335-336  
Bentley, Curr. Opin. Cell Biol. 17:251-256, 2005
- 20) 10/28, W “ Post-transcriptional Regulation I: Pre-mRNA Splicing  
Lodish, section 8.1 pages 326-335
- 21) 10/30, F “ Post-trx Regulation II: Splicing Regulation and mRNA Export  
Lodish, section 8.3 pages 341-347  
Ule et al., Nature 444:580-586, 2006
- 22) 11/2, M “ Post-trx Regulation III: mRNA Decay and Cytoplasmic Mechanisms  
of Post-transcriptional Control  
Lodish, section 8.4, pages 347-353  
McGlinchey & Smith, Trends Biochem. Sci. 33:385-393
- ) 11/4, W **EXAM II**
- 23) 11/6, F Burke Yeast Genetic Networks I: the GAL Gene System  
Alberts Chap 7, pp. 395-416; Chap 8, pp 525-533

- 24) 11/9, M “ Yeast Genetic Networks II: the MAT Gene System  
Alberts Chap 7, pp. 417-419  
Lodish section 22.2
- 25) 11/11, W “ Drosophila Development I: Hierarchical Organization  
Alberts Chap 21, pp. 1157-1169, 1177-1195  
Lodish section 15.3 and 15.4
- 26) 11/13, F “ Drosophila Development II: Anterior-posterior Regulators  
Alberts Chap 21, pp1157-1169, 1177-1195
- 27) 11/16, M “ Drosophila Dev. III: Homeotic Regulators, Polycomb and Trithorax
- 28) 11/18, W “ Chromatin Level Control I: the Yeast SNF Complex  
Lodish sections 15.3 and 15.4
- 29) 11/20, F “ Chromatin Level Control II: Position Effect Variegation  
Alberts Chap 4, pp 207-233
- 30) 11/23, M “ Chromatin Level Control III: Allele-specific Activation  
Alberts Chap 7, pp 426-435
- 31) 11/25, W “ Chromatin Level Control IV: Mammalian X-inactivation
- ) 11/27, F – Thanksgiving**
- 32) 11/30, M Davis Transgenic Mice  
Slow et al. Human Molecular Genetics 12:1555-1567, 2003
- 33) 12/2, W “ Gene Targeting in ES Cells  
Duyao et al., Science 269: 407-410, 1995
- 34) 12/4, F “ Inducible gene expression  
Muller, Mechanisms of Development 82:3-21,1999
- 35) 12/7, M Moran Transposons and Retrotransposons  
Moran et al., Cell 87, 917-27, 1996
- 36) 12/9, W “ Transposons and Retrotransposons / Cancer Genetics I (Oncogenes)  
Hanahan and Weinberg, Cell 100, 57-70, 2000 (review article)
- 37) 12/11, F “ Cancer Genetics I/II (Oncogenes/Tumor Suppressors)  
Hahn et al., Nature 400: 464-468, 1999
- 38) 12/14, M “ Cancer Genetics II (Tumor Suppressors)

**--) 12/17 Th EXAM III 4 pm – 6 pm**