

BIOSCIENCES 741 - GENOMICS
FALL SEMESTER, 2013

TERM PAPER TOPICS & DEADLINES

Week 4 (September 17) Genetic polymorphisms, population genetics and human genetics

Zheng Zhou's topic - Bentley, D. B. (2003) DNA sequence variation of *Homo sapiens*. *Cold Spring Harbor Symp. Quant. Biol.* **68**, 55-63. (A PDF copy of this article will be posted on the course web site.)

Week 5 (September 24) Gene expression analysis

Scott Dean's topic - Lenhard, B., et al. (2012) Metazoan promoters: emerging characteristics and insights into transcriptional regulation. *Nat Rev Genet* **13**, 233-245.

Week 6 (October 1) Alternative splicing

Kevin Armengol's topic - Davuluri, R. V. et al. (2008) The functional consequences of alternative promoter use in mammalian genomes. *Trends Genet* 167-177.

Week 7 (October 8) Midterm Examination - covers weeks 1-6

Week 8 (October 15) Columbus Day – this week Monday classes meet on Tuesday, and Tuesday classes do not meet!!

Week 9 (October 22) Characterization of the human genome: codon bias, gene density, GC content, recombination, CpG islands (ABSTRACTS of term papers due today)

Week 10 (October 29) Characterization of the human genome: noncoding DNA, transposable elements, *Hox* genes, chromosome rearrangements and gene families

Ryan Blower's topic - Levin, H. L. and Moran, J. V. (2011) Dynamic interactions between transposable elements and their hosts. *Nat Rev Genet* **12**, 615-627.

Week 11 (November 5) Proteomics, functional genomics, and systems biology

Rosa Gallagher's topic - Maarten Altelaar, A. F. et al. (2013) Next-generation proteomics: towards an integrative view of proteome dynamics. *Nat Rev Genet* **14**, 35-48.

Week 12 (November 12) class does not meet (Society for Neuroscience meetings in San Diego)

Week 13 (November 19) Epigenetics – DNA methylation

Ezzat Dadkhah's topic - Jones, P. A. (2012) Functions of DNA methylation: islands, start sites, gene bodies and beyond. *Nat Rev Genet* **13**, 484-492.

Alexandra Hudson's topic - Smith, Z. D. and Meissner, A. (2013) DNA methylation: roles in mammalian development. *Nat Rev Genet* **14**, 204-220.

Atit Patel's topic - Branco, M. R. et al. (2012) Uncovering the role of 5-hydroxymethyl cytosine in the epigenome. *Nat Rev Genet* **13**, 7-13.

Week 14 (November 26) Epigenetics - histone modifications.

Kianoush Jeiran's topic - Greer, E. L. and Shi, Y. (2012) Histone methylation: a dynamic mark in health, disease and inheritance. *Nat Rev Genet* **13**, 343-357.

Week 15 (December 3) Microbial genomes. **Term papers due today! Late penalty is 10% per day!**

Ekaterina Marakosova's topic - Wang, X. et al. (2013) Organization and segregation of bacterial chromosomes. *Nat Rev Genet* **14**, 191-203.

Maria Keaton's topic - Jackson, R. W. et al. (2011) Bacterial pathogen evolution: breaking news. *Trends Genet* **27**, 32-40.

December 10 - Final Exam - 4:30 pm to 7:15 pm. Covers weeks 9-15.