

The course will meet Tuesdays & Thursdays 12:00 – 1:20 PM in BSLC 240.

The weekly format will be an introductory lecture on the topic of the paper to be discussed followed by a detailed analysis of the research presented in that particular paper. Students should read the week’s paper before the Tuesday meeting to begin thinking about the subject under consideration. Lecture notes will be posted on the Chalk web site (<https://chalk.uchicago.edu>). It is recommended that students print them out and use the hard copy for taking notes during the lectures.

WEEK DATE TOPIC

1 Mar 30, Apr 1 The basics of protein-DNA interactions and transcriptional regulation

Muller J, Oehler S, Muller-Hill B. Repression of lac promoter as a function of distance, phase and quality of an auxiliary lac operator. *J Mol Biol.* 1996 Mar 22;257(1):21-9.

2 Apr 6, 8 Methylation control in bacteria

Han N Lim & Alexander van Oudenaarden. 2007. A multistep epigenetic switch enables the stable inheritance of DNA methylation states. *Nature Genetics* 39:269.

April 11 **Outline for paper #1**

3 Apr 13, 15 Developmental regulation - promoter-enhancer regions

Yuh CH, Bolouri H, Davidson EH. Genomic cis-regulatory logic: experimental and computational analysis of a sea urchin gene. *Science.* 1998 Mar 20;279(5358):1896-902.

Apr 18 **Paper 1 due**

- 4** Apr 20, 22 **siRNA, heterochromatin and centromere function**
Hall IM, Noma K, Grewal SI. RNA interference machinery regulates chromosome dynamics during mitosis and meiosis in fission yeast. Proc Natl Acad Sci U S A. 2003 Jan 7;100(1):193-8.
- 5** Apr 27, 29 **Regulation and compartmentalization of retrotransposons in *S. pombe***
Cam, H. P. et al. Host genome surveillance for retrotransposons by transposon-derived proteins. Nature 19 December 2007 (doi: 10.1038/nature06499)
- 6** May 4, 6 **Transposable elements and epigenetic regulation**
Lippman Z, Gendrel AV, Black M, Vaughn MW, Dedhia N, McCombie WR, Lavine K, Mittal V, May B, Kasschau KD, Carrington JC, Doerge RW, Colot V, Martienssen R. Role of transposable elements in heterochromatin and epigenetic control. Nature. 2004 Jul 22;430(6998):471-6.
May 7 **Article for paper #2 approved**
- 7** May 11, 13 **Imprinting and epigenetic inheritance**
Kinoshita Y, Saze H, Kinoshita T, Miura A, Soppe WJ, Koornneef M, Kakutani T. Control of FWA gene silencing in Arabidopsis thaliana by SINE-related direct repeats. Plant J. 2007 Jan;49(1):38-45.
- 8** May 18, 20 GERASIMOVA, T. I., K. BYRD and V. G. CORCES, 2000 A chromatin insulator determines the nuclear localization of DNA. Mol. Cell **6**: 1025–1035.
May 19 **Outline for paper #2**

- 9** May 25, 27 **Dosage compensation – counting X chromosomes**
Lee J. 2005. Regulation of X-Chromosome Counting by Tsix and Xite Sequences.
SCIENCE 309: 768-771.
- Na Xu, Chia-Lun Tsai, Jeannie T. Lee. 2006. Transient Homologous Chromosome
Pairing Marks the Onset of X Inactivation. *Science* 24 February 2006:_Vol. 311. no.
5764, pp. 1149 – 1152.
- 10** June 1
June 3 **READING PERIOD – PAPER 2 DUE**