

7.342 How to Build an Animal: Cell Fate and Identity in Development and Disease
Week Three

Silva et al, 2009

Terms and concepts of note:

- Pluripotent ground state
- ES cells vs. iPS cells, vs. epiSCs, vs. epi-iPS cells
- Partial reprogramming
- X chromosome inactivation and reactivation in development

Ang et al, 2011

Terms and concepts of note:

- The Polycomb complex
- The Trithorax complex
- Protein occupancy at gene promoters
- short hairpin RNA (shRNA) knockdowns
- Flag and Myc epitope tags

Looking Ahead:

Bernstein et al, 2006: A Bivalent Chromatin Structure Marks Key Developmental Genes in Embryonic Stem Cells

- What is the biological significance of highly conserved noncoding elements (HCNEs)?
- What is the proposed purpose for bivalent domains in ES cells?
- How does sequential CHIP work?
- What is the biological significance of transposon exclusion zones?

Lesch et al, 2013: Parallel evolution of male germline epigenetic poisoning and somatic development in animals

- Why does the analysis include five mammals and one avian species? (i.e., what purpose does the avian species serve?)
- How do the cell types studied in Lesch et al compare with those studied in previous papers?
- How is the 'core' set of poised genes determined?
- How do poised genes in the 'core' set differ biologically from poised genes not in the 'core' set?

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