

Somatic Cell Genealogies and Differentiation

17.2.09

Objective: To give a presentation of about 60 minutes at the end of the week covering the key aspects of integrative genomics, which is the combined analysis of data from multiple sources/levels.

The questions and contents below are meant as motivators and need not be followed. Since we give several lectures on IG, you should probably try to give a new angle in the presentation or focus on a few new and exciting publications.

The Big Questions:

Recommended literature is only meant to get you started. You might very well be able to find papers more suited for your purpose.

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- Frumkin et al (2005) "Genomic Variability within an Organism Exposes Its Cell Lineage Tree." *PLoS Comput Biol.* Oct;1(5):e50.
- Dan Frumkin, Adam Wasserstrom, Shalev Itzkovitz, Tomer Stern, Alon Harmelin, Raya Eilam, Gideon Rechavi, and Ehud Shapiro. Cell Lineage Analysis of a Mouse Tumor. *Cancer Res.* 68(14):5924-5931, 2008.
- Khanna VK (2006) "Existing and emerging technologies for DNA finger printing, sequencing, bio- and analytical chips: A multidisciplinary approach unifying molecular biology, chemical and electrical engineering" *Biotech. Adv.* 25:85-98.
- Kim JY, Tavaré S, Shibata D. "Human hair genealogies and stem cell latency." *BMC Biol.* 2006 Feb 3;4:2.
- Kim JY, Tavaré S, Shibata D. "Counting human somatic cell replications: methylation mirrors endometrial stem cell divisions." *Proc Natl Acad Sci U S A.* 2005 Dec 6;102(49):17739-44.
- Ro, S. and B.Rannala (2001) "Methylation patterns and mathematical models reveal dynamics cell turnover in the human colon" *Proc.Natl.Acad.Sci.*98.10519-21.
- Shibata D, Tavaré S. "Counting divisions in a human somatic cell tree: how, what and why?" *Cell Cycle.* 2006 Mar;5(6):610-4.
- Wasserstrom et al. (2008) "Reconstruction of Cell Lineage Trees in Mice" *PLOS Biology* 3.4:e1939-
- Watase K, Venken KJ, Sun Y, Orr HT, Zoghbi HY. Regional differences of somatic CAG repeat instability do not account for selective neuronal vulnerability in a knock-in mouse model of SCA1. *Hum Mol Genet.* 2003 Nov 1;12(21):2789-95J.
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- Eldad Tzahor, Eran Segal, and Ehud Shapiro. Reconstruction of cell lineage trees in mice. *PLoS ONE*, 3(4):e1939, 04 2008.
- Darryl Shibata and Simon Tavaré. Stem Cell Chronicles: Auto-biographies Within Genomes. *Stem Cell Rev* (2007) 3:94-103.
- Darryl Shibata. Stem cells as common ancestors in a colorectal cancer ancestral tree. *Current opinion in Gastroenterology.*24:59-63, 2008.
- Bernards R, Weinber RA. A progression puzzle. *Nature* 2002;418:823.
- Nowell PC. clonal evolution of tumor cell populations. *Science* 1976;194:23-8.