

Readings for Module 1: Introduction to arrays

Basic descriptive papers and documentation:

- Eisen M.B. and Brown P.O. (1999). DNA microarrays for analysis of gene expression. *Methods Enzymology* 303, 179-205 (description of spotted arrays).
- Lipshutz R.J., Fodor S.P.A., Gingeras T.R., Lockhart D.J. (1999). High density synthetic oligonucleotide arrays. *Nature Genetics* supplement, 21, 20-24 (description of affymetrix arrays).
- Affymetrix, Microarray Suite version 5.0 (2002). *Statistical Algorithms Reference Guide* (single array analysis). More in: *Statistical Algorithms Description Document* (available at various sites, http://icg.cpmc.columbia.edu/Bioinformatics/MAS_5.pdf)

Some manuscripts from Magnasco's lab (Rockefeller University) on the role and dangers of mismatches in Affymetrix chips:

- Naef F. Lim D.A., Patil N., Magnasco M. (2001). From features to expression: High-density oligonucleotide array analysis revisited.
- Naef F. Lim D.A., Patil N., Magnasco M. (2002). DNA hybridization to mismatched templates: a chip study. *Physical Review E* 65(4), 040902.
- Naef F., Magnasco M. (2002). Solving the riddle of bright mismatches: hybridization in oligonucleotide arrays.
- Naef F., Socci N.D., Magnasco M. (2002). A study of accuracy and precision in oligonucleotide arrays: extracting more signal at large concentrations.

Some papers on replication:

- Lee M.L., Cuo F.C., Whitmore G.A., Sklar J. (2000). Importance of replication in microarray gene expression studies: statistical methods and evidence from repetitive cDNA hybridizations. *PNAS*, 97,18, 9834-9839.
- Pan W., Lin J., Le C. (2002). How many replicates of arrays are required to detect gene expression changes in microarray experiments? A mixture model approach. *Genome Biol.* 3(5). U. of MN tech report: <http://www.biostat.umn.edu/~weip/ge.html>.
- Zien, Fluck, Lengauer (2003). Microarrays: How many do you need? *Journal of Computational Biology* 10(3/4), 653-667. Preprint: <http://cartan.gmd.de/~zien/publications.html>

See also:

- Tran P.H., Pfeiffer D.A., Shin Y. Meek L.M., Brody J.P., Cho K.W.Y. (2002). Microarray optimization: increasing spot accuracy and automated identification of true microarray signals. *Nucleic Acids Research*, 30, 12.