

Some comments about Biology 102

1. The text is *Human Molecular Genetics*, 3rd edition, by Strachan and Read (ISBN 0-8153-4182-2).
2. Class meets in block E, Monday and Wednesday, 10:30 – 11:45.
3. In addition to readings in the book listed above, there will be many readings of original papers and review articles. At first, you may find it difficult to read an original paper, but the ability develops with practice and it is one of the most important things to be learned in this course. When reading a research paper, read each word. Look at each table and figure and ask yourself: Why did they do this, how did they get these results, and what do the results tell the reader?
4. As most online journals are by subscription, you will need to get access via Tisch's website. On the Tisch Library's website go to electronic journals. If you have difficulty finding an article online, ask for help at the reference desk at Tisch Library.
5. Papers available online can be printed. When printing out a paper, be sure that you print the figures and tables in a large enough format.
6. All tests are open book. Any books, notes, and papers can be used during a test. Tests from 2008 are posted on the Biology 102 Blackboard site.
7. The course will have four open book tests (no comprehensive final) scheduled on:

Test 1	October 7	80 points
Test 2	November 2	90 points
Test 3	November 23	90 points
Test 4	December 16 (3:30)	110 points

SCHEDULE

BIOLOGY 102

HUMAN GENETICS

FALL 2009

September	9, 14, 16	Methods
September	21, 23	Human genome organization
September	28	No Class
September	30	LOD and mapping
October	5	LOD and mapping
October	7	TEST 1
October	13, 14	Genome wide association studies
October	19, 21, 26	Cancer
October	28	Stem cells
November	2	TEST 2
November	4, 9, 11	Stem cells
November	16, 18	Gene therapy
November	23	TEST 3
November	25, 30	Multifactorial traits and behavior
December	2, 7	Multifactorial traits and behavior
December	9	Genetic variation and screening
December	16 (3:30pm)	TEST 4

ASSIGNMENTS

Biology 102

Human Genetics

Fall 2009

4.1 = Chapter 4, section 4.1 of *Human Molecular Genetics*, 3rd ed. by Tom Strachan and Andrew P. Read.

e = entire

I. Methods

Cloning 5.1(e), 5.3(e)
Hybridization assays 6.2(e), 6.3.2, 6.3.4, 6.4(e)
PCR 5.2(e)

II. Human genome organization

9.1.1, 9.1.3, 9.3.1, 9.4.1, 9.4.2, 9.4.3, 9.5.1-9.5.3

III. LOD and mapping

13.2-13.5(e)

Howe, R.R. *et al.* (2001) Germline mutations of the gene encoding bone morphogenetic protein receptor IA in juvenile polyposis. *Nature Genet.* 28: 184.
Vervoort, V.S. *et al.* (2002) AGTR2 mutations in X-linked....*Science* 296: 2401.
Mani, A. *et al.* (2002) Finding genetic contributions to sporadic disease....*Proc. Natl. Acad. Sci.* 99: 15054.
Darvasi, A. and Shifman, S. (2005) The beauty of admixture. *Nature Genetics* 37: 118.

IV. Genome wide associate studies

Bowcock, A.M. (2007) Guilt by association. *Nature* 447: 645.
Hardy, J. and Singleton, A. (2009) Current concepts: genome wide association studies and human disease. *New Eng. J. Med.* 360: 1759.

V. Cancer

Chap. 17(e)
Kim, N.W. *et al.* (1994) Specific association of human telomerase with immortal cells and cancer. *Science* 266:1959.
Buys, C.H.C.M. (2000) Telomeres, telomerase, and cancer. *New Eng. J. Med.* 342:1282.

Weitzman, J.B. and Yaniv, M. (1999) Rebuilding the road to cancer. *Nature* 400:401
Golub, T.R. (2001) Genome-wide views of cancer. *New Eng. J. Med.* 344:601.
Goldman, J.M. and Melo, J.W. (2001) Targeting the Bcr-Abl tyrosine kinase....*New Eng. J. Med.* 344:1084.
Traverso, G. *et al* (2002) Detection of APC mutations in fecal DNA...*New Eng. J. Med.* 346:311.

VI. Stem cells

3.4.3-3.4.6

Thompson, J.A. *et al.* (1998) Embryonic stem cells derived from human blastocysts. *Science* 282: 1145.
Marris, E. (2004) IVF embryos meet contrasting fates (<http://nature.com/news/2004/040823/full/040823-15.html>)
Cowan, C.A. *et al.* (2004) Derivation of embryonic stem-cell lines *New Eng. J. Med.* 350: 1353.
Gearhart, J. (2004) New human embryonic stem-cell lines....*New Eng. J. Med.* 350: 1275.
Yu, J. *et al.* (2007) Induced pluripotent stem cell lines derived.....*Science* 318:1917.
Hanna, J. *et al.* (2007) Treatment of sickle cell anemia mouse model.....*Science* 318:1920.
Pera, M. F. (2009) Low-risk reprogramming. *Nature* 458: 715.
Baker, M. (2009) Fast and furious. *Nature* 458: 962.
Cyranoski, D. (2009) Mice made from induced stem cells. *Nature* 460: 560.

VII. Gene therapy

21.3.3, 21.4, 21.5 (e), 21.7 (e)

Rosen, F. S. (2002) Successful gene therapy for severe combined immunodeficiency. *New Eng. J. Med.* 346: 1241.
Hacein-Bey-Albina, S. *et al.* (2003) A serious adverse event after successful gene therapy...*New Eng. J. Med.* 348: 255.
Wenner, M. (2009) Tribulations of a trial. *Sci. American*, Sept. 2009, p. 14.
Maguire, A.M. *et al.* (2008) Safety and efficacy of gene transfer for Leber's congenital amaurosis. *New Eng. J. Med.* 358: 2240.

VIII. Multifactorial characters and behavior

4.4(e), 15.1(e), 15.6.1, 15.6.2, 15.6.3, 15.6.6, 15.6.7, 15.7(e)

Brunner, H.G. (1993) Abnormal behavior associated with a point mutation...*Science* 262:578
Cases, O. *et al.* (1995) Aggressive behavior and altered amounts of brain serotonin....*Science* 268:1763

Stokstad, E. (2002) Violent effects of abuse tied to gene. *Science* 297: 752.
Caspi, A. *et al.* (2002) Role of the genotype in the cycle of violence.... *Science* 297: 851.
McGue, M. (1989) Nature-nuture and intelligence. *Nature* 340:552
Capron, C. and Duyme, A. (1989) Assessments of socio-economic status....*Nature* 340:552
Zielinska, E. (2007) Copy number linked to autism (<http://www.the-scientist.com/news/display/52940/>)
Walsh, T. *et al.* (2008) Rare structural variants disrupt multiple genes in neurodevelopmental....*Science* 320:539.

IX. Genetic variation and screening

18.1(e), 18.2(e), 18.3.1-18.3.5, 18.4, 18.4.1, 18.4.2, 18.7(e)
Lander, E.S. and Ellis, S. (1998) Founding father. *Nature* 396:13
Foster, E.A. *et al.* (1998) Jefferson fathered slave's last child. *Nature* 396:27
Parra, F.C. *et al.* (2003) Color and genomic ancestry in Brazilians. *Proc. Natl. Acad. Sci.* 100: 177.
Drayna, D. (2005) Founder mutations. *Scientific American*, October 2005.