Textbook Icon References

CHAPTER 1: CELLS AND TISSUES

Page 7: In Depth 1.1 For more information about green fluorescent protein and other genetically encoded fluorescent molecules see Tsien, R. Y. (2005) Building and breeding molecules to spy on cells and tumors. *FEBS Letters* 579 927-932 and Zimmer, M. (2005) *Glowing genes: A Revolution in Biotechnology*. Prometheus Books, ISBN-13: 978-1591022534

Page 14: Answer to thought question: Malformation of the endoplasmic reticulum and Golgi apparatus is thought to underlie one type of inherited spastic paraplegia – for more information, see Rismanchi *et al.* (2008) *Hum Mol Genet* 17 p.1591.

CHAPTER 3: MEMBRANES AND ORGANELLES

Page 43: In the second edition we gave the thickness of the lipid bilayer as between 5 and 10 nm. However estimates of biological membrane thickness have been declining over the years. Mitra *et al.* 2004 (PNAS 101 p4083) measured the thickness of endoplasmic reticulum, Golgi, basolateral and apical plasma membranes of rat hepatocytes as, respectively, 3.85 ± 0.04 µm, 3.95 ± 0.04 µm, 3.56 ± 0.06 µm, and 4.25 ± 0.03 µm, so in this edition we state the typical thickness as 4 nm.

Page 46: Our statements on the compatibility of different connexin isoforms are based on these papers: Elfgang, *et al.*, *J Cell Biol*, (1995) 129: p. 805; Tomasetto *et al*. *J Cell Biol*, (1993) 122: p. 157; Gemel *et al. J Cell Sci*, (2004) 117: p. 2469; Barrio *et al.* (1991) *PNAS* 88, 8410; Bukauskas *et al.* (1995)

Pflugers Arch. 429, p. 870; Swenson *et al.* (1989). *Cell* 57, p145 and Werner *et al.* (1989) *PNAS* 86, p. 5380.

💻 CHAPTER 4: DNA STRUCTURE AND THE GENETIC CODE

Page 60: Medical Relevance 4.2: For more information on Hurler / Scheie syndrome, see Hein *et al.* (2004) *J. Mol. Biol.* 338 p453; Scott *et al.* (1992) Human Mutation 1 p. 333; Scott *et al.* (1995) *Human Mutation* 6 p.288 and Murphy *et al.* (2009) *Archives of Disease in Childhood* 94 p.52.

Page 63: Medical Relevance 4.3: For a description of the different mutations in the FMO3 gene found in different families, see Treacy *et al.* (1998) *Human Molecular Genetics* 7 p.839.

Page 64: It is in various ciliates that we find UAA and UAG coding for glutamine rather than *stop*. For more information, see Sánchez-Silva *et al.* (2003), *Current Biology* 13 p.442.

💻 CHAPTER 5: DNA AS A DATA STORAGE MEDIUM

Page 77: In Depth 5.2 BLASTN and BLASTP are some of the many tools provided by the US National Center for Biotechnology Information. This link goes directly to go direct to the BLAST tools.

💻 CHAPTER 6: TRANSCRIPTION AND THE CONTROL OF GENE EXPRESSION

Page 89: Example 6.1: See the video "Quorum Sensing in Bacteria" and read Hastings, J. W., and Greenberg, E. P. (1999) *J. Bacteriol*. 181: 2667-2668.

Page 94: In Depth 6.1: Our discussion of microRNA 34a is based on Bommer *et al.* (2007) *Curr Biol* 17 p1298; Chang *et al.* (2007) *Mol Cell* 26 p.745 and Tazawa *et al.*. (2007) *PNAS* 104 p.15472.

Page 95: Medical Relevance 6.1: For more information on hyperforin's action see Moore *et al.* (2000) *Proc Natl Acad Sci USA* 13 p.7500.

Page 96: Medical Relevance 6.2: This box is based on Mick *et al.* (2001) *Molecular Endocrinology* 15 p. 575. It is surprising to find aldosterone, a mineralocorticoid, acting through the gluococorticoid receptor but the evidence presented is strong.

💻 CHAPTER 7: RECOMBINANT DNA AND GENETIC ENGINEERING

Page 113: Medical Relevance 7.1: See the video "DNA microarrays" and read Stoughton (2002) *Scientific American* 286 p.44.

Page 117: In Depth 7.1: The molecular genetics of golden rice is described in Beyer *et al.* (2002) *J. Nutrition* 132 p.506S-510S. See also the involvement of the Rockefeller Foundation.

💻 CHAPTER 8: MANUFACTURING PROTEIN

Page 128: Example 8.1: For more on formyl methionine and the immune system see *Web Text Box 8.1: More on the irritating formyl methionine: why doesn't our immune system attack mitochondria?*

The discovery of cells in the nose that respond to N-formyl methionine peptides is described in Riviere *et al.* (2009) *Nature* 459 p. 574.

Page 131: Medical Relevance 8.1: For more on this topic see Hein *et al.* (2004) *J Mol. Biol.* 338 p. 453 and Brooks *et al.* (2006) *Trends in Mol. Med.* 12 p. 367.

Page 133: For a short review on the proteasome with special emphasis on antigen processing and the major histocompatibility complex protein see Kloetzel (2004) *Biochimica et Biophysica Acta (BBA) - Molecular Cell Research* 1695 p. 225.

Well formed, barrel shaped proteasomes are characteristic of eukaryotic cells. Proteasomes are found in bacteria (e.g. Sharon *et al.* (2007) *Journal of Biological Chemistry* 282 p.18448) but in most bacteria the components are not so obviously organized into a discrete barrel-shaped machine.

💻 CHAPTER 9: PROTEIN STRUCTURE

Page 141: Example 9.1: The medical name for the disease caused by failure of ROMK is Bartter's syndrome type II. Our discussion of how the salt bridges are necessary to keep the pore in ROMK patent is based on Leng *et al.* (2006) PNAS 103 p.1982.

Page 149: For a review on NFAT, including a discussion of its origin, see Crabtree (2002) *Cell* 109 p. S67. A detailed primary paper on the origin of NFAT and related proteins is Graef *et al.* (2001) *PNAS* 98 p. 5740.

Page 153: Medical Relevance 9.2: See the iBioSeminar by Susan Lindquist. The structure of the prion protein is described in Moore *et al.* (2009) *Curr Opin Struct Biol.* 19: p.14.

Discussion of the farming practices that led to the disease outbreak is based on Bradley *et al.* (2006) Folia Neuropathol. 44 p.93 and p.102.

This is also the source of vCJD deaths up to 2005 inclusive. Here are data on later years.

💻 CHAPTER 10: INTRACELLULAR PROTEIN TRAFFICKING

Page 166: In Depth 10.1: To see trafficking movies, we recommend Part 1 of Jennifer Lippincott-Schwartz' online seminar "Breakthroughs in Intracellular Fluorescent Imaging" at iBioSeminars.

Other sites to look at are:
http://mcbi.ouhsc.edu/clarkelab/movies_bead_uptake.html
http://www.nimr.mrc.ac.uk/research/tom-carter/movie-gallery
http://vimeo.com/887388>

Page 176: For more on Arf see *Web Text Box 10.1, Arf's sticky finger*.

💻 CHAPTER 11: HOW PROTEINS WORK

Page 182: For more on how proteins operate as catalysts, see *Web Text Box 11.1, Enzyme catalytic strategies.*

Page 184: For more on cytochromes and their different colors, see *Web Text Box 11.3, A cytochrome ABC.*

Page 187: Medical Relevance 11.3: For more on how we study the effect of drugs on enzymes, see *Web Text Box 11.2, Analyzing enzyme kinetics: finding out how drugs work*

💻 CHAPTER 12: ENERGY TRADING WITHIN THE CELL

Page 194: Medical Relevance 12.2: Information on the genes within the mitochondrial genome is from da Fonseca *et al.* (2008) *BMC Genomics* 9 p.119. For more on the hypothesis that neurodegenerative diseases can have a mitochondrial origin see Krishnan *et al.* (2007) *Biochemical Society Transactions* 35 p.1232; Kyriakouli *et al.* (2008) *Gene Therapy* 15 p.1017 and Sciacco *et al.* (1994) *Human Molecular Genetics* 3 p.13.

Page 196: For more on cytochromes, see *Web Text Box 11.3, A cytochrome ABC.*

Page 196: For a listing of the names used for various members of the electron transport chain, see *Web Text Box 12.2, Alternative names for components of the electron transport chain.*

Page 201: In Depth 12.2: See animation of ATP synthase's operation that includes laboratory data showing rotation of a fluorescent tag attached to the rotor.

💻 CHAPTER 13: METABOLISM

Page 216: Example 13.2: For more on Ackee fruit, see Joskow *et al.* (2006) *Clinical Toxicology* 44 p.267.

💻 CHAPTER 14: IONS AND VOLTAGES

Page 231: The statements we make here concerning the resting voltage of glial cells remain the dogma, although the truth is no doubt more complicated. If the membrane of a cell is permeable only to potassium, then if the extracellular

potassium concentration is changed the membrane voltage will change such that V_m is proportional to (RT/F) $\log_e$ [K] (see In Depth 14.2). We call such behaviour “Nernstian”. Kuffler (1967, *Proc Roy Soc* B 168 p.1) shows in Figure 8 salamander optic nerve glia with a resting voltage of -89 mV and a perfect potassium Nernstian slope. For an example of a recent paper in which the glia show a highly Nernstian behaviour with $V_m \sim E_K$, see Tritsch *et al.* (2007) *Nature* 450 p.50.

Page 242: Example 14.4: Our discussion of the pharmacology of Szechuan peppers is taken from Bautista *et al.* (2008) *Nature Neuroscience* 11 p.772.

Page 247: Medical Relevance 14.3: For more on the kidney see Brenner and Rector’s *The Kidney*, 7th edition (2004), ISBN 0-7216-0164-2.

There are in fact two isoforms of the sodium, glucose cotransporter. Initial uptake of glucose is by SGLT2 with a stoichiometry of one glucose molecule for each one sodium ion. More distally, cells express SGLT1, with a stoichiometry of 2 Na^+ to 1 glucose, to take up glucose against a greater concentration gradient. We state that cytosolic glucose is about 40 mM in kidney cells.

We know of no measurements of this, and make an estimate of 40 mM by analogy with intestinal uptake which uses the same carrier systems and where measurements of cellular glucose (which will have been contaminated with extracellular fluid) gave a value of 36 mM (Leese (1974) *Nature* 251 p.512). We are very grateful to David Bender, Ted Debnam and Robert Unwin of University College London for their helpful input on this question.

The value of ENaC open probability is from Becchetti *et al.*(2002) *Am. J. Physiol* 283 page F1030 while membrane voltage values are from Shimizu *et al.* (1993) *J. Physiol* 462 p. 275.

Data on how ROMK responds to acidification are from Wang *et al.* (1990) *Am. J. Physiol.* 259 page F494 and Chancevalap *et al.* (2000) *J. Biol. Chem.* 275 p.7811.

💻 CHAPTER 15: INTRACELLULAR SIGNALING

Page 260: The mechanism by which PDGF activates its receptor is described in Chiara *et al.* (2004) *Journal of Biological Chemistry* 279 p. 19732. The best studied receptor tyrosine kinase is the epidermal growth factor receptor, where the mechanism of activation is somewhat different – see Zhang *et al.*(2006) *Cell* 125 p.1137.

Page 261: For more on Grb2's requirement for an asparagine two amino acids away from the phosphotyrosine see Arvidsson *et al.* (1994) *Mol. Cell Biol.* 14 p. 6715; Songyang *et al.* (1993) *Cell* 72 p.767 and Wavreille *et al.* (2007) *Methods* 42 p.207.

💻 CHAPTER 16: INTERCELLULAR COMMUNICATION

Page 277: For a review on the control of muscle blood supply, see Clifford and Hellsten (2004) *J. Applied Physiology* 97 p. 393. For details on the current knowledge of the stretch activated channels see Sokabe *et al.* (1997) *Heart Vessels Supplement* 12 p.191; Brakemeier *et al.* (2002) *Cardiovascular Research* 2002 53 p.209; Takeda *et al.* (2006) *Life Sciences* 79 p.233 and Folgering *et al.* (2008) *Prog Biophys Mol Biol* 97 p.180.

Page 279: For more on MyoD see Berkes and Tapscott (2005) *Semin Cell Dev Biol* 16, p.585; Thayer *et al.* (1989) *Cell* 58 p.241; Tapscott (2005) *Development* 132 p.2685 and Chargé *et al.* (2008) *BMC Dev Biol* 8, p.5.

Page 279: For more on numb in the retina see Cayouette *et al.* (2001) *J. Neurosci.* 21, 5643-51 and Cayouette and Raff (2003) *Development* 130, 2329-39.

Page 280: For more on agrin see Sanes and Lichtman (1999) *Annual Reviews of Neuroscience* 22 p.389; Witzemann (2006) *Cell Tissue Res* 326, 263-71 (2006) and Lee *et al.* (2008) *Neuroscience* 153 p.997.

💻 CHAPTER 17: MECHANICAL MOLECULES

Page 291: Medical Relevance 17.1: For more detail on Listeria and its use of the host cell's actin see *Web Text Box 17.2, How Listeria uses actin polymerization to pass between host cells.*

Page 291: For more on the lamin intermediate filaments and how mutations in lamins cause premature aging, see *Web Text Box 17.5, Lamins, disease and aging.*

Page 292: Answer to thought question: For more on this topic see Brembeck, Rosario and Birchmeier (2006) *Curr Opin Genet Dev* 16 p.51.

💻 CHAPTER 18: CELL CYCLE AND THE CONTROL OF CELL NUMBER

Page 298: For more on the replication of the centrosome see *Web Text Box 18.1, Poles apart: centrosome duplication through the cell cycle.*

Page 305: Medical Relevance 18.2: For more on cousin marriage in the Pakistani immigrant population in Britain see Gadher, Morgan and Oliver, *Sunday Times*, February 10th 2008 and Paul and Spencer (2008) *PLoS Biology* 6 (12) e320. We calculate the eightfold value from the statement in the PLoS article "data from the English West Midlands suggest that British Pakistanis account for only ~4.1% of births, but about 33% of the autosomal recessive metabolic errors recorded at birth". Thus in 100 births in the general population there are N cases, in 4.1 births in the Pakistani population there are N/3 cases, therefore in 100 births in the Pakistani population there are (100/4.1) x (N/3) = 8N cases.

Page 305: A critical experiment in the discovery of the cyclinB/CDK1 system is described in *Web Text Box 18.2, A factor in dividing cells triggers mitosis in interphase cells.*

Page 306: For more on ATM, see *Web Text Box 18.3, What is Ataxia Telangiectasia?*

Page 306: For more on contact inhibition, see *Web Text Box 18.4, Control of cell number: why are we bigger than a mouse and smaller than an elephant?*

Page 306: For more on how p53 upregulates microRNAs that act to reduce the expression of CDK4 and Cdc25 see Bommer *et al.* (2007) *Curr Biol* 17 p.1298; Chang *et al.* (2007) *Mol Cell* 26 p.745 and Tazawa *et al.* (2007) PNAS 104 p. 15472.

Page 307: For more on the spindle assembly checkpoint see Musacchio & Salmon (2007) *Nat Rev Mol Cell Biol*, 8 p.379 and Yu (2007) *Mol Cell* 27 p.3.

Page 308: For more on p53, see *Web Text Box 18.5, p53: all that stands between us and cancer?* One paper that describes how loss of even one functional p53 gene results in a large reduction of p53 protein synthesis is Lynch and Milner (2008) *Oncogene* 25 p.3463. Remarkably, loss of one copy of the gene reduces p53 expression to 25% of normal.

Page 311: For more on protein kinase B and cytochrome c release see Datta *et al.* (1997) *Cell* 91, 231-241; Brunelle and Letai (2009) *J Cell Sci*, 122: p.437; Nechushtan *et al.* (199) *EMBO J*, 18: p.2330; Parikh *et al.* (2004) *J Immunol* 173: p.6220; Sadidi *et al.* (2009) *Biochimie*, 91: p.577 and Yamaguchi and Wang (2001) Oncogene 20: p.7779.

💻 CHAPTER 19: THE CELL BIOLOGY OF THE IMMUNE SYSTEM

Page 320: The lecture in which Frank Burnet proposed the clonal selection theory of acquired immunity is published in *The Abraham Flexner lectures of Vanderbilt University*, Cambridge University Press, 1959.

Page 325: Medical Relevance 19.1: For more on monoclonal antibodies, see Web Text Box 19.2, Making monoclonal antibodies.

Page 325: Answer to thought question: For more on the multiple tricks used by viruses to evade the immune system see Loch and Tampé (2005) *Pflügers Archiv* 451 p. 409.

💻 CHAPTER 20: CASE STUDY: CYSTIC FIBROSIS

Page 330: The values of sweat gland voltage are from Reddy and Quinton (1989) *American Journal of Physiology* 257 p. C722. Values in earlier editions of our book were incorrect.

Page 334: For more on preimplantation diagnosis and antenatal screening see Goossens *et al.* (2009) *Human Reproduction* 24 p.1786 and Cunningham and Marshall (1998) *Arch Dis Child* 78 p.345.

Page 334: Answer to thought question: The hypothesis that an abnormal pH in the Golgi lumen impairs the glycosylation of mucus proteins was proposed in Barasch *et al.* (1991) *Nature* 352 p.70.

💻 GLOSSARY Links

Page 346: For more on ATM, see *Web Text Box 18.3, What is Ataxia Telangiectasia?*

Page 346: For opposing views on the use of the terms of basement membrane and basal lamina see Kefalides and Borel (2005) Basement membranes: *Cell and molecular biology*, pub. Elsevier ISBN 13: 978-0-12-153356-4 and Sanes (2003) *Journal of Biological Chemistry* 278 p.12601.