opposite end of the psychological spectrum, the authors advise: "If your level of harm avoidance is paralyzing…you may want to seek professional help." Deepak Chopra—beware! Of course, it would be difficult for any book dealing with the nature–nurture debate to avoid the occasional cliché, but that hardly justifies inclusion of slipshod slogans such as "Genes don't make criminals—neither does 'gangsta' rap".

Living with our Genes closes with a gratuitous fictional scenario that exploits two of last year's major releases in genetics—Dolly the sheep, and *GATTACA* the movie. It is early in the next century and the first cloned human being has become a leading critic of genetic technology. However, when his wife becomes pregnant, he agrees to have the fetus screened for mental retardation but not for artistic attributes such as musical ability or the latest fad in custom personalities…insouciance! This fanciful image—bereft of scientific or ethical discussion—of a society in which tinkering with human temperament is routine, serves no purpose in a book that merely underscores our inchoate understanding of genes and human behavior.

Ubiquitin and the Biology of the Cell

Edited by Jan-Michael Peters, J. Robin Harris & Daniel Finley

Plenum Publishing Corporation, $115, 494 pp.
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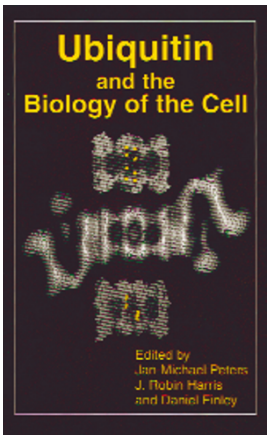
Ubiquitin and the Biology of the Cell, as the editors note, is published 10 years after the first book on ubiquitin appeared and 23 years after the first biochemical description of this ubiquitous molecule. The publication of such an in-depth review reflects the burgeoning popularity of the field, which has grown from a relative backwater of biochemistry to become one of the most central and important areas in cell biology and signal transduction.

Ubiquitin is a 76-amino-acid protein that is chemically unreactive. In eukaryotic cells, a ubiquitin conjugation cascade pathway exists to enzymatically activate ubiquitin, which then becomes covalently attached to substrate proteins that are destined for proteolysis. Multiubiquitinated proteins are recognized by the 26S proteasome and degraded. This irreversible process has evolved into a central regulator of many different signaling pathways.

The book is organized into two discrete sections. The first six chapters are concerned with the molecular entities that are involved in all aspects of ubiquitin metabolism from ubiquitin itself, through activating/conjugating/ligating enzymes to de-ubiquitinating enzymes. These chapters also include discussion of the 20S and 26S proteasomes, which are the terminal components in the pathway for degradation of ubiquitin-tagged proteins. This section of the book is thorough and up-to-date. The cataloguing of enzymes involved in ubiquitin metabolism—made possible by the *Saccharomyces cerevisiae* genome project and the extension of this molecular analysis using publicly available EST (expressed sequence tag) databases—gives the reader a real sense of the complexity of the ubiquitin system. I particularly enjoyed Martin Rechsteiner's review of the biology of the 26S proteasome and appreciate his efforts to develop a clear nomenclature for the naming of the 26S subunits.

Concerning nomenclature, this book would have been an ideal place for the editors to forge some consensus among the chief players in the field with respect to two somewhat annoying aspects of variable nomenclature found in the primary literature and reproduced here. The first concerns the verb defining ubiquitin transfer to a protein: is it (1) to ubiquitinylate or (2) to ubiquitylate or (3) to ubiquitinate? It does not matter which, I would just like to see some uniformity. The second concerns the naming of human homologues of ubiquitin conjugating enzymes. So far they seem to have been named either with respect to their order of discovery or with respect to their homology to one of the thirteen *S. cerevisiae* enzymes. This leads to confusion; for example, UbcH2 is not the human homologue of yeast UBC2—rather, it is most closely related to yeast UBC8.



The second section of the book has separate chapters devoted to distinct biological processes in which ubiquitination has an important regulatory role. Included here are chapters discussing antigen processing, the N-end rule, transcription factors (such as NF-κB) p53, the cell cycle and integral membrane proteins. The final two chapters review the ubiquitin-independent but proteasome-dependent degradation of ornithine decarboxylase, and the role of ubiquitin in the pathology of human disease, with particular reference to neurodegeneration and the stress response. Once again the authors have done well in reviewing these fast-moving fields, and the editors have done a good job in maintaining uniformity of detail and depth of coverage. Although the nature of such a book is to review, the authors always run the risk of discussing outdated material as a result of late-breaking journal articles that miss inclusion. In the cell-cycle chapter, the authors attempted to correct this by adding a one page 'note added in proof' summarizing the recent findings from several groups on the role of SCF (a Skp1/Cdc53/F-box complex) in the degradation of G1 cell-cycle regulators, and the further molecular characterization of the anaphase-promoting complex. This is a valuable addition to the chapter. I was somewhat disappointed that the editors did not urge the authors of some of the other chapters to summarize recent very important findings on, for example, the conjugation of sumo and Rub1 to target proteins by UBC9 and UBC12, the role of mdm2 in controlling p53 degradation, and the cloning and characterization of the I-κB kinases IKK1 and IKK2 and their role in targeting I-κB for degradation.

This minor criticism notwithstanding, the book is a fine text for graduate students and other newcomers to the field, and will become an important reference volume for all of us intrigued by the manifold complexities of the ubiquitin system.