finds, at the very end of the book, that 'While sustainability can mean different things to different people, it is clear that the process of defining and understanding the concept is a critical starting point to developing and implementing an agenda for sustainability in every country'.

The media practitioners are not overtly fond of hairsplitting in the academic discourses. Moreover, they – especially in the news and current affairs section – are wary of taking sides even with the agendas of international bodies. So they would stop short of reporting events organized to popularize the internationally declared Days or Weeks or even Decades devoted to sustainable development or water or environment or forests. But they would hesitate to be seen as campaigners or crusaders for the international community.

Though the book tries to link sustainability to Indian traditions and Gandhian ideals, it also reports that the concept of sustainability is seen as 'Western' by the English-speaking elite in India and as a 'Western ploy' by the magazine analysed by the study. These are, of course, causes of grave concern to the policy makers, especially in today's political and economic context. For evidence-based decision-making, policymakers need clearer understanding and scientifically up-to-date information.

This is where the author is on a weak wicket. The book does not take into consideration the scientific studies on the evolution of ecological niches and succession. Dealing with the concept only in the linear range of 'sustainability' is an inherent limitation in the understanding of not only the environment, but also of media and communication.

There is, indeed, a mention of non-linear dynamic interrelationships of new media in chapter 4, which reviews the existing communication theories. But the two pages devoted to the topic are a clear indication that the author is not aware of scientific studies in the recent decades on complex systems and networks.

This weakness in the book is not surprising because the university system separates science, humanities and arts. And media is usually clubbed with arts. The closest link is to humanities. Science is a distant cousin. It is this context which helps us understand the limitations of a Ph D thesis, where magazine reports with any statistics are considered as scientific framing of messages.

1. Review of Contexts and Structures for Education for Sustainable Development 2009, UNESCO; unesdoc.unesco.org/images/0018/001849/184944e.pdf
2. Media as partners in education for sustainable development: a training and resource kit; http://unesdoc.unesco.org/images/0015/001587/158787E.pdf (accessed during December 2014).

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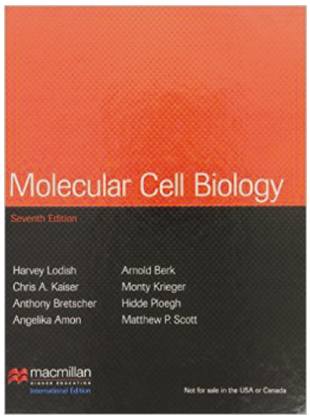

Molecular Cell Biology. Harvey Lodish *et al.* W. H. Freeman and Company, New York. 2014. 1154 pp. 7th edn. ISBN-13:978-1-4641-0981-2.

This is a well written textbook for advanced graduate-level studies in molecular biology, cell biology and biochemistry. It represents the fundamental concepts as well as current information on cell and molecular biology. The authors, who are all world-class researchers and teachers, have incorporated medically relevant examples which connect cell biology and human health. They have also done a good job in covering molecular cell biology in depth.

The full range of molecular cell biology is covered in over 1154 pages under 24 chapters divided into four parts. In this edition, the authors have revised several chapters and have incorporated advanced experimental technologies like DNA and RNA sequencing which revolutionized biomedical sciences. New and improved chapters like 'Molecules, cells and evolution' (chapter 1) provide considerable insight into the evolution of genes and organisms. The chapter 1 has also incorporated particular unicellular and multicellular model organisms to study specific genes and proteins that are important for cellular function. Chapter 2 describes how life of a cell depends on thousands of chemical interactions and reactions that are influenced by genetic instruction and environment of the cell. Chapter 3 describes structural and functional aspects of proteins at the molecular level and discusses the commonly used techniques for identifying, isolating and characterizing proteins in the advanced field of proteomics. Chapter 4 describes structural and functional aspects of nucleic acids, DNA repair mechanism and viral genome. The authors emphasize the role of HPV (human papilloma virus) in the development of cervical cancer. Chapter 5 describes various molecular genetics techniques for isolation, sequencing and manipulating specific regions of the DNA of an organism. Application of *in situ* hybridization using non-radioactive probes, quantitative RT-PCR and high-throughput DNA sequencing are also highlighted in this chapter. The authors have included a variety of techniques for analysing the location of proteins in the cell and localization of gene expression pattern. A variety of molecular techniques are well presented to study the expression and function of individual genes. Chapter 6 gives an overview of characteristics of eukaryotic nuclear and organellar genomes, the features of genes and other DNA sequences that comprise the genome, and how this DNA is structured and organized by proteins within the cell. Application of DNA fingerprinting using microsatellite markers and PCR is also mentioned in this chapter. Chapter 7 gives a good overview of regulation of gene expression at transcriptional level in bacteria and eukaryotes. Epigenetic mechanisms of transcriptional regulation and transcriptional regulation by non-coding RNAs (e.g. Xist in X-chromosome inactivation) are incorporated in this chapter. Chapter 8 gives a detailed overview of post-transcriptional control of gene. Chapters 10 and 11 present the structural and functional aspects of cell membrane. Structure and functional mechanism of Na^+ K^+ ATPase, multidrug transporter (MDR1), and cystic fibrosis transmembrane regulator (CFTR) are introduced in this edition in

chapter 11. Chapter 12 describes the molecular mechanisms by which cells use sunlight or chemical nutrients as a source of energy, with special focus on how the cell converts these external sources of energy into biologically universal, intracellular, chemical energy carrier. Chapters 13 and 14 describe protein targeting and protein sorting inside the cell. Chapters 17 and 18 discuss how microtubules and microfilaments regulate cell shape and cellular movement. Chapter 19 gives an overview of eukaryotic cell division. Chapter 20 provides a deeper understanding of how cells are organized inside the tissue, with special emphasis on structural and functional level of extracellular matrix. Chapter 22 gives a good overview of functional aspects of nerve cells at cellular and molecular level with the opening of new areas like synapse formation in neuromuscular junctions and structure of nicotinic acetylcholine receptor. Chapter 23 discusses vertebrate immune system with particular emphasis on cell types involved in immune system, highlighting the role of Toll-like receptors in inflammation. Chapter 24 gives an overview of the properties of tumour cells; it describes the multistep process of oncogenesis and the role of somatic and inherited genetic changes and as well as that of carcinogens that lead to oncogenesis. The author emphasize the microarray expression analysis of breast cancer tumours to distinguish gene expression pattern and individual treatment.

The other newly incorporated chapters are 9, 15, 16 and 21. Chapter 9 entitled 'Culturing, visualizing and perturbing cells' includes cutting-edge methods like FRET and siRNA technology. Chapters 15 and 16, i.e. 'Signal transduction and G protein-coupled receptors' and 'Signaling pathways that control gene expression' incorporate the simplified overview of signalling pathways to help students understand complex biological mechanisms in the cell. Chapter 21 on 'Stem cells, cell asymmetry and cell death' incorporates the role of induced pluripotent stem cells (iPS), and the authors have also discussed how cells become polarized and how asymmetric cell division is critical for maintaining stem cells and their role in generating differentiated cells. In chapter 16 the authors focus on the role of hedge signalling, NF-κB signalling and B-Raf kinase in progression of tumour. Rapidly emerging field of stem cell biology like regulation of gene expression in embryonic stem cells and regulation of cell death are presented in chapter 21.

This book has contributions from a variety of authors who are specialized in different research areas of molecular cell biology. The language is lucid and the illustrations are excellent with many colour diagrams, tables, chart and photographs. There is enough introduction to higher-level concepts of molecular cell biology which could direct the students to read relevant journals. Another feature of the book is the detailed glossary of terms, which will be useful to newcomers in the field for overcoming the technical jargon that can be a barrier. The authors have mentioned many advanced clinical applications of basic cellular and molecular biology which are used in the treatment of cancer and other important human diseases throughout the chapters.

The book is suitable for an advanced course in the field, where the flow of subject content need not be as smooth as an introductory textbook written by a single author. It provides detailed information that is useful to students and researchers who have already been introduced to the field of molecular cell biology. The topics of a chapter are presented at the start of each chapter. The book has its companion website (www.whfreeman.com/lodish7e) which contains a variety of resources that can be downloaded and used by teachers and students. Some chapters include recent references and some others include old references.

In recent advancements in technology, nanoparticles (NPs) have been increasingly developed in various biomedical applications such as cell tracking and targeted drug delivery. Cellular responses to NPs, their uptake, and adverse biological effects caused by NPs are rapidly growing research areas. However, NP excretion and its underlying mechanisms and cell signalling pathways are still elusive. The role of NP at cellular level is totally missing in the current edition. In future editions, authors may like to focus on an overview of how NPs are handled intracellularly and how they are excreted from cells following the uptake. They could also highlight separately the role of cellular senescence (which refers to the essentially irreversible arrest of cell proliferation (growth) which occurs when cells experience potentially oncogenic stress) in ageing and cancer in a future edition. There is also a lacuna regarding 'autophagy', which is a cellular degradation pathway for the clearance of damaged or superfluous proteins and organelles. Recent evidences suggest that autophagy provides a protective function to limit tumour necrosis and inflammation, and helps mitigate genome damage in tumour cells in response to metabolic stress. The authors also need to evaluate the role of exosomes, which are nanovesicles that are released into the extracellular environment during the fusion of multivesicular bodies with the plasma membrane. Exosomes released from dendritic cells, dexosomes, have several biological functions, for example, as immunostimulants. Some tumour cells also secrete exosomes (Tu-exosomes). Tu-exosomes may have physiological functions. The authors should provide table of contents and list of figure in the early section separately. Use of next-generation sequencing that has led to the development of new areas of molecular cell biology research and use of computational database application (NCBI, UCSC, ENCODE and ENSEMBL) in genome annotation are essential to evaluate in a future edition.

I would recommend this book for all libraries of universities and research centres where biomedical sciences are pursued, since it is a comprehensive book covering the broad areas of molecular cell biology. With the inclusion of some of the current concepts like role of NPs, exosomes and cellular senescence, the book would be more useful to students and researchers.

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