build upon one another. The first emphasizes molecular mechanisms related to how developing organisms interact with the natural world, the second expands these mechanisms in the context of mankind's effects on the environment, and the third emphasizes how various biological disciplines can work together to tackle these ideas. Fields of study that serve as common threads through each section include symbiosis/mutualism, epigenetics, and phenomics.

The text does not shy away from discussing the public policy-related implications of biotechnology, and the authors emphasize that science and policy must be taught as integrated disciplines. Also supporting this multidisciplinary angle are the "Looking Ahead" sections which conclude each chapter. Here, the authors clearly outline important questions in the field which provide good resources for those unfamiliar with certain subdisciplines.

However, this degree to which the authors aim to integrate policy and science also manifests itself in material that's a bit unorthodox for a science textbook, such as what's found in the appendices and "Philosophical Coda." The appendices in particular are formatted less like the organized morsels of information found in most science textbooks and more as ethics and policy-based chapters that appear to have been mysteriously omitted from earlier sections. Additionally, there are at times clumsy commentaries, such as the authors' assertion that environmentally induced modifications of the genome were formerly considered impossible, when more precisely the modern concepts of genetics and epigenetics have developed together since the early part of the 20th century. Lastly, while many controversial topics are well-outlined, such as the use of pesticides and BPA-containing plastics, others go mostly unmentioned, notably plant GMOs and their uses in agriculture.

Overall, *Ecological Developmental Biology* is a good companion for the undergraduate or graduate interested in dwelling not only at the crossroads of molecular and ecological-based biology, but also in fields of public policy and philosophy.

Brenden Barco
Department of Molecular, Cellular and
Developmental Biology
Yale University

Molecular Biology: Structure and Dynamics of Genomes and Proteomes. *By Jordanka Zlatanova, and Kensal E. van Holde. New York, USA and Abingdon, UK: Garland Science, Taylor & Francis Group; 2016, US $122.49 (Hardcover). 648 p. ISBN: 978-0815345046*

Molecular Biology: Structure and Dynamics of Genomes and Proteome is a delightful read embodying the spirit of classroom teaching of fundamental concepts in molecular biology and their application, with a sense of history in the scientific discoveries that revolutionized the field of molecular biology. After publishing more than 30 articles together, Kensel E. van Holde and Jordanka Zlatanova have teamed up to churn out 22 chapters, particularly focusing on the protein and nucleic acid machinery in the cell and their molecular interplay in biologically relevant processes such as transcription, translation, replication, recombination and repair. The expertize of both the authors in physical biochemistry and biophysics is reflected in the detailed description of the *modus operandi* of various instruments and techniques listed in the book. The illustrations (~ 700) are a visual treat for the readers and are enriched with high resolution structures of proteins and their complex with nucleic acids with a committed purpose of orienting the readers' attention toward the molecular details of the bio-macromolecules involved in various biological machinery.

The authors have cited pictorial examples of the erected stainless steel model of the alpha-helix (in front of Noble Laureate Linus Pauling's childhood home in Oregon, p. 43) and immunoglobin (in Scripps Research Institute, Florida campus, p. 543) structures to further drive this point home. The fully complementary figure legends accompanying the figures, especially the two or three tier figures on techniques, starting with the principle of operation and ending with examples of its applications, makes a lasting imprint on memory of the readers. The authors draw a seamless connection between the classical molecular and cell biology techniques and numerous recent advances in the field such as: CAGE and PET for gene expression studies (pp. 235-236) and FAIRE-sequencing (formaldehyde crosslinking efficiency) for isolating regulatory elements genome wide (pp. 298-300). Microscopy and spectroscopic techniques, which are presently considered quintessential components of molecular biology, are also vividly introduced in various chapters. Notable examples include atomic force microscopy (pp. 183, 195); cryo-electron microscopy (chapter 13 describes the translation machinery with numerous cryo-EM structures); clinical applications of NMR, such as MRI and MRS (p. 47); mass-spectrometry (p. 56); optical force microscopy (pp. 199-200) and single-molecule FRET (p. 209). The book also introduces the concept of interaction (network) maps which form the basic tenets of the newly emerging field of systems biology (pp. 258, 441, 442). The authors' efforts toward inculcating a sense of history in every discovery and concept is nailed in every chapter in numerous boxes and explicit timelines (eg. the timelines of evolution of the concept of gene and intracellular protein degradation, pp. 146 and 446, respectively). Another notable mention in the book is the dedicated section on the insights into gene regulation from ENCODE (The Encyclopedia of DNA Element), a public research project, launched 2003 as a follow-up to the Human Genome Project (Genomic Research). Interesting applications of molecular biology listed in the book that

merit comment include: (i) Topoisomerase inhibitors as anti-cancer agents (p. 83); gene therapy in disease management (p. 122); HIV detection by RT PCR (p. 118); production of human insulin for diabetes control (p. 117) and golden rice with higher content of iron and vitamin A (p. 121) by recombinant DNA-technology.

Taken together, *Molecular Biology: Structure and Dynamics of Genomes and Proteome* is a comprehensive book on molecular biology abreast with latest updates in the field and appropriately designed with crisp sub-sections for teaching in undergraduate courses and a useful reference book for graduate students in molecular biology, biophysics, and biochemistry.

Arunima Chaudhuri
Department of Cell Biology
Yale University School of Medicine

A Primer of Human Genetics. *By Greg Gibson. Sunderland, Massachusetts: Sinauer Associates; 2015, US $74.95 (Paperback). 442 p. ISBN: 978-1605353135*

A Primer of Human Genetics is a handy reference discussing the foundations, tools, and diseases relating to the human genome. This text excites the avid student to pursue research in genetics by providing insightful resources in a concise manner. Additionally, this text hits the mark on providing emerging methods and technologies into a quick reference with appended summary bibliography at the end of each chapter. The illustrations are clear and convey the overall broad aims without getting into the minutiae. Each figure plot or graph is well laid out and accompanied by an informative caption. As described in chapter 5, there is increasing push for personalized genomics as a parallel course of diagnosis and counseling. With the advent of environmental concerns and factors as possible influences, this text book also incorporates Chapter 9 on the epigenome.

Epigenetics is the study of how environmental factors influence the phenotypic outcome between two organisms with identical genetic information. This is most commonly exacerbated by regulated gene expression through DNA methylation. Chapter 9 provides a quick summary on the ENCODE project, techniques and current impacts of these environmental factors on the human genome. As discussed in the text, it is interesting to note that only 8 percent of the human genome is highly conserved. Therefore, the remaining sequence is most often regarded has “filler or junk” DNA. However, the structure and dynamics of chromatin resulting from the whole sequence could also influence gene expression. Thus, the Encyclopedia of DNA Elements (ENCODE) initiative was launched and currently ever increasing the opportunities within this field.

Overall, this textbook is a great addition to a reference library. The author does a great service to the field by providing this informative resource. This text would be a useful resource to an upper division undergraduate or graduate student in a genetics course. Additionally, it would be an invaluable resource to an enlightened researcher ready to make the jump from fundamental to translational research by providing the necessary background for a successful project development and grant submission.

Eric M. Johnson Chavarria
Molecular Biophysics and Biochemistry
Yale School of Medicine

In the second part, we focus on the molecular mechanisms responsible for the fast evolution of two specific classes of tandem repeats: minisatellites and microsatellites.Â Repeated DNA sequences in eukaryotic genomes and mechanisms of evolution. The two main categories of repeated elements (tandem repeats and dispersed repeats) are shown, along with subcategories, as described in the text.Â Sequencing of the macronuclear genome of this ciliate revealed three whole-genome duplications (and possibly a fourth, more ancient), comprising a very recent event occurring before the divergence of P. tetraurelia and P. octaurelia, an old event that occurred before the divergence of Paramecium and Tetrahymena and an intermediate event. We focus on models of the dynamics of epigenetic modifications, of proteinâ€“DNA interactions, and the polymer dynamics of chromosomes. These approaches provide reliable frameworks to integrate additional biological data; enable accurate, genome-wide predictions; and allow the discovery of new mechanisms. Keywords.Â Springer series in molecular and cell biology. Springer, New YorkGoogle Scholar. Vazquez J, Belmont AS, Sedat JW (2001) Multiple regimes of constrained chromosome motion are regulated in the interphase Drosophila nucleus.Â Fahmi Z., Sewitz S.A., Lipkow K. (2018) Systems Biology of Genome Structure and Dynamics. In: Rajewsky N., Jurga S., Barciszewski J. (eds) Systems Biology. RNA Technologies. His research has focused on the structure and function of oxygen transport proteins and the structure of chromatin. He is among the world's leading experts in biophysical chemistry and is the author of multiple textbooks. Read more.Â At first it may seem like this book is hard to read, but it will grow on you if you remain focused. I wish it had a different organization. Example: The first page may suggest that you look at figure 1.1, which you might have to find 3 pages later, which I find distracting.