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Biology and Biotechnology. Science, Applications, and Issues

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The authors are affiliated with the University of Utah and with the A. Massey & Associates, Chapel Hill, North Carolina. In the foreword written by Bruce Alberts, President of the National Academy of Science, it is stated that in the last century, science and technology have utterly transformed our lives. It is accentuated that the authors produced a new kind of textbook, triggering a widespread change in how to teach a subject. As declared in the preface by the authors, the goal of this publication was to create text that would give readers the foundation they needed for understanding many inevitable advances in biotechnology that the coming years will bring. The volume is composed of three parts, arranged to 24 chapters.

Part 1 “Perspective” opens with the chapter on general critical interrelationship between science, technology, and society. It is emphasized here that technologies not only alter the environment

– they change people, and also provide doors to unforeseen innovations, novel applications, and unexpected social changes. Subsequent text points up how science works, development of science in past two centuries, the history of crop genetic modifications, new understanding the heredity, and the like.

Part 2 “The Foundational Science” (chapters 2 through 14) explores the cell, notably molecular components of cells, expression of genetic information, protein structure and function, cell metabolism, cells maintain their internal environment, cell respond to their external environment, cell grow and reproduction, and cell differentiation. Concluding four chapters give special attention to patterns of genetic inheritance, relations between genotype and phenotype, evolutionary mechanisms, and ecological interaction.

Part 3 “Biotechnology Applications and Issues” (chapters 15 through 24) embraces in two chapters the biotechnology toolbox

and biotechnology in the research laboratory. Concluding eight chapters point up commercial applications, namely moving science from the laboratory into society risks and regulations, health care applications, medical biology in society, biotechnology in society, ecology and evolution in agriculture. Final two chapters implicate biotechnology and sustainable agriculture, and environmental sustainability. Particular chapters include summary points and key terms. In addition to the current text, there are separate textual and figure boxes containing supplemental information. The volume

presents an extraordinary wealth of mostly colour illustrations: line drawings and photographs featuring fundamental biological processes, cells, plants, animals and protists, diagrams and miscellaneous schemes, laboratory setups and procedures, and many more. The reader only may miss some references.

Biology and Biotechnology is largely intended for undergraduate nonmajor science courses; however, biology majors will benefit from the unique perspective.

Jindřich Jíra