BOOK REVIEW

Problemas de Biología Celular (Problems in Cell Biology)
Edited by Laura Walker, M Julieta González and Enrique Castellón.
Santiago, Chile: Colección Textos Universitarios, Editorial Universitaria. 1998.
334 pages. ISBN 956-11-1315-5.

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This textbook, the first of a series of two entitled "*Problemas de Biología Celular y Genética*" (Problems in Cell Biology and Genetics), attempts to provide a much needed questions-and-answers book to supplement current cell biology textbooks, especially those that have been translated into Spanish, which often lack such helpful addenda. The book is targeted to Spanish-speaking undergraduate biology students, particularly those in biomedical careers, the subject headings being ordered according to the current sequence taught by the authors to medical students.

The book is divided in two parts: Organization and Basic Processes of the Cell, and Cell Reproduction and Differentiation. Each contains six chapters by different contributing authors. In every chapter, approximately 15 to 25 problems are proposed which broadly but not exhaustively cover the chapter subject. After each problem is stated, several questions intended to guide the student toward the solution, as well as to test factual knowledge, are posed. At the end of the chapter, answers to the questions are furnished together with a variable number of general and specific references.

The stated aim of this textbook is to partially bridge the gap between the usual overload of bookish facts that undergraduates are often required to absorb passively, and active learning at the laboratory bench, where unprecedented ideas and novel points of view are sometimes shaped so gratifyingly. Accordingly, the authors have made a special effort to state the problems clearly and concisely, and to make the questions as unequivocal and devoid of personal bias as possible, a difficult task at best. In the various subjects, they succeed to different extents.

The first chapter, by Enrique Castellón, entitled Molecular Organization and Bioenergetics of the Cell, deals with specific questions in the basic biochemistry required by the student to master a molecular vocabulary describing cell structure and energy flow. Perhaps due to the very nature of this subject, the problem form is sometimes abandoned; it is replaced by direct questions demanding that the student supply specific facts instead of building on or interpreting a given set of them.

The structure and function of the plasma membrane and the synthesis, modification and sorting of cellular proteins are addressed by M Julieta González, Cecilia Alliende and Cecilia Leyton in the following two chapters. Ample material has been culled from classical papers and is presented with only such modifications as required for brevity. Some of the problems contain an extensive explanatory background which should prove especially helpful.

A collection of problems by Cecilia Leyton, related to cytoskeletal structure and function conforms the next chapter. It provides a good coverage of the subject, although the emphasis is placed on material obtained from standard textbooks or review journals, thus in

some measure dulling the edge of discovery. Surprisingly, none of the problems present results obtained in models from human pathology, such as Duchenne muscular dystrophy or the interaction between *L. monocytogenes* and human host cells.

The last two chapters of the first part of the book are contributed by M Soledad Berríos, and they deal with nuclear structure and gene expression. In these chapters, the aim of the book is quite successfully achieved. The clear presentation of results from milestone papers in the development of our present understanding of the nature and function of genetic material is very effective, providing an accurate background and then allowing the data to address the reader directly.

The second half of this work opens with a chapter on the cell cycle, by Gamaliel Ordenes. The problems posed provide good coverage of the "machinery" of the cycle, but do not venture further. This was surprising since, in the last few years, an explosive development has occurred in research pertaining to cell cycle regulatory mechanisms, opening new prospects that could possibly lead to a better understanding of tumor cell proliferation. Likewise, no mention is made of apoptosis, which may at present be the most active research field in cell biology.

The next four chapters concern reproductive biology: meiosis, by the series editor, Laura Walker; female gamete production by Margarita Vega; spermatogenesis, by Juan Balbontín, and fertilization, by Rosita Smith. The questions and problems in these chapters outline the main themes of a good introduction to reproductive biology, with a clear emphasis on morphology and basic physiological data.

The chapter on cell differentiation, by Enrique Castellón and Marta Riffo, closes the second part of the book. Their approach is to propose problems strictly within the field of classical embryology, waiving the mechanistic insights provided by the study of sequential gene expression with the tools of modern molecular biology.

Summing up, I would say the authors have succeeded to a fair extent in the difficult task of conveying to a student audience a breath of the intellectual aroma, the thrill and the portent that surround the birth of original thought. Obstacles are predictably encountered when problems metamorphose into narrow or naive questions, demanding strict factual answers that in greater measure reflect the points of view (or prejudices) of the questioner, than the voice of the facts on which the subject is built.

Just as the prospective author of a new textbook of cell biology would be well advised to assess carefully a canonical opus such as "Molecular Biology of the Cell" by Alberts *et al*, a new edition of the book reviewed here should consider the addition of some features found in its successful companion, "Molecular Biology of the Cell: The Problems Book", by John Wilson and Tim Hunt. First, the authors should provide, as do Wilson and Hunt at the beginning of each chapter, references to the pages of current cell biology textbooks where the subject matter being covered by the proposed problems can be found. Secondly, even though no Instructor Book was planned, it would be helpful to include problems for which no solutions are supplied in the answers section of the chapter. In my experience, if such problems are carefully selected, they fire the imagination and powerfully stimulate personal research and original thought.