

Book Review

Preparative Centrifugation: A Practical Approach **by David Rickwood, Editor**

Oxford University Press, New York, 1993. 420 pages. \$44.00

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Sedimentation is still one of the most powerful tools in biology. It serves as a vehicle for both preparatory and analytical purposes. In the preparatory mode, it is used in separating macromolecules; and in the analytical mode, it remains one of the best approaches in studying macromolecules and assembly processes. The theory that governs the technique is certainly based on well tested physical principles. Consequently, results can be quantitatively predicted, if the physical properties of the system under investigation are known, or experimental conditions can be designed to maximize the chance of success. Although there is no recent advancement in the basic theory of sedimentation, there is rapid development in the designs of components involved in sedimentation, in particular, for preparatory purposes, e.g., rotors and media for density gradient. Hence, it is timely to summarize these achievements in a book such as this one edited by Dr. D. Rickwood.

"This book sets out both to provide instant solutions for a very wide range of separations as well as providing the reader with insights to the bases of the different types of separations..." wrote Dr. Rickwood. To this end, this book contains many very useful and practical informations that are intimately linked to the success of an experiment, e.g., choice of rotors, centrifuge tubes, matrix for density gradient, and computer programs for calculating parameters.

Two chapters are dedicated toward isolation of biomacromolecules. In chapter 3, Drs. Dobrota and Hinton describe in detail the theoretical and practical considerations involved in conducting density gradient separations. It is one of the better chapters in this topic and it is full of helpful hints to optimize experimental conditions. In chapter 4, Dr. Rickwood describes a range of centrifugal methods to separate biomacromolecules including pro-

teins, nucleic acids, nucleoproteins and proteoglycans. The methods that are discussed are differential pelleting, isopycnic and rate-zonal centrifugation. Specific protocols for fractionation of biomacromolecules are included to assist novices.

Separation and characterization of mammalian cells, cell organelles, and membranes are discussed in two separate chapters. Although the techniques employed are mostly the same, specific attention has been paid to discussions on issues pertaining to these more complicated and fragile biological samples.

The theme of this book is to provide a practical approach. Nevertheless, practitioners of any procedure should not operate in total ignorance of the theory that governs the technique. Armed with a knowledge of fundamental principles of centrifugation, investigators can and will acquire significant insights on the systems under investigation even during the preparatory stage. Hence, the chapters on the theoretical aspects of centrifugation and measurements of sedimentation coefficients are important and should not be omitted by investigators in their rush to get the separation procedure established. The two minor disappointments in these two chapters are that they are not better integrated and the lack of discussion on the information of macromolecular interactions that can be gleaned from these "preparative" approaches. It does not help the reader of chapter 1 to be constantly referred to chapter 5 for definitions and equations on terms introduced in chapter 1. However, these are minor critiques of an otherwise very useful text on a popular technique. This book most likely will be helpful to biologists as a reference text that contains most of the practical information required for separation of biological material by centrifugation.