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Book Review: *The Baculovirus Expression System: A Laboratory Guide* (1992) King, L. A. & Possee, R. D.

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King, L. A. & Possee, R. D. 1992. *The Baculovirus Expression System: A Laboratory Guide*. Chapman and Hall, New York. 229 pages, illustrated (\$65.00)

The power of molecular biology is unleashed with the ability to clone and sequence genes, and then express these genes in heterologous systems. This sets the stage for the full analysis of proteins that are otherwise difficult to isolate and/or purify, especially when present at very low copy number per cell or when isolated from relatively precious materials. Overexpression of protein is now possible in a number of systems including prokaryotes (e.g., *E. coli*) and various eukaryotes (yeast, insects, and plants). The issue then becomes, which system (1) most closely reflects the homologous expression with respect to posttranslational modifications, (2) minimizes the input effort while maximizing protein yield, (3) is safe to use, and/or (4) is cost effective. For some time, molecular biologists have utilized the genetically manipulated baculovirus infection of insect cells as the method of choice for expressing eukaryotic genes for the purpose of overproduction and isolation and purification of desired proteins. These systems are now widely available (even to the extent of being commercially available), and the baculovirus genome has been manipulated extensively as a biotechnological tool for expressing foreign genes. This book is a timely publication for those interested in exploiting this powerful biotechnological tool.

The book includes a highly detailed Table of Contents, adequate indexing, extensive referencing to primary literature, and a list of selected suppliers of specialty reagents. Though a hardcover book, it has a spiral binder to permit lying open on the benchtop. The authors introduce the baculovirus system logically and present the historical and biological rationale for utilizing the baculovirus, including "Advantages" and "Disadvantages." Chapter 3 explains the posttranslational modifications of proteins that may be expected in insect cells, including: (1) glycosylation of membrane targeted or secreted proteins, and (2) phosphorylation, acetylation, or amidation. Several examples of each are presented and documented. Chapter 4 describes the vector construction starting with DNA fragment isolation and modification to transfer vector preparation to ligation, transformation, and screening. There is an apparent lack of concern by the authors that the starting DNA fragment should not have introns, inasmuch as there is no good evidence that the baculovirus transcription complex can splice out introns of RNA.

Chapters 5 and 6 give extensive and useful details of the culturing of insect cells and the propagation and characterization of the genetically manipulated baculovirus. Chapters 7 and 8 then get to the heart of the matter; i.e., the production and characterization of recombinant viruses. With the latter chapters, the quality and quantity of overexpressed protein may be evaluated. They include also examples of SDS-PAGE, Western blot and Northern blot analyses, which permit the investigator to gauge the success of expression relative to a "typical" result. Chapters 9 and 10 instruct the reader as to how to scale up the system, including the use of insect larvae. Chapter 11 is entitled "Troubleshooting guide" and will most probably be the prime target for addition and editing of a second edition.

The methods discussed are thoughtfully presented so that the nonvirologist or the novice molecular biologist may have a satisfactory first-time experience in baculovirus expression. The authors assume a reasonable degree of expertise in molecular biology on the part of their readers. Although the book is extensively and well illustrated to support the text, the non-molecular biologist will struggle with the jargon and methods. However, those with a modicum of training in molecular biological techniques (with a budget to support the habit) will find this book an invaluable resource for cloning and expressing proteins of interest.

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