## Contents

| Preface | .......................................................... v |
| Contributors | .......................................................... xi |

### Part I  Introduction

1. Useful Tips, Widely Used Techniques, and Quantifying Cell Metabolic Behavior .......................... 3
   **David W. Murhammer**

### Part II  Baculovirus Molecular Biology/Development of Recombinant Baculoviruses

2. Introduction to Baculovirus Molecular Biology .......................................................... 25
   **Barbara J. Kelly, Linda A. King, and Robert D. Possee**

3. Baculovirus Transfer Vectors .......................................................... 51
   **Robert D. Possee and Linda A. King**

4. Recombinant Baculovirus Isolation .......................................................... 73
   **Linda A. King, Richard Hitchman, and Robert D. Possee**

5. Gene Expression in Mammalian Cells Using BacMam, a Modified Baculovirus System ................. 95
   **James A. Fornwald, Quinn Lu, Frederick M. Boyce, and Robert S. Ames**

### Part III  Insect Cell Culture

6. Available Lepidopteran Insect Cell Lines .......................................................... 119
   **Dwight E. Lynn and Robert L. Harrison**

7. Lepidopteran Insect Cell Line Isolation from Insect Tissue ............................................ 143
   **Dwight E. Lynn**

8. Development of Serum-Free Media for Lepidopteran Insect Cell Lines .................................. 161
   **Leslie C.L. Chan and Steven Reid**

9. Routine Maintenance and Storage of Lepidopteran Insect Cell Lines and Baculoviruses ............ 197
   **Dwight E. Lynn and Robert L. Harrison**

### Part IV  Protein Production with Recombinant Baculoviruses

10. Small-Scale Production of Recombinant Proteins Using the Baculovirus Expression Vector System .......................................................... 225
    **Jian-Ping Yang**

11. Recombinant Protein Production in Large-Scale Agitated Bioreactors Using the Baculovirus Expression Vector System .......................................................... 241
    **Christine M. Thompson, Johnny Montes, Marc G. Aucoin, and Amine A. Kamen**
Contents

12 Protein Expression in Insect and Mammalian Cells Using Baculoviruses in Wave Bioreactors .................................................. 263
   Sue H. Kadwell and Laurie K. Overton

13 Protein Production with Recombinant Baculoviruses in Lepidopteran Larvae .......................................................... 285
   Elena Kovaleva and David C. Davis

14 Production of Virus-Like Particles for Vaccination .............................................. 299
   Christine M. Thompson, Marc G. Aucoin, and Amine A. Kamen

15 Alternative Strategies for Expressing Multicomponent Protein Complexes in Insect Cells ........................................ 317
   Stephanie Chen

PART V RECOMBINANT PROTEIN PRODUCTION WITH TRANSFORMED INSECT CELLS

16 Transforming Lepidopteran Insect Cells for Continuous Recombinant Protein Expression ............................................. 329
   Robert L. Harrison and Donald L. Jarvis

17 Stable Drosophila Cell Lines: An Alternative Approach to Exogenous Protein Expression ........................................... 349
   Marija Backovic and Thomas Krey

18 Transforming Lepidopteran Insect Cells for Improved Protein Processing and Expression ........................................ 359
   Robert L. Harrison and Donald L. Jarvis

PART VI BACULOVIRUS DEVELOPMENT AND PRODUCTION FOR USE AS INSECTICIDES

19 Introduction to the Use of Baculoviruses as Biological Insecticides ........................................... 383
   Holly J.R. Popham, Tyasning Nusawardani, and Bryony C. Bonning

20 Baculovirus Insecticide Production in Insect Larvae ............................................. 393
   Nikolai van Beek and David C. Davis

21 Evaluation of the Insecticidal Efficacy of Wild Type and Recombinant Baculoviruses ........................................ 407
   Holly J.R. Popham, Mark R. Ellersieck, Huarong Li, and Bryony C. Bonning

PART VII MISCELLANEOUS TECHNIQUES AND APPLICATIONS OF THE Baculovirus/Insect Cell System

22 Evaluating Baculovirus Infection Using Green Fluorescent Protein and Variants ................................................. 447
   Hsuan-Chen Wu, Hyung Joon Cha, and William E. Bentley

23 Tubular Bioreactor for Probing Baculovirus Infection and Protein Production ............................................. 461
   Hsuan-Chen Wu, Yu-Chen Hu, and William E. Bentley
Contents

24 Gene Silencing in Insect Cells Using RNAi
   Hsuan-Chen Wu, John C. March, and William E. Bentley 469

25 Using the Baculovirus/Insect Cell System to Study Apoptosis
   Nor Chejanovsky 477

26 Generation of Envelope-Modified Baculoviruses for Gene
   Delivery into Mammalian Cells
   Christian Hofmann 491

Index 505
Baculovirus and Insect Cell Expression Protocols
Murhammer, D.W. (Ed.)
2016, XII, 508 p. 65 illus., 15 illus. in color., Hardcover
A product of Humana Press