

Table of Contents

CONTRIBUTORS TO VOLUME 118	xi
PREFACE	xvii
VOLUMES IN SERIES	xix

Section I. Cell Wall and Membrane

1. Isolation and Characterization of Plant Cell Walls and Cell Wall Components	WILLIAM S. YORK, ALAN G. DARVILL, MICHAEL McNEIL, THOMAS T. STEVENSON, AND PETER ALBERSHEIM	3
2. Isolation of the Plasma Membrane	THOMAS K. HODGES AND DAVID MILLS	41

Section II. Nucleus

3. Purification and Restriction Endonuclease Analysis of Plant Nuclear DNA	JOHN C. WATSON AND WILLIAM F. THOMPSON	57
4. Analyzing Genome Variation in Plants	CAROL RIVIN	75
5. Synchronization of Plant Cells in Culture and in Meristems by Aphidicolin	FRANCESCO SALA, MARIA GRAZIA GALLI, GUIDO PEDRALI-NOY, AND SILVIO SPADARI	87
6. Isolation and Characterization of DNA Polymerase α from Spinach	CHERYL WARD AND ARTHUR WEISSBACH	97

Section III. Cytoplasmic Protein Synthesis

7. Purification and Properties of Protein Synthesis Initiation and Elongation Factors from Wheat Germ	SANDRA R. LAX, STEPHEN J. LAUER, KAREN S. BROWNING, AND JOANNE M. RAVEL	109
8. The Wheat Germ Protein Synthesis System	S. N. SEAL, A. SCHMIDT, AND A. MARCUS	128

- | | | |
|---|---|-----|
| 9. Purification and Characterization of Polypeptide Chain Elongation Factor 1 from Plants | SHIN-ICHIRO EJIRI | 140 |
| 10. The Synthesis of High-Molecular-Weight Proteins in the Wheat Germ Translation System | M. D. MORCH,
G. DRUGEON,
W. ZAGORSKI, AND
A. L. HAENNI | 154 |

Section IV. The Chloroplast

A. Genome Structure

- | | | |
|---|-------------------|-----|
| 11. Isolation and Structural Analysis of Chloroplast DNA | JEFFREY D. PALMER | 167 |
| 12. Purification and Properties of Chloroplast DNA Polymerase | KRISHNA K. TEWARI | 186 |

B. Transcription-Translation

- | | | |
|--|--|-----|
| 13. Improved Preparative Methods for Isolation and Purification of Tobacco Chloroplast Ribosomes, Ribosomal Proteins, and rRNA | N. GAIL HEWLETT AND
DON P. BOURQUE | 201 |
| 14. Isolation and Characterization of Chloroplast and Cytoplasmic Transfer RNAs | ANDRÉ STEINMETZ AND
JACQUES-HENRY WEIL | 212 |
| 15. <i>In Vitro</i> Transcription of Chloroplast Protein Genes | EMIL M. OROZCO, JR.,
JOHN E. MULLET,
LINDA HANLEY-BOWDOIN,
AND NAM-HAI CHUA | 232 |
| 16. Chloroplast Gene Expression and Promoter Identification in Chloroplast Extracts | WILHELM GRUISSEM,
BRUCE M. GREENBERG,
GERARD ZURAWSKI, AND
RICHARD B. HALLICK | 253 |
| 17. Coupled Transcription-Translation in Chloroplast Lysates | J. D. J. BARD,
D. P. BOURQUE, AND
D. ZAITLIN | 270 |
| 18. Translation by Isolated Pea Chloroplasts | HELEN T. NIVISON,
LEONARD E. FISH, AND
ANDRE T. JAGENDORF | 282 |
| 19. Purification of Chloroplast Elongation Factors | ORSOLA TIBONI AND
ORIO CIFERRI | 296 |
| 20. Use of an <i>in Vitro</i> Dipeptide System to Determine the Translation Initiation Sites of Chloroplast Genes | MARK BLOOM, NATHAN BROTH,
BENNETT N. COHEN,
AND HERBERT WEISSBACH | 309 |

C. Photosynthetic Systems

- | | | |
|--|---|-----|
| 21. Isolation and Characterization of Chloroplast Envelope Membranes | KENNETH KEEGSTRA AND
ABDULLAH-E. YOUSIF | 316 |
| 22. Characterization of the Thylakoid Membrane by Subfractionation Analyses | BERTIL ANDERSSON | 325 |
| 23. Isolation of Chlorophyll-Binding Proteins of Green Plants | RICHARD S. WILLIAMS,
ELIZABETH K. SHAW,
LESLIE E. SIEBURTH,
AND JOHN BENNETT | 338 |
| 24. Subunit Structure and Biogenesis of ATP Synthase and Photosystem I Reaction Center | NATHAN NELSON | 352 |
| 25. Identification of cDNA Clones Representing Phytochrome and Other Low Abundance Red-Light Regulated Sequences | HOWARD P. HERSHEY AND
PETER H. QUAIL | 369 |
| 26. Identification and Characterization of the <i>psbA</i> Gene Product: The 32-kDa Chloroplast Membrane Protein | JONATHAN B. MARDER,
AUTAR K. MATTOO, AND
MARVIN EDELMAN | 384 |

D. RuBP Carboxylase

- | | | |
|---|---|-----|
| 27. Cloning and Expression of Genes for the Small Subunit of Ribulosebiphosphate Carboxylase | C. F. WIMPEE
AND E. M. TOBIN | 396 |
| 28. Separation and Reassembly of the Subunits of Ribulosebiphosphate Carboxylase | T. JOHN ANDREWS | 410 |
| 29. The Cloning and Expression in <i>Escherichia coli</i> of RuBP Carboxylase/Oxygenase Large Subunit Genes | C. R. SOMERVILLE,
L. MCINTOSH,
J. FITCHEN, AND
M. GUREVITZ | 419 |

Section V. Mitochondria

- | | | |
|--|---|-----|
| 30. The Isolation of Mitochondria and Mitochondrial DNA | MAUREEN R. HANSON,
MAURY L. BOESHORE,
PHILLIP E. MCCLEAN,
MARY A. O'CONNELL, AND
HELEN T. NIVISON | 437 |
| 31. Analysis of the Genome Structure of Plant Mitochondria | DAVID M. LONSDALE,
TONY P. HODGE, AND
PETER J. STOEHR | 453 |
| 32. Strategies for the Identification and Analysis of Higher Plant Mitochondrial Genes | ADAM J. DAWSON,
VALERIE P. JONES, AND
CHRISTOPHER J. LEAVER | 470 |

33. Preparation of Maize Mitochondrial DNA-Protein Complex for Electron Microscopy	C. S. LEVINGS III AND R. H. MEINTS	485
34. Isolation of Plant Mitochondrial RNA	DAVID B. STERN AND KATHLEEN J. NEWTON	488
35. Isolation and Characterization of Single-Stranded and Double-Stranded RNAs in Mitochondria	ANNE M. SCHUSTER AND PAUL H. SISCO	497

Section VI. Nitrogen Metabolism

36. Isolation and Characterization of Nitrogenase from <i>Klebsiella pneumoniae</i>	VINOD K. SHAH	511
37. Tn5 Mapping of Rhizobium Nitrogen Fixation Genes	G. DITTA	519
38. H ₂ Uptake Negative (Hup ⁻) Mutants of <i>Rhizobium</i> and Their Use in the Isolation of <i>hup</i> Genes	R. J. MAIER AND S. S. M. HOM	528

Section VII. Cell Culture and Transformation

39. Establishment of Calli and Suspension Cultures	ROBERTA H. SMITH	539
40. Protoplasts: Isolation, Culture, Plant Regeneration	INGO POTRYKUS AND RAYMOND D. SHILLITO	549
41. Fusion and Transformation of Plant Protoplasts	J. B. POWER, M. R. DAVEY, J. P. FREEMAN, B. J. MULLIGAN, AND E. C. COCKING	578
42. Organelle Transfer	ESRA GALUN AND DVORA AVIV	595
43. Induction and Selection of Chloroplast-Coded Mutations in <i>Nicotiana</i>	ROBERT FLUHR AND AGNES CSÉPLO	611

Section VIII. Gene Transfer

44. Gene Transfer in Plants: Production of Transformed Plants Using Ti Plasmid Vectors	STEPHEN G. ROGERS, ROBERT B. HORSCH, AND ROBERT T. FRALEY	627
45. Plasmid Vectors for the Genetic Analysis and Manipulation of Rhizobia and Other Gram-Negative Bacteria	R. SIMON, M. O'CONNELL, M. LABES, AND A. PÜHLER	640

46. Plant Virus Vectors: Cauliflower Mosaic Virus	N. BRISSON AND T. HOHN	659
47. Direct Gene Transfer to Plants	JERZY PASZKOWSKI AND MICHAEL W. SAUL	668

Section IX. Virology

48. Propagation and Purification of RNA Plant Viruses	LESLIE C. LANE	687
49. Propagation of DNA Viruses	TOM J. GUILFOYLE	696
50. <i>In Vitro</i> Transcription of Infectious Viral RNA from Cloned cDNA	PAUL AHLQUIST	704
51. Use of RNA Probes to Detect Plant RNA Viruses	S. J. GARGER AND T. H. TURPEN	717
52. Preparation and Use of cDNA Probes for Detection of Viral Genomes	PETER PALUKAITIS	723
53. ELISA Techniques	MICHAEL F. CLARK, RICHARD M. LISTER, AND MOSHE BAR-JOSEPH	742
54. Serotyping Plant Viruses with Monoclonal Antibodies	EDWARD L. HALK	766
AUTHOR INDEX		781
SUBJECT INDEX		811