

Table of Contents

CONTRIBUTORS TO VOLUME 68		
PREFACE		
VOLUMES IN SERIES		

Section I. Introduction

1. Recombinant DNA Techniques	JOHN F. MORROW	3
-------------------------------	----------------	---

Section II. Enzymes Used in Recombinant DNA Research

2. Directory of Restriction Endonucleases	RICHARD J. ROBERTS	27
3. Addition of Homopolymers at the 3'-Ends of Duplex DNA with Terminal Transferase	TIMOTHY NELSON AND DOUGLAS BRUTLAG	41
4. DNA-Joining Enzymes: A Review	N. PATRICK HIGGINS AND NICHOLAS R. COZZARELLI	50

Section III. Synthesis, Isolation, and Purification of DNA

5. Cloning of Hormone Genes from a Mixture of cDNA Molecules	HOWARD M. GOODMAN AND RAYMOND J. MACDONALD	75
6. Improved Phosphotriester Method for the Synthesis of Gene Fragments	S. A. NARANG, HANSEN M. HSIUNG, AND ROLAND BROUSSEAU	90
7. Synthetic Adaptors for Cloning DNA	R. J. ROTHSTEIN, L. F. LAU, C. P. BAHL, S. A. NARANG, AND RAY WU	98
8. Chemical Synthesis and Cloning of a Tyrosine tRNA Gene	EUGENE L. BROWN, RAMAMOORTHY BELAGAJE, MICHAEL J. RYAN, AND H. GOBIND KHORANA	109
9. Gel Electrophoresis of Restriction Fragments	EDWIN SOUTHERN	152
10. Elution of DNA from Agarose Gels after Electrophoresis	ROBERT C.-A. YANG, JOHN LIS, AND RAY WU	176
11. Two-Dimensional Electrophoretic Separation of Restriction Enzyme Fragments of DNA	S. G. FISCHER AND LEONARD S. LERMAN	183

12. Purification of DNA or RNA Sequences Complementary to Mercurated Recombinant DNA by Sulfhydryl Sepharose Chromatography	SHIRLEY LONGACRE AND BERNARD MACH	192
13. The Isolation of Extrachromosomal DNA by Hydroxyapatite Chromatography	M. SHOYAB AND A. SEN	199
14. Isolation of Specific RNAs Using DNA Covalently Linked to Diazobenzoyloxymethyl Cellulose or Paper	MICHAEL L. GOLDBERG, RICHARD P. LIFTON, GEORGE R. STARK, AND JEFFREY G. WILLIAMS	206
15. Detection of Specific RNAs or Specific Fragments of DNA by Fractionation in Gels and Transfer to Diazobenzoyloxymethyl Paper	JAMES C. ALWINE, DAVID J. KEMP, BARBARA A. PARKER, JAKOB REISER, JAMIE RENART GEORGE R. STARK, AND GEOFFREY M. WAHL	220

Section IV. Vehicles and Hosts for the Cloning of Recombinant DNA

16. Plasmids of <i>Escherichia coli</i> as Cloning Vectors	FRANCISCO BOLIVAR AND KEITH BACKMAN	245
17. Plasmid Cloning Vehicles Derived from Plasmids ColE1, F, R6K, and RK2	MICHAEL KAHN, ROBERTO KOLTER, CHRISTOPHER THOMAS, DAVID FIGURSKI, RICHARD MEYER, ERIC REMAUT, AND DONALD R. HELINSKI	268
18. <i>In Vitro</i> Packaging of λ <i>Dam</i> Vectors and Their Use in Cloning DNA Fragments	L. ENQUIST AND N. STERNBERG	281
19. <i>In Vitro</i> Packaging of λ and Cosmid DNA	BARBARA HOHN	299
20. <i>Escherichia coli</i> Plasmids Packageable <i>in Vitro</i> in λ Bacteriophage Particles	JOHN COLLINS	309
21. Transformation and Preservation of Competent Bacterial Cells by Freezing	D. A. MORRISON	326
22. Bacterial Transformation Using Temperature-Sensitive Mutants Deficient in Peptidoglycan Synthesis	M. SUZUKI AND A. A. SZALAY	331
23. <i>Bacillus subtilis</i> as a Host for Molecular Cloning	PAUL S. LOVETT AND KATHLEEN M. KEGGINS	342
24. Methods for Molecular Cloning in Eukaryotic Cells	A. F. PURCHIO AND G. C. FAREED	357

Section V. Screening and Selection of Cloned DNA

25. Colony Hybridization	MICHAEL GRUNSTEIN AND JOHN WALLIS	379
26. A Sensitive and Rapid Method for Recombinant Phage Screening	SAVIO L. C. WOO	389
27. Selection of Specific Clones from Colony Banks by Suppression or Complementation Tests	LOUISE CLARKE AND JOHN CARBON	396
28. Cloning of Yeast Genes Coding for Glycolytic Enzymes	MICHAEL J. HOLLAND, JANICE P. HOLLAND, AND KIMBERLY A. JACKSON	408
29. Hybridization with Synthetic Oligonucleotides	J. W. SZOSTAK, J. I. STILES, B.-K. TYE, P. CHIU, F. SHERMAN, AND RAY WU	419
30. <i>In Situ</i> Immunoassays for Translation Products	DAVID ANDERSON, LUCILLE SHAPIRO, AND A. M. SKALKA	428
31. Selection of Specific Clones from Colony Banks by Screening with Radioactive Antibody	LOUISE CLARKE, RONALD HITZEMAN, AND JOHN CARBON	436
32. Immunological Detection and Characterization of Products Translated from Cloned DNA Frag- ments	HENRY A. ERLICH, STANLEY N. COHEN, AND HUGH O. MCDEVITT	443
33. R-Looping and Structural Gene Identification of Recombinant DNA	MICHAEL ROSBASH, DALE BLANK, KAREN FAHRNER, LYNNA HEREFORD, ROBERT RICCIARDI, BRYAN ROBERTS, STEPHANIE RUBY, AND JOHN WOOLFORD	454

Section VI. Detection and Analysis of Expression of Cloned Genes

34. Maximizing Gene Expression on a Plasmid Using Recombination <i>in Vitro</i>	THOMAS M. ROBERTS AND GAIL D. LAUER	473
35. Use of the λ Phage Promoter P_L to Promote Gene Expression in Hybrid Plasmid Cloning Vehicles	HANS-ULRICH BERNARD AND DONALD R. HELINSKI	482
36. Use of Minicells for Bacteriophage-Directed Poly- peptide Synthesis	JOHN REEVE	493

37. Measurement of Plasmid Copy Number	H. MICHAEL SHEPARD AND BARRY POLISKY	503
38. Localization of Enzymes in Denaturing Poly- acrylamide Gels	R. P. DOTTIN, R. E. MANROW, B. R. FISHEL, S. L. AUKERMAN, AND J. L. CULLETON	513
AUTHOR INDEX		529
SUBJECT INDEX		549