

Methods in Enzymology

Volume 303

*cDNA Preparation
and Characterization*

EDITED BY

Sherman M. Weissman

BOYER CENTER FOR MOLECULAR MEDICINE
YALE UNIVERSITY SCHOOL OF MEDICINE
NEW HAVEN, CONNECTICUT



ACADEMIC PRESS

San Diego London Boston New York Sydney Tokyo Toronto

Table of Contents

CONTRIBUTORS TO VOLUME 303	ix
PREFACE	xiii
VOLUMES IN SERIES	xv

Section I. cDNA Preparation

1. Preparation of cDNA from Single Cells and Sub-cellular Regions	JANET ESTEE KACHARMINA, PETER B. CRINO, AND JAMES EBERWINE	3
2. High-Efficiency Full-Length cDNA Cloning	PIERO CARNINCI AND YOSHIHIDE HAYASHIZAKI	19
3. Preparation and Analysis of cDNA from a Small Number of Hematopoietic Cells	MENG LIU, Y. V. B. K. SUBRAMANYAM, AND NAMADEV BASKARAN	45
4. Optical Mapping: An Approach for Fine Mapping	CHRISTOPHER ASTON, CATHARINA HIORT, AND DAVID C. SCHWARTZ	55

Section II. Gene Identification

5. Current Status of Computational Gene Finding: A Perspective	RICHARD J. MURAL	77
6. Gene Identification by Exon Amplification	DEANNA M. CHURCH AND ALAN J. BUCKLER	83
7. Cosmid-Based Exon Trapping	JOHAN T. DEN DUNNEN	100
8. Direct cDNA Selection Using Large Genomic DNA Targets	ANDREW D. SIMMONS AND MICHAEL LOVETT	111
9. cDNA Selection: An Approach for Isolation of Chromosome-Specific cDNAs	SATISH PARIMOO AND SHERMAN M. WEISSMAN	127
10. Saturation Identification of Coding Sequences in Genomic DNA	KATHELEEN GARDINER	144

Section III. Patterns of mRNA Expression

11. cDNA Screening by Array Hybridization	RADOJE DRMANAC AND SNEZANA DRMANAC	165
12. DNA Arrays for Analysis of Gene Expression	MICHAEL B. EISEN AND PATRICK O. BROWN	179
13. Construction and Analysis of Arrayed cDNA Libraries	MATTHEW D. CLARK, GEORGIA D. PANOPOULOU, DOLORES J. CAHILL, KONRAD BÜSSOW, AND HANS LEHRACH	205
14. Principles of Differential Display	KATHERINE J. MARTIN AND ARTHUR B. PARDEE	234
15. READS: A Method for Display of 3'-End Fragments of Restriction Enzyme-Digested cDNAs for Analysis of Differential Gene Expression	YATINDRA PRASHAR AND SHERMAN M. WEISSMAN	258
16. A Modified Method for the Display of 3'-End Restriction Fragments of cDNAs: Molecular Profiling of Gene Expression in Neutrophils	Y. V. B. K. SUBRAMANYAM, NAMADEV BASKARAN, PETER E. NEWBURGER, AND SHERMAN M. WEISSMAN	272
17. Fluorescent Differential Display: A Fast and Reliable Method for Message Display Polymerase Chain Reaction	TAKASHI ITO AND YOSHUYUKI SAKAKI	298
18. Identification of Differentially Expressed Genes Using RNA Fingerprinting by Arbitrarily Primed Polymerase Chain Reaction	FRANÇOISE MATHIEU-DAUDÉ, THOMAS TRENKLE, JOHN WELSH, BARBARA JUNG, THOMAS VOGT, AND MICHAEL McCLELLAND	309
19. cDNA Representational Difference Analysis: A Sensitive and Flexible Method for the Identification of Differentially Expressed Genes	MICHAEL HUBANK AND DAVID G. SCHATZ	325
20. Suppression Subtractive Hybridization: A Versatile Method for Identifying Differentially Expressed Genes	LUDA DIATCHENKO, SERGEY LUKYANOV, YUN-FAI CHRIS LAU, AND PAUL D. SIEBERT	349
21. Reduced Complexity Probes for DNA Arrays	THOMAS TRENKLE, FRANÇOISE MATHIEU-DAUDÉ, JOHN WELSH, AND MICHAEL McCLELLAND	380
22. Targeted Display: A New Technique for the Analysis of Differential Gene Expression	ALASTAIR J. H. BROWN, CATHERINE HUTCHINGS, JULIAN F. BURKE, AND LYNNE V. MAYNE	392

Section IV. Functional Relationship among cDNA Translation Products

23. RNA Polymerase III-Based Two-Hybrid System	MARIE-CLAUDE MARSOLIER AND ANDRÉ SENTENAC	411
24. Screening for Protein-Protein Interactions	F. JOSEPH GERMINO AND NEAL K. MOSKOWITZ	422
25. Using the Lac Repressor System to Identify Inter- acting Proteins	NICOLE L. STRICKER, PETER SCHATZ, AND MIN LI	451
26. A Genetic Selection for Isolating cDNA Clones That Encode Signal Peptides	KENNETH A. JACOBS, LISA A. COLLINS-RACIE, MAUREEN COLBERT, MCKEOUGH DUCKETT, CHERYL EVANS, MARGARET GOLDEN-FLEET, KERRY KELLEHER, RONALD KRIZ, EDWARD R. LAVALLIE, DAVID MERBERG, VIKKI SPAULDING, JEN STOVER, MARK J. WILLIAMSON, AND JOHN M. MCCOY	468
27. The Signal Sequence Trap Method	KEI TASHIRO, TOMOYUKI NAKAMURA, AND TASUKU HONJO	479
28. Solid-Phase Differential Display and Bacterial Ex- pression Systems in Selection and Functional Analysis of cDNAs	STEFAN STÄHL, JACOB ODEBERG, MAGNUS LARSSON, ØYSTEIN RØSØK, ANNE HANSEN REE, AND JOAKIM LUNDEBERG	495
29. Transposon Mutagenesis for the Analysis of Protein Production, Function, and Localization	PETRA ROSS-MACDONALD, AMY SHEEHAN, CARL FRIDDLE, G. SHIRLEEN ROEDER, AND MICHAEL SNYDER	512
AUTHOR INDEX		533
SUBJECT INDEX		561