

Contents

[one] Introduction

- 1 HOW MODERN METHODS ARE SOLVING BIOLOGICAL PROBLEMS by Donald D. Brown

3

[two] Molecular Genetics

- 2 CHROMOSOMAL VARIATION AT THE MOLECULAR LEVEL IN CROP PLANTS by Richard B. Flavell 15
- 3 THE STRUCTURE AND EXPRESSION OF THE *SHRUNKEN* LOCUS IN MAIZE STRAINS WITH MUTATIONS CAUSED BY THE CONTROLLING ELEMENT *Ds* by N. Fedoroff and D. Chaleff 27
- 4 THE ORGANIZATION AND EXPRESSION OF MAIZE PLASTID GENES by Lawrence Bogorad, Earl J. Gubbins, Enno T. Krebbers, Ignacio M. Larrinua, Karen M. T. Muskavitch, Steven R. Rodermel, and Andre Steinmetz 35
- 5 MITOCHONDRIAL DNA PLASMIDS AND CYTOPLASMIC MALE STERILITY by D. R. Pring 55

[three] Commercial Applications

- 6 UTILIZATION OF GENETICALLY ENGINEERED MICROORGANISMS FOR THE MANUFACTURE OF AGRICULTURAL PRODUCTS by J. Leslie Glick, M. Virginia Peirce, David M. Anderson, Charles A. Vaslet, and Hung-Yu Hsiao 67
- 7 PRODUCTION OF A VACCINE FOR FOOT-AND-MOUTH DISEASE THROUGH GENE CLONING by Douglas M. Moore 89
- 8 HYBRIDOMA TECHNOLOGY AND ITS APPLICATION TO PROBLEMS IN VETERINARY RESEARCH by Richard A. Goldsby, S. Srikumarian, Albert J. Guidry, Steven J. Nickerson, and Rona P. Shapiro 107

[four] DNA Cloning

9	ORGANIZATION AND EXPRESSION OF SOYBEAN SEED PROTEIN GENES by Robert B. Goldberg	137
10	EXPRESSION OF α -AMYLASE GENES IN BARLEY ALEURONE CELLS by S. Muthukrishnan and G. R. Chandra	151
11	GENETIC ANALYSIS OF SYMBIOTIC NITROGEN FIXATION GENES by F. M. Ausubel, W. J. Buikema, S. E. Brown, C. D. Earl, S. R. Long, and G. B. Ruvkun	161
12	HOST GENES INVOLVED IN SYMBIOSIS WITH RHIZOBIUM by D. P. S. Verma, J. D. Bewley, S. Auger, F. Fuller, S. Purohit, and P. Kunstner	175
13	VIROID cDNA-USES IN VIROID DETECTION AND MOLECULAR BIOLOGY by Robert A. Owens, Dean E. Cress, and T. O. Diener	185

[five] Genetic Modification

14	GENE VECTORS FOR HIGHER PLANTS by J. Schell, M. Van Montagu, J. P. Hernalsteens, H. DeGreve, J. Leemans, C. Koncz, L. Willmitzer, L. Otten, and J. and G. Schröder	197
15	AGROBACTERIUM-MEDIATED TRANSFER OF FOREIGN GENES INTO PLANTS by J. D. Kemp, D. W. Sutton, C. Fink, R. F. Barker, and T. C. Hall	215
16	MORPHOGENESIS OF TRANSFORMED CELLS FROM OCTOPINE-TYPE CROWN GALL by Lowell Owens and Esra Galun	229
17	MUTATIONS AND CELL SELECTIONS: GENETIC VARIATION FOR IMPROVED PROTEIN IN RICE by Gideon W. Schaeffer and F. T. Sharpe, Jr.	237

[six] New Plants via Tissue Culture

18	HYBRID AND CYBRID PRODUCTION VIA PROTOPLAST FUSION by Edward C. Cocking	257
19	DIHAPLOIDS VIA ANTERS CULTURED IN VITRO by P. S. Baenziger and G. W. Schaeffer	269
20	MORPHOGENESIS AND REGENERATION IN TISSUE CULTURE by Trevor A. Thorpe	285
21	RAPID CLONAL PROPAGATION BY TISSUE CULTURE by Richard H. Zimmerman	305
	Indexes	317