

Advances in Genetics

Edited by

Jeffrey C. Hall

Department of Biology Brandeis University Waltham, Massachusetts

Theodore Friedmann

Center for Molecular Genetics University of California at San Diego School of Medicine La Jolla, California

Jay C. Dunlap

Department of Biochemistry Dartmouth Medical School Hanover, New Hampshire

Francesco Giannelli

Division of Medical and Molecular Genetics United Medical and Dental Schools of Guy's and St. Thomas' Hospitals London Bridge, London United Kingdom



Academic Press

Contents

Contributors vii

1	Mosquito Evolution	Genomes: Structure, Organization, and $oldsymbol{1}$	
	Karamjit	S. Rai and William C. Black IV	
	. I.	Overview 1	
	II.	Mosquito Taxonomy, Evolution, and the Fossil Record	2
	III.	Cladistic Analysis of Culicidae 3	
	IV.	Chromosome Number Is Conserved in Culicidae 5	
	V.	Sex Chromosome Evolution in Culicidae 7	
	VI.	Genome Size and General Genome Organization 7	
	VII.	Heterochromatin: Localization, Variation, and	
		Expression 17	
	VIII.	Saturated Linkage Maps Generated through Multipoint	
		Mapping 23	
	· IX.	Summary 26	
	'	References 27	

2 Seeing the Light: News in *Neurospora* Blue Light Signal Transduction 35

H. Linden, P. Ballario, G. Arpaia, and G. Macino

- I. Introduction 36
- II. The Perception of Light in Neurospora 37
- III. The Interplay of Blue Light and Other Regulatory Pathways in Neurospora 41
- IV. Mutational Analysis of Blue Light Signal Transduction in Neurospora 42
- V. The *Neurospora* Blue Light Regulatory Proteins WC-1 and WC-2 44
- VI. Concluding Remarks 50 References 51

Giovanni Neri and Pietro Chiurazzi I. Introduction 56 II. Syndromal XLMR

3 X-Linked Mental Retardation

III.

	IV.	Conclusion 83 References 83
4	Therapy	eutical Perspectives of Nonviral Gene 95 ahato, Louis C. Smith, and Alain Rolland
		Why a Gene-Based Approach for Protein Therapy? Commercialization of Gene Therapy Products Basic Components of Gene Expression Plasmids Gene Delivery Systems 110 Formulation Factors Influencing Gene Transfer Biodistribution and Pharmacokinetics of Plasmids Intracellular Trafficking of Gene Medicines 130 Biological Opportunities for Gene Therapy 134 Concluding Remarks 143 References 144
5	Function	al Analysis of 23S Ribosomal RNA Structure and In <i>Escherichia coli</i> 157 L. Triman
	I. II. III.	Introduction 157 Methods of Detection of rRNA Mutants in Escherichia coli 158 Mutational Analysis of 23S rRNA Structure and
	IV.	Function 162 Conclusions 169 References 187
	Index	197

55

80

57

Nonsyndromal XLMR (MRX)