

Contents

Preface. v

Contributors. ix

1 Study of Transposable Elements and Their Genomic Impact 1

Martin Muñoz-Lopez, Raquel Vilar-Astasio, Pablo Tristan-Ramos, Cesar Lopez-Ruiz, and Jose L. Garcia-Pérez

2 Bacterial Group II Introns: Identification and Mobility Assay 21

Nicolás Toro, María Dolores Molina-Sánchez, Rafael Nisa-Martínez, Francisco Martínez-Abarca, and Fernando Manuel García-Rodríguez

3 In Silico Methods to Identify Exapted Transposable Element Families 33

LeeAnn Ramsay and Guillaume Bourque

4 Retrotransposon Capture Sequencing (RC-Seq): A Targeted, High-Throughput Approach to Resolve Somatic L1 Retrotransposition in Humans 47

Francisco J. Sanchez-Luque, Sandra R. Richardson, and Geoffrey J. Faulkner

5 Long Interspersed Element Sequencing (L1-Seq): A Method to Identify Somatic LINE-1 Insertions in the Human Genome 79

Tara T. Doucet and Haig H. Kazazian Jr.

6 Combining Amplification Typing of L1 Active Subfamilies (ATLAS) with High-Throughput Sequencing 95

Rabeleh Rahbari and Richard M. Badge

7 RNA-Seq Analysis to Measure the Expression of SINE Retroelements 107

Ángel Carlos Román, Antonio Morales-Hernández, and Pedro M. Fernández-Salguero

8 Qualitative and Quantitative Assays of Transposition and Homologous Recombination of the Retrotransposon Tfl in *Schizosaccharomyces pombe* 117

Maya Sangesland, Angela Atwood-Moore, Sudhir K. Rai, and Henry L. Levin

9 LINE Retrotransposition Assays in *Saccharomyces cerevisiae* 131

Axel V. Horn and Jeffrey S. Han

10 LINE-1 Cultured Cell Retrotransposition Assay 139

Huira C. Kopera, Peter A. Larson, John B. Moldovan, Sandra R. Richardson, Ying Liu, and John V. Moran

11 L1 Retrotransposition in Neural Progenitor Cells 157

Alysson R. Muotri

12 Characterization of Engineered L1 Retrotransposition Events: The Recovery Method 165

David Cano, Santiago Morell, Andres J. Pulgarin, Suyapa Amador, and Jose L. Garcia-Pérez

13	SINE Retrotransposition: Evaluation of Alu Activity and Recovery of De Novo Inserts	183
	<i>Catherine Ade and Astrid M. Roy-Engel</i>	
14	The Engineered SVA <i>Trans</i> -mobilization Assay	203
	<i>Anja Bock and Gerald G. Schumann</i>	
15	Detection of LINE-1 RNAs by Northern Blot	223
	<i>Prescott Deininger and Victoria P. Belancio</i>	
16	Monitoring Long Interspersed Nuclear Element 1 Expression During Mouse Embryonic Stem Cell Differentiation	237
	<i>Maxime Bodak and Constance Ciaudo</i>	
17	Immunodetection of Human LINE-1 Expression in Cultured Cells and Human Tissues	261
	<i>Reema Sharma, Nemanja Rodić, Kathleen H. Burns, and Martin S. Taylor</i>	
18	Cellular Localization of Engineered Human LINE-1 RNA and Proteins	281
	<i>Aurélien J. Doucet, Eugénia Basyuk, and Nicolas Gilbert</i>	
19	Purification of L1-Ribonucleoprotein Particles (L1-RNPs) from Cultured Human Cells	299
	<i>Prabhat K. Mandal and Haig H. Kazazian Jr.</i>	
20	Characterization of L1-Ribonucleoprotein Particles	311
	<i>Martin S. Taylor, John LaCava, Lixin Dai, Paolo Mita, Kathleen H. Burns, Michael P. Rout, and Jef D. Boeke</i>	
21	LEAP: L1 Element Amplification Protocol	339
	<i>Huira C. Kopera, Diane A. Flasch, Mitsuhiro Nakamura, Tomoichiro Miyoshi, Aurélien J. Doucet, and John V. Moran</i>	
22	Biochemical Approaches to Study LINE-1 Reverse Transcriptase Activity In Vitro	357
	<i>Sébastien Viollet, Aurélien J. Doucet, and Gaël Cristofari</i>	
23	Methylated DNA Immunoprecipitation Analysis of Mammalian Endogenous Retroviruses	377
	<i>Rita Rebollo and Dixie L. Mager</i>	
24	Profiling DNA Methylation and Hydroxymethylation at Retrotransposable Elements	387
	<i>Lorenzo de la Rica, Jatinder S. Stanley, and Miguel R. Branco</i>	
25	A Large-Scale Functional Screen to Identify Epigenetic Repressors of Retrotransposon Expression	403
	<i>Gabriela Ecco, Helen M. Rowe, and Didier Trono</i>	
26	Reprogramming of Human Fibroblasts to Induced Pluripotent Stem Cells with <i>Sleeping Beauty</i> Transposon-Based Stable Gene Delivery	419
	<i>Attila Sebe and Zoltán Ivics</i>	
	<i>Index</i>	429