
Contents

<i>Preface</i>	<i>v</i>
<i>Contributors</i>	<i>ix</i>
PART I DETECTION OF MITOCHONDRIAL DNA MUTATIONS AND MITOCHONDRIAL DNA DAMAGE	
1 Comprehensive Mitochondrial Genome Analysis by Massively Parallel Sequencing <i>Meagan E. Palculict, Victor Wei Zhang, Lee-Jun Wong, and Jing Wang</i>	3
2 Analysis of Translesion DNA Synthesis by the Mitochondrial DNA Polymerase γ <i>William C. Copeland, Rajesh Kasiviswanathan, and Matthew J. Longley</i>	19
3 Quantitation of DNA Damage by Real-Time qPCR <i>Wei Wang, Katja Scheffler, Ying Esbensen, and Lars Eide</i>	27
4 Quantitation of Mitochondrial DNA Deletions Via Restriction Digestion/Long-Range Single-Molecule PCR <i>Yevgenya Kravtsov, Xinhong Guo, Saisai Tao, Alexandra Kuznetsov, Catherine McLean, Daniel Ehrlich, Evan Feldman, Igor Dombrovsky, Deyang Yang, Gregory J. Cloutier, Carmen Castaneda-Sceppa, and Konstantin Khrapko</i>	33
PART II VISUALIZATION OF MITOCHONDRIAL DNA AND MITOCHONDRIAL DNA NUCLEOIDS	
5 A Single-Cell Resolution Imaging Protocol of Mitochondrial DNA Dynamics in Physiopathology, mTRIP, Which Also Evaluates Sublethal Cytotoxicity <i>Laurent Chatre, Benjamin Montagne, and Miria Ricchetti</i>	49
6 Scalable Isolation of Mammalian Mitochondria for Nucleic Acid and Nucleoid Analysis <i>Ken-Wing Lee and Daniel F. Bogenhagen</i>	67
7 Tracking Mitochondrial DNA <i>In Situ</i> <i>Anna Ligasová and Karel Koberna</i>	81
PART III ANALYSIS OF MITOCHONDRIAL DNA REPLICATION, MITOCHONDRIAL DNA-ENCODED PROTEIN TRANSLATION AND MITOCHONDRIAL DNA COPY NUMBER	
8 Analysis of Replicating Mitochondrial DNA by <i>In Organello</i> Labeling and Two-Dimensional Agarose Gel Electrophoresis <i>Ian J. Holt, Lawrence Kazak, Aurelio Reyes, and Stuart R. Wood</i>	95

9	Translation and Assembly of Radiolabeled Mitochondrial DNA-Encoded Protein Subunits from Cultured Cells and Isolated Mitochondria	115
	<i>Luke E. Formosa, Annette Hofer, Christin Tischner, Tina Wenz, and Michael T. Ryan</i>	
10	Analysis of Mitochondrial DNA Copy Number and Its Regulation Through DNA Methylation of <i>POLGA</i>	131
	<i>Xin Sun, William Lee, Vijesh Vaghjiani, and Justin C. St. John</i>	
PART IV MODIFICATION OF MITOCHONDRIAL DNA		
11	Engineered mtZFNs for Manipulation of Human Mitochondrial DNA Heteroplasmy	145
	<i>Payam A. Gammage, Lindsey Van Haute, and Michal Minczuk</i>	
12	Generation of Xenomitochondrial Embryonic Stem Cells for the Production of Live Xenomitochondrial Mice	163
	<i>Ian A. Trounce, Jessica Ackersley, and Matthew McKenzie</i>	
13	Import of Fluorescent RNA into Mitochondria of Living Cells	175
	<i>Jaroslav Zelenka and Petr Jeřek</i>	
PART V PURIFICATION OF PROTEINS INVOLVED IN MITOCHONDRIAL DNA REPLICATION AND TRANSCRIPTION		
14	Purification and Comparative Assay of the Human Mitochondrial Replicative DNA Helicase	185
	<i>Fernando A. Rosado-Ruiz, Minyoung So, and Laurie S. Kaguni</i>	
15	Expression and Purification of Mitochondrial RNA Polymerase and Transcription Factor A from <i>Drosophila melanogaster</i>	199
	<i>John P. Gajewski, Jamie J. Arnold, Tiina S. Salminen, Laurie S. Kaguni, and Craig E. Cameron</i>	
16	Purification and Comparative Assay of Human Mitochondrial Single-Stranded DNA-Binding Protein	211
	<i>Grzegorz L. Ciesielski, Fernando A. Rosado-Ruiz, and Laurie S. Kaguni</i>	
17	Biolayer Interferometry: A Novel Method to Elucidate Protein–Protein and Protein–DNA Interactions in the Mitochondrial DNA Replisome.	223
	<i>Grzegorz L. Ciesielski, Vesa P. Hytönen, and Laurie S. Kaguni</i>	
	<i>Index</i>	233



<http://www.springer.com/978-1-4939-3039-5>

Mitochondrial DNA

Methods and Protocols

McKenzie, M. (Ed.)

2016, XI, 234 p., Hardcover

ISBN: 978-1-4939-3039-5

A product of Humana Press