
Contents

Preface	v
Contributors	xi

PART I: ANALYSIS OF DNA ADDUCTS

1 ^{32}P -Postlabeling Analysis of DNA Adducts <i>David H. Phillips, Alan Hewer, and Volker M. Arlt</i>	3
2 Modification of the ^{32}P -Postlabeling Method to Detect a Single Adduct Species as a Single Spot <i>Masako Ochiai, Takashi Sugimura, and Minako Nagao</i>	13
3 DNA Isolation and Sample Preparation for Quantification of Adduct Levels by Accelerator Mass Spectrometry <i>Karen H. Dingley, Esther A. Ubick, John S. Vogel, and Kurt W. Haack</i>	21
4 Fluoroimaging-Based Immunoassay of DNA Photoproducts in Ultraviolet-B-Irradiated Tadpoles <i>Iovanna Pandelova, Stephen R. Hewitt, and John B. Hays</i>	29
5 Analysis of DNA Strand Cleavage at Abasic Sites <i>Walter A. Deutsch and Vijay Hegde</i>	39

PART II: DETECTION OF CHROMOSOMAL AND GENOME-WIDE DAMAGE

6 Premature Chromosome Condensation in Human Resting Peripheral Blood Lymphocytes for Chromosome Aberration Analysis Using Specific Whole-Chromosome DNA Hybridization Probes <i>Pataje G. S. Prasanna and William F. Blakely</i>	49
7 Mutagen-Induced Chromatid Breakage as a Marker of Cancer Risk <i>Xifeng Wu, Yun-Ling Zheng, and T. C. Hsu</i>	59
8 Flow Cytometric Analysis of Micronuclei in Erythrocytes <i>Jan Grawé</i>	69
9 The Comet Assay: A Sensitive Genotoxicity Test for the Detection of DNA Damage <i>Günter Speit and Andreas Hartmann</i>	85
10 Computerized Image Analysis Software for the Comet Assay <i>R. C. Chaubey</i>	97

11	The Comet-FISH Technique: A Tool for Detection of Specific DNA Damage and Repair <i>Alexander Rapp, Michael Hausmann, and Karl Otto Greulich</i>	107
12	DNA Double-Strand Break Damage and Repair Assessed by Pulsed-Field Gel Electrophoresis <i>Nina Joshi and Stephen G. Grant</i>	121
PART III: DETECTION AND CHARACTERIZATION OF SURROGATE GENE MUTATION		
13	Analysis of In Vivo Mutation in the <i>Hprt</i> and <i>Tk</i> Genes of Mouse Lymphocytes <i>Vasily N. Dobrovolsky, Joseph G. Shaddock, and Robert H. Heflich</i>	133
14	Quantifying In Vivo Somatic Mutations Using Transgenic Mouse Model Systems <i>Roy R. Swiger</i>	145
15	Methods for Detecting Somatic Mutations In Vitro: <i>The Human T-Cell Cloning Assay Selecting for HPRT Mutants</i> <i>Sai-Mei Hou</i>	155
16	Molecular Analysis of Mutations in the Human <i>HPRT</i> Gene <i>Phouthone Keohavong, Liqiang Xi, and Stephen G. Grant</i>	161
17	Simultaneous Quantification of t(14;18) and <i>HPRT</i> Exon 2/3 Deletions in Human Lymphocytes <i>James C. Fuscoe</i>	171
18	The <i>GPA</i> In Vivo Somatic Mutation Assay <i>Stephen G. Grant</i>	179
19	Flow Cytometric Measurement of Mutant T Cells With Altered Expression of <i>TCR</i> : <i>Detecting Somatic Mutations in Humans and Mice</i> <i>Seishi Kyoizumi, Yoichiro Kusunoki, and Tomonori Hayashi</i>	197
PART IV: DETECTION AND CHARACTERIZATION OF CANCER GENE MUTATION		
20	Mutation Screening of the <i>TP53</i> Gene by Temporal Temperature Gradient Gel Electrophoresis <i>Therese Sørlie, Hilde Johnsen, Phuong Vu, Guro Elisabeth Lind, Ragnhild Lothe, and Anne-Lise Børresen-Dale</i>	207
21	Analysis of K-RAS and <i>P53</i> Mutations in Sputum Samples <i>Weimin Gao and Phouthone Keohavong</i>	217
22	Allele-Specific Competitive Blocker-PCR Detection of Rare Base Substitution <i>Barbara L. Parsons, Page B. McKinzie, and Robert H. Heflich</i>	235

- 23 Gel-Based Nonradioactive Single-Strand Conformational Polymorphism and Mutation Detection: *Limitations and Solutions*
Vibhuti Gupta, Reetakshi Arora, Anand Ranjan, Narendra K. Bairwa, Dheeraj K. Malhotra, P. T. Udhayasuriyan, Anjana Saha, and Ramesh Bamezai 247
- 24 Detection and Characterization of Oncogene Mutations in Preneoplastic and Early Neoplastic Lesions
Toshinari Minamoto 263
- 25 Detection of DNA Double-Strand Breaks and Chromosome Translocations Using Ligation-Mediated PCR and Inverse PCR
Michael J. Villalobos, Christopher J. Betti, and Andrew T. M. Vaughan 279

PART V: ANALYSIS OF DNA REPAIR MECHANISMS

- 26 Microsatellite Instability: *An Indirect Assay to Detect Defects in the Cellular Mismatch Repair Machinery*
Anjana Saha, Narendra K. Bairwa, and Ramesh Bamezai 293
- 27 Unscheduled DNA Synthesis: *A Functional Assay for Global Genomic Nucleotide Excision Repair*
Crystal M. Kelly and Jean J. Latimer 303
- 28 Analysis of DNA Repair Using Transfection-Based Host Cell Reactivation
Jennifer M. Johnson and Jean J. Latimer 321
- 29 An Immunoassay for Measuring Repair of Ultraviolet Photoproducts
Shirley McCready 337
- 30 Analysis of DNA Double-Strand Break Repair by Nonhomologous End Joining in Cell-Free Extracts From Mammalian Cells
Petra Pfeiffer, Elke Feldmann, Andrea Odersky, Steffi Kuhfittig-Kulle, and Wolfgang Goedecke 351
- 31 Measuring Recombination Proficiency in Mouse Embryonic Stem Cells
Andrew J. Pierce and Maria Jasín 373

PART VI: ARRAY TECHNOLOGIES

- 32 Strategies for Measurement of Biotransformation Enzyme Gene Expression
Marjorie Romkes and Shama C. Buch 387
- 33 Genotyping Technologies: *Application to Biotransformation Enzyme Genetic Polymorphism Screening*
Marjorie Romkes and Shama C. Buch 399

- 34 TaqMan® Fluorogenic Detection System
to Analyze Gene Transcription in Autopsy Material
Kaori Shintani-Ishida, Bao-Li Zhu, and Hitoshi Maeda 415
- 35 Development of Quantitative Reverse Transcriptase PCR Assays
for Measuring Gene Expression
Tony E. Godfrey and Lori A. Kelly 423

PART VII: APOPTOSIS

- 36 Quantification of Selective Phosphatidylserine Oxidation
During Apoptosis
***James P. Fabisiak, Yulia Y. Tyurina, Vladimir A. Tyurin,
and Valerian E. Kagan 449***
- 37 Quantitative Method of Measuring Phosphatidylserine
Externalization During Apoptosis Using Electron Paramagnetic
Resonance Spectroscopy and Annexin-Conjugated Iron
James P. Fabisiak, Grigory G. Borisenko, and Valerian E. Kagan..... 457
- 38 Detection of Programmed Cell Death in Cells Exposed
to Genotoxic Agents Using a Caspase Activation Assay
Michael E. Gehring and Patrick P. Koty 465

- Index 473



<http://www.springer.com/978-1-58829-084-7>

Molecular Toxicology Protocols

Keohavong, P.; Grant, S.G. (Eds.)

2005, XIV, 489 p., Hardcover

ISBN: 978-1-58829-084-7

A product of Humana Press