

Contents

Preface

v

I. General and Cellular Aspects

1. **Apoptotic Pathways in Mitochondria** 3
Ozgur Kutuk and Huveyda Basaga
2. **Human Genetic Defects in Apoptosis Pathways and Processes** 19
Jeremiah C. Davis and Helen C. Su
3. **Polyphenols and Apoptosis** 37
Claudio Giovannini, Beatrice Scazzocchio, Rosaria Vari and Roberta Masella
4. **How Caspase Proteases Regulate Cell Fate** 55
Carol Evans and Lynn Megeney
5. **Role of Calpain in Apoptotic Process Involved in Neurodegenerative Diseases** 73
Natalia Crespo-Biel, Anna M. Canudas, Antoni Camins and Mercè Pallàs
6. **TNF-related Apoptosis-inducing Ligand (TRAIL)** 87
Simone Fulda
7. **The Role of Endoplasmic Reticulum (ER) Stress in Mediating the Apoptotic Effect of Selenium Compounds** 99
Hidemi Rikiishi and Maiko Suzuki
8. **Nuclear Steroid Receptors in Apoptosis** 115
Joana D. Amaral, Susana Solá, Clifford J. Steer and Cecília M.P. Rodrigues
9. **Mitochondrial Morphological Dynamics in Apoptosis** 133
Craig Brooks and Zheng Dong
10. **Apoptotic Cell Uptake and Degradation** 149
Leanne E. Lewis, Judith M. Bain and Lars-Peter Erwig

II. Metabolic and Organ Specific Diseases

11. Apoptosis in Skeletal Muscle Health and Conditions of Muscle Wasting 167
Stephen E. Alway
12. Apoptosis in the Spinal Column — Its Understanding will Help Develop Strategies for the Treatment of Chronic Back Pain 183
Ashish D. Diwan
13. Apoptosis in the Liver 199
Ying-Hong Shi, Jia Fan, Zhen-Bin Ding and Xiao-Ming Yin
14. Apoptosis in Alcoholic Liver Disease 215
D. Gyamfi, H.E. Everitt and V.B. Patel
15. Pancreatic Beta-Cell Apoptosis 229
Dan S. Luciani and James D. Johnson
16. Oxidative Stress and Apoptosis 245
J.M. Matés, J.A. Segura, F.J. Alonso and J. Márquez

III. Cancer

17. Apoptosis in Lung Cancer 263
Shou Wei Han and Jesse Roman
18. Inhibition of Apoptosis in Leukemia: BCR-ABL Induced Leukemogenesis 277
Rajan Dewar and Roya Khosravi-Far
19. Apoptosis in Prostate Cancer 293
Zongwei Wang, Rongbin Ge and Aria F. Olumi
20. Apoptosis and Colorectal Cancer 311
Shirish G. Prabhudesai, Greta Roberts and Paul Ziprin

IV. Cardiovascular and Pulmonary Tissue

21. Apoptosis and Vascular Disease 327
Vyacheslav A. Korshunov
22. Apoptosis in Coronary Artery Disease and Reperfusion Injury: Detection, Non-cardiomyocytes and Therapeutic Strategies 341
D. Tousoulis, A. Briasoulis, C. Antoniades and C. Stefanadis
23. Potassium Channels and Apoptosis: Application to Pulmonary Vascular Disease 357
Amy L. Firth, Amanda White and Jason X-J. Yuan

24. Molecular Regulation of Apoptosis Signaling Pathways in Heart	373
<i>Rimpy Dhingra, James Shaw and Lorrie A. Kirshenbaum</i>	
25. Potential Exercise Mitigation and Regulation of Age-induced Apoptosis and Remodeling in the Heart	389
<i>John M. Lawler and Hyo-Bum Kwak</i>	
26. Apoptosis in Asthma	405
<i>Fernando Maria de Benedictis, Diletta de Benedictis and Fabrizio Spinozzi</i>	
27. Apoptosis in Lung Diseases	421
<i>Kazuyoshi Kuwano, Katsutoshi Nakayama and Jun Araya</i>	
V. Neuronal Tissues	
28. Apoptotic Mechanisms Involved in Neurological Disorders	439
<i>Anna Maria Colangelo and Lilia Alberghina</i>	
29. Apoptosis Signaling Pathways, Neuronal Death and Epilepsy	457
<i>David C. Henshall</i>	
30. Apoptotic Mechanisms in Multiple Sclerosis: Diagnostic and Therapeutic Opportunities	473
<i>Andrea L.O. Hebb, Craig S. Moore, Virender Bhan and George S. Robertson</i>	
VI. Immunologic and Infectious Aspects	
31. Neutrophil Apoptosis and Its Involvement in Inflammation and Infection	489
<i>Fabien Loison and Hongbo R. Luo</i>	
32. Apoptosis in HIV/AIDS	507
<i>Andrea Cossarizza</i>	
33. Apoptosis in Immunosenescence	521
<i>Lia Ginaldi and Massimo De Martinis</i>	
34. Apoptosis in Autoimmunity	535
<i>Eleni Maniati, Nicola J. Rogers and Bernard J. Morley</i>	
35. Apoptosis in Lupus	551
<i>Kerstin Sarter, Connie Schulze, Christina Janko, Christine Schorn, Luis Munoz and Martin Herrmann</i>	

VII. Inhibitors

- | | |
|--|------------|
| 36. The Bax Inhibitor-1 (BI-1) Family in Apoptosis | 567 |
| <i>Kerstin Reimers and Peter M. Vogt</i> | |
| 37. Targeting Inhibitor of Apoptosis (IAP) Proteins in Cancer | 583 |
| <i>Eugene Varfolomeev and Domagoj Vucic</i> | |

VIII. Methods

- | | |
|---|------------|
| 38. Morphological and Cytochemical Methods for the Identification of Cell Death by Apoptosis | 603 |
| <i>Douglas J. Taatjes, Marilyn P. Wadsworth and Burton E. Sobel</i> | |
| 39. Quantification of Apoptosis | 621 |
| <i>Glenda Gobe and Clay Winterford</i> | |
| 40. Proteomic Screening in Apoptosis | 635 |
| <i>Grégory Tufo, Cécile Martel, Gwenaël Jan and Catherine Brenner</i> | |
| <i>Index</i> | 649 |
| <i>About the Editor</i> | 655 |
| <i>Color Plate Section</i> | 657 |