

Preface to Second Edition

The first edition of this book was published in 2003. It was intended to provide the basic and essential information of apoptosis for those who were new to the field and who wanted to apply the knowledge to their own research. The book therefore focused on the concepts, the basic molecular architecture, and the pathophysiological significance of apoptosis. Since the first edition, there have been tremendous new developments in the field of apoptosis and cell death in general. The concept of various types of cell death has been further developed. The studies in both basic and clinical disciplines have been greatly expanded. In particular, notable progress has been made in extending the work into the therapeutic arena. As a result, the field has matured considerably and developed extensive cross-talk with works in other fields.

We strive to incorporate and reflect these new developments in the second edition of this book. Our goal is to provide readers with the most updated and advanced knowledge in the field, while maintaining the fundamental information as presented in the first edition. To this end, the book has been significantly expanded, not only in the page and chapter numbers but more importantly in the depth of coverage. Most of the chapters have been revised and/or rewritten, and 15 new chapters have been added to give rise to a total of 31 chapters. In Part I, in addition to the discussion of the major apoptosis molecules, the activation and regulatory pathways, and the clearance of apoptotic cells, we also present important issues that examine apoptosis from more integrated points of view. Thus, the roles of reactive oxygen species, metabolism, and transcription control in apoptosis activation and regulation are explored. A new systems biology approach to studying apoptosis is also introduced. In Part II, we discuss apoptosis and cell death in four model systems, including plant, yeast, *C. elegans*, and *Drosophila*, which together have contributed greatly to our current understanding of cell death. In Part III, we focus on mammalian cell death under various pathophysiological situations in all major systems, including the hematopoietic and immune system, the brain, the heart, the liver, the lung, and the kidney. Two integrated chapters discussing cell death in normal development and in cancer biology have also been included. Furthermore, a separate Part IV has been added to discuss the alternative mechanisms and pathways of cell death. Finally, Part V discusses the technical aspect of apoptosis

research. This new edition should be valuable for both novice and seasoned investigators as a comprehensive reference as well as a practical guide.

As broad as the content to which they have contributed, our more than 80 contributors come from across the world, representing institutes from 15 countries and regions. We would like to acknowledge the hard work by all the authors, who are recognized experts and leaders in the field of apoptosis research. Without their dedicated contributions, this book would not have been possible. We are also especially grateful to our families for their wholehearted and enduring support, which makes the edition of this book very rewarding and enjoyable. Finally, we wish to dedicate this edition to the memory of Dr. Stanley J. Korsmeyer (1950–2005), a beloved mentor, colleague, and friend. Dr. Korsmeyer was a pioneer and a visionary in the field of apoptosis. His seminal works on the Bcl-2 family proteins, on the mitochondria and endoplasmic reticulum pathways of apoptosis activation and regulation, and on the pathophysiological significance of apoptosis in embryonic development, in immune response, and in cancer biology and cancer therapy tremendously changed and advanced the field. He will be remembered by all of us.

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