PREFACE

Cell turnover is a fundamental feature of metazoan biology. Severe damage to cellular integrity usually causes passive, nonregulated cell death. In contrast, more confined disruption can lead to more deliberate cell elimination, through specific mechanisms of Regulated Cell Death. In these two volumes of *Methods in Enzymology*, we aim to highlight the current molecular understanding of the major processes of Regulated Cell Death and to illustrate basic and advanced methodologies to study them. Volume A focuses on the most extensively studied mode of cell death—apoptosis. Volume B covers several nonapoptotic mechanisms. These include necroptosis, which shares certain signal transduction aspects with apoptosis but is unique in its execution phase, and autophagic cell death, which is an offshoot of autophagy—a more basic prosurvival metabolic adaptation mechanism. Chapters 1–4 cover how to measure necroptosis and various molecular components and complexes that signal this process. Chapter 5 discusses approaches to interrogating interactions between tumor necrosis factor superfamily ligands and receptors. Chapters 6–8 highlight nonapoptotic cell death mechanisms in the model organisms, *C. elegans* and *D. melanogaster*. Chapters 9 and 10 discuss structural aspects of death receptor complexes and strategies to study posttranslational modification of downstream signaling components by RING E3 ubiquitin ligases. Finally, Chapter 11 describes a multidimensional profiling approach to studying small-molecule-induced cell death. We hope these chapters will be both conceptually informative and practically useful for readers interested in the current understanding and the key open questions in each area, as well as in experimental strategies and techniques to interrogate nonapoptotic regulated cell death mechanisms.

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