Preface

Since the release of the first edition of this book in 2008, Pubmed has banked more than 100,000 scientific publications on apoptosis and more than 50,000 articles on apoptosis and cancer—and these numbers are continuing to increase. In the past few decades, the focus has been to delineate the cascade of steps eventually leading to cell death with the objective of identifying the key regulators. As these pathways are catalogued and specific key proteins are identified, most recent studies have been involved in the identification of either inhibitors of apoptosis (i.e., for prevention of cardiac cell death or neuronal cell death following hypoxic stress) or inducers of apoptosis (i.e., for cancer therapy). Whichever clinical application is intended, a mainstay of the studies has been the demonstration of apoptosis induction. This can be achieved, however, only if sensitive and specific assays are available.

Thus, the aim of this book has not changed. It is still a detailed reference for the performance of molecular and cellular biology techniques for studying and/or detecting the activation of the apoptotic pathway, especially in the study of cancer. Resistance to apoptosis has been defined as one of the hallmarks of cancer and has been demonstrated to play a major role in chemoresistance. More recently, with the demonstration of hierarchy within the cancer cell subtypes that make up the tumor, focus has turned to understanding the mechanism/s of apoptosis evasion in the tumor-initiating cells or cancer stem cells. The demonstration that this cell population represents the more chemoresistant subtype is a first step in understanding the different mechanisms that are in place to evade apoptosis within the heterogeneous tumor.

This book remains a combination of chapters authored by scientists from both industry and academia. In addition, as the field of apoptosis has grown in the past years, new assays have been developed to detect its activation not only in vitro but also in vivo. Assays have also been developed, which are optimized for multiplex analysis and medium- to high-throughput screens. Finally, since cell death can be a culmination of various pathways, this book also includes chapters that focus on cellular processes that can contribute to programmed cell death, such as autophagy and proteasome activation.

We wish to thank all the authors for their contributions and we are confident that each chapter will be an excellent reference for any laboratory. We also wish to thank Ms. JoAnn Bilyard for her help in sending out invitations to prospective authors and in the organization of this book. Finally, special thanks to our Series Editor, Dr. John Walker.

We hope that each chapter provides investigators with a stand-alone resource for the execution and analysis of the described protocols and that the book will provide an excellent reference for the study and detection of apoptosis within and even outside the area of cancer research.

New Haven, CT, USA

Gil Mor, M.D., Ph.D.
Ayesha B. Alvero, M.D.

http://www.springer.com/978-1-4939-1660-3

Apoptosis and Cancer
Methods and Protocols
Mor, G.; Alvero, A. (Eds.)
2015, XI, 208 p. 70 illus., 40 illus. in color., Hardcover
ISBN: 978-1-4939-1660-3
A product of Humana Press