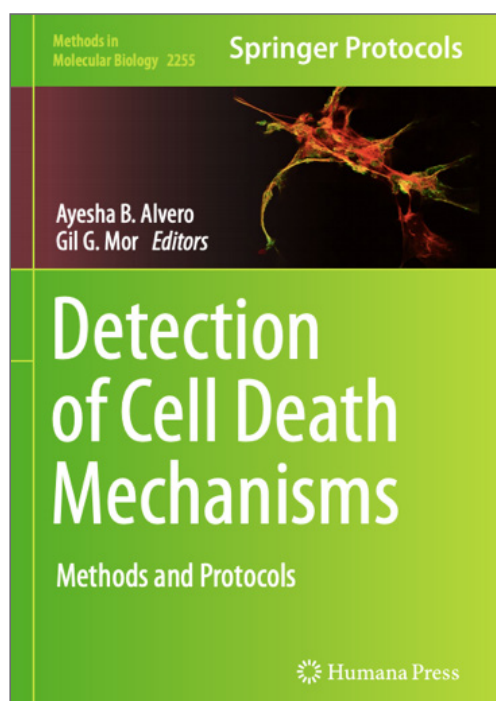


Detection of Cell Death Mechanisms: Methods and Protocols

Erdenezaya Odkhuu

Department of Anatomy, School of Biomedicine, Mongolian National University of Medical Sciences, Ulaanbaatar, Mongolia



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Email: erdenezaya@mnums.edu.mn

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Is apoptosis friend or foe? If your research focused on this question, you might have to answer many questions as "Has a candidate reagent chemical toxicity or apoptosis-inducer effect?", "Why and how did the cell die?" and "What are new and efficient methods being used in vitro cancer research?" etc. In these situations, see familiar to you, this book is for you.

Detection of Cell Death Mechanisms: Methods and Protocols is one of the newest volumes of the Methods in Molecular Biology series belonging to the SpringerLink platform and published by Humana Press as a hard copy. The Methods in Molecular Biology series provides step-by-step instructions for carrying out experiments in a research laboratory. These hallmark features were first introduced by series editor Dr. John Walker in 1983 and have been tested and proven comprehensive and reliable.

This new volume was written by over 40 expert researchers in the field and details the performance of molecular and cellular biology techniques for studying and detecting the activation of the apoptotic pathway. The volume was edited by Dr. Ayesha B. Alvero and her college professor Gil G. Mor (Department of Obstetrics and Gynecology, Wayne State University (Detroit, MI, USA). The editors previously edited other volumes of this series as Apoptosis and Cancer 1st and 2nd edition. This volume compiles both conventional methods (immunoblotting, PCR, etc.) and the highest level of technique as state-of-the-art (TEM, real-time multiplexed imaging assays, etc.) methodologies for the detection of cell death and, more importantly, for the determination of the types of cell death. The authors aim to ensure seamless execution of protocols on specific cell death types.

This edition consists of 20 chapters and is written in the highly successful Methods in Molecular Biology series format as each chapter includes the Abstract, Introduction, Materials, Methods, Notes, and References. An introduction briefly explains the background and the principles of the assays, including clear illustrations. In the section Materials, the authors have listed the total of the equipment, materials, and reagents needed to complete the experiment. Each list includes both "homemade" buffers with a recipe and specialized commercially available reagents. Moreover, readily available systems such as

common human and mouse cell lines and commercially available cell death inducers, which can serve as robust positive controls for the assays, are described. This is followed by the Methods section, a detailed step-by-step, readily reproducible laboratory protocols according to the chapter topic. The Notes section offers key tips, avoiding known pitfalls, and troubleshooting advice, representing the authors' collective experience in the execution of their protocols. At the end of each chapter, the references are all indexed in PubMed with their hyperlinks.

Each chapter is written for both the expert and non-expert reader such that students, trainees, and even experienced scientists who are beginning to look into cell death mechanisms will be able to execute the methodologies described swiftly.

Benedito A. Carneiro (Nature Reviews-Clinical Oncology, 2020) noted that a primary goal of cancer and oncology research has been the development of therapies promoting the effective elimination of cancer cells by apoptosis. Last three decades, research on apoptosis and cancer area is increased progressively; even last year, more than 17000 articles were published in this field. Today, some well-known anticancer agents directly target apoptotic pathways, such as those designed to inhibit anti-apoptotic BCL-2 family members. Other promising therapeutic strategies for activating apoptosis in cancer cells include agents that trigger the apoptosis pathway. A programmed cell death process

is mediated by several signaling pathways (referred to as intrinsic and extrinsic) triggered by multiple factors. The clinical translation of effective pro-apoptotic agents involves drug discovery studies as well as an understanding of tumor biology. A recent decline in new drug development has led to the reawakening of traditional herbal sources. Medicinal plants comprise complex phytochemicals due to their vast biosynthetic capacity. These phytochemicals target cancer at various sites such as apoptotic pathways and other broad range effects.

Mongolian medicine has used numerous natural compounds, including plants and minerals, for cancer treatments. However, researchers need to explore the mechanism of action of traditional medicines at a cellular level and share their findings with other scientists worldwide. Biomedical scientists who do similar research have come to rely on the research protocols and methodologies in the critically acclaimed *Methods in Molecular Biology* series. Authoritative and practical, this new volume aids scientists as a stand-alone resource for the execution and analysis of the described protocols and as a reference for the study and detection of apoptosis within and outside the area of cancer research. I hope *Detection of Cell Death Mechanisms: Methods and Protocols* supports and becomes your guidebook for cancer and apoptosis research in cellular biology.