

Mitochondria and Cell Death

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It is difficult to believe that mitochondria, the powerhouses of cellular life, are also the motors of cell death. Few would have accepted this 5 years ago but it is now one of the hottest topics in biomedical research. This book reviews the role of mitochondria in cell death and disease through a series of clear and comprehensive chapters which present the latest research and thinking on the subject from some of the key researchers in the field. Several different lines of research have converged on the mitochondrion and its role in cell death, including mitochondrial permeability transition, apoptosis, neurodegeneration and excitotoxicity, mitochondrial DNA diseases, free radicals and nitric oxide and hypoxia/ischaemia. This volume will help to unravel these complex multiple interactions, as well as to stimulate further breakthroughs in this exciting field. It contains essential reading for researchers and postgraduates in all areas of biology and medical science.

Front cover illustration shows a three-dimensional reconstruction obtained from confocal images of both red and green emissions of the mitochondrial dye, JC1, from a 4 μm slice of a cultured hippocampal neuron below the level of the nucleus. Each 0.18 μm slice was low-pass filtered in the Fourier domain, prior to Wallis filtering to distinguish mitochondrial staining from the local cytoplasmic background. Note the small connecting structures that link individual mitochondria. The red staining mitochondria are more highly polarized, forming a small subset of the somal mitochondria. Mitochondria from neurites that traverse the field are also visible. Photograph courtesy of Janet Dubinsky.

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