

Preface

Oxidants may serve as cellular messengers. Changes in oxidoreductive or redox status in the cell regulate several signal transduction pathways. Redox-sensitive changes in signal transduction processes translate to functional changes at the cellular, tissue, as well as organ levels.

Redox changes in biological cells, tissues, and organs are often transient. For years, investigators have been challenged by the lack of reliable techniques to assess such changes in intact biological samples. Only recently have novel cell biology and genetic techniques to visualize and document redox changes in intact cells become available. Unlike biochemical methods that rely on the study of biological extracts, these cell biology- and genetics-related techniques arrest transient redox changes in the intact cell, tissues, and even organs. Technologies dependent on laser illumination, advanced spectroscopy, DNA microarray, and related approaches allow visualization of redox changes in the intact biological sample. Such approaches, including but not limited to redox imaging of intact organs, gene therapy, gene screening, flow cytometry, and advanced microscopy, represent the "cutting-edge" technology currently available to only select laboratories.

Our objective was to compile detailed protocols describing and critiquing essential methods in the field of redox cell biology and genetics. Redox Cell Biology and Genetics, Parts A and B, Volumes 352 and 353 of *Methods in Enzymology*, feature a diverse collection of novel cell biology and genetic protocols authored by highly recognized leaders in the field. Part A covers cellular responses and tissues and organs; Part B covers structure and functions of proteins and nucleic acids and genes.

The excellent editorial assistance of Dr. Savita Khanna and the outstanding contributions of the authors are gratefully acknowledged. We hope that this volume will contribute to the further development of this important field of biomedical research.

CHANDAN K. SEN
LESTER PACKER