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Signal Transduction Protocols

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Preface

Signal transduction is the process whereby a physical or chemical stimulus in the extracellular environment is detected by a receptor on the plasma membrane or in the cytosol or nucleus of a sensitive cell and translated into a chemical or electrochemical signal that produces a change in cellular metabolism. Rather than representing a series of simple linear cascades, it is increasingly clear that signal transduction is a highly organized and integrated process. Extensive crosstalk between signaling cascades, communicated directly through receptor oligomerization or indirectly through the activation of autocrine and paracrine feedback loops, enables one type of receptor to modulate activity in multiple intracellular pathways. Additional factors impose spatial or temporal constraints on signaling that influence the final cellular response by determining where within the cell, and for how long, the signal persists.

This volume focuses on experimental approaches to understand the complexity of signal transduction. Introductory chapters have been included to provide perspective on several of the challenges in signal transduction research and guidance on selecting the best approaches to various types of questions. The individual chapters provide detailed experimental protocols, beginning with the effects of ligand binding on receptor conformation and effector coupling, then moving inside the cell to capture the spatial and temporal characteristics of signaling events.

We would like to express our deepest appreciation to the coauthors of this publication. We hope that *Signal Transduction Protocols – Third Edition* will prove to be a valuable resource for future progress in the field of signal transduction research.

Charleston, SC
London, ON

Louis M. Luttrell
Stephen S.G. Ferguson

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