# Table of Contents

## Part I: Antibodies as a Tool: From Concept to Design and Application

1. Overview of the Generation, Validation, and Application of Phosphosite-Specific Antibodies
   - Kathy Brumbaugh, Wade Johnson, Wen-Chieh Liao, Mong-Shang Lin, J. P. Houchins, Jeff Cooper, Steven Stoesz, and Roberto Campos-Gonzalez
   - 3

2. Selection and Validation of Antibodies for Signal Transduction Immunohistochemistry
   - Jenky Booh and Eris D. Man
   - 3

3. An Overview of Western Blotting for Determining Antibody Specificities for Immunohistochemistry
   - Ki-Ji T. Huriae, Vhami Dovrai, Suyler Dillon, Anta Demou, and R. Ral Scfield
   - 3

4. Optimized Protocol to Make Phospho-Specific Antibodies that Work
   - Amy J. Archuleta, Crystal A. Stutzke, Kristin M. Nixon, and Michael D. Browning
   - 3

## Part II: Preservation and Unmasking of Tissue Antigens

5. Methodology and Technology for Stabilization of Specific States of Signal Transduction Proteins
   - Mats Borén
   - 3

6. An Enhanced Antigen Retrieval Protocol for Immunohistochemical Staining of Formalin-Fixed, Paraffin-Embedded Tissues
   - Sergei I. Syrbu and Michael B. Cohen
   - 3

## Part III: Imaging Techniques and High-Throughput Data Analysis

7. Imaging Techniques in Signal Transduction IHC
   - Jerry Sedgewick
   - 3

8. Practical Considerations of Image Analysis and Quantification of Signal Transduction IHC Staining
   - Michael Grunkin, Jakob Raundahl, and Niels T. Foged
   - 3

9. Flow Cytometric Analysis of Cell Signaling Proteins
   - Maria A. Gna and Wesson C. Mann
   - 3

10. CytoSys: A Tool for Extracting Cell Cycle-Related Expression Dynamics from Static Data
    - Jayant Avva, Michael C. Weis, Radina P. Soebiyanto, James W. Jacobberger, and Sree N. Sreenath
    - 3

## Part IV: Neuroscience, Cancer, and Stem Cell Research

11. Signaling Events Initiated by Kappa Opioid Receptor Activation: Quantification and Immunolocalization Using Phospho-Selective KOR, p38-MAPK, and KIR3.1 Antibodies
    - Julia C. Lemos, Clarisse Roth, and Charles Chavkin
    - 3

12. Immunohistochemical Assessment of Signal Transduction and Cell-Cycle Networks in Neural Tumors
    - Daniel Craciunescu, Afsar Barlas, and Katia Manova
    - 3

13. Novel Multi-Color Immunofluorescence Technique Using Primary Antibodies Raised in the Same Host Species
    - Jillian Frisch, P.R. Mouzakis, Michael Grahek, Jordan Schoephoerster, Joni Hayes, Joseph Sweert, Maria Dondino, David Schwartz, and Alexander E. Kalyuzhny
    - 3

14. Activation and Differentiation of Mesenchymal Stem Cells
    - Pravin J. Mishra and Debabrata Banerjee
    - 3

## Part V: Novel Assays and Techniques

15. Double In situ Detection of Sonic Hedgehog mRNA and pMAPK Protein in Examining the Cell Proliferation Signaling Pathway in Mouse Embryo
    - Sho Fujisawa, Mesruh Turkekul, Afsar Barlas, Ping Pan, and Katia Manova
    - 3

    - Christianne Bandeira-Melo, Peter F. Weller, and Patricia T. Bozza
    - 3

17. Adsorption Control in Immunohistochemistry Using Phospho-Lipid-Immunobilized on Magnetic Beads
    - Jordan Schoephoerster, Jillian Frisch, Michael Grahek, Chun Wu, Yingwei He, Wei Wang, Jennifer Nguyen, David Schwartz, and Alexander E. Kalyuzhny
    - 3