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## Preface

Immunohistochemistry (IHC) is one the most valuable research and diagnostic tools in biomedical research. Unlike detecting constitutively expressed targets, immunohistochemical detection of labile, low abundance, and short-lived signal transduction molecules appears to be a very challenging task. This book represents a set of detailed protocols written by IHC experts addressing the challenges of signal transduction immunohistochemistry (ST-IHC); because it would be fair to say that ST-IHC as a discipline is in its infancy and the chapters in the first part are of a more introductory nature which should help new investigators in their orientation in the field. The second part is dedicated to techniques used for the preservation of antigens and their unmasking. The third part presents protocols in digital imaging and image analysis of stained cells and tissues and high-throughput data collection and data analysis. The fourth part is focused on ST-IHC techniques used in neuroscience as well as cancer and stem cell research. And finally, the fifth part presents novel ST-IHC techniques that can be easily adopted for a wide variety of research tasks. This book can be used as a guide by novices and has a wealth of ideas that can be exploited by experienced researchers who are always on the lookout for new experimental tricks and hints. It can also serve as a troubleshooting guide for researchers in academia and in industry.

I wish to thank all the authors who, in addition to their own research projects, devoted a lot of time working on book chapters. In addition, I wish to thank R&D Systems, Inc., where I run the IHC department, for their support and for giving me the opportunity to gain invaluable IHC experience by validating thousands of antibodies over the years.

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