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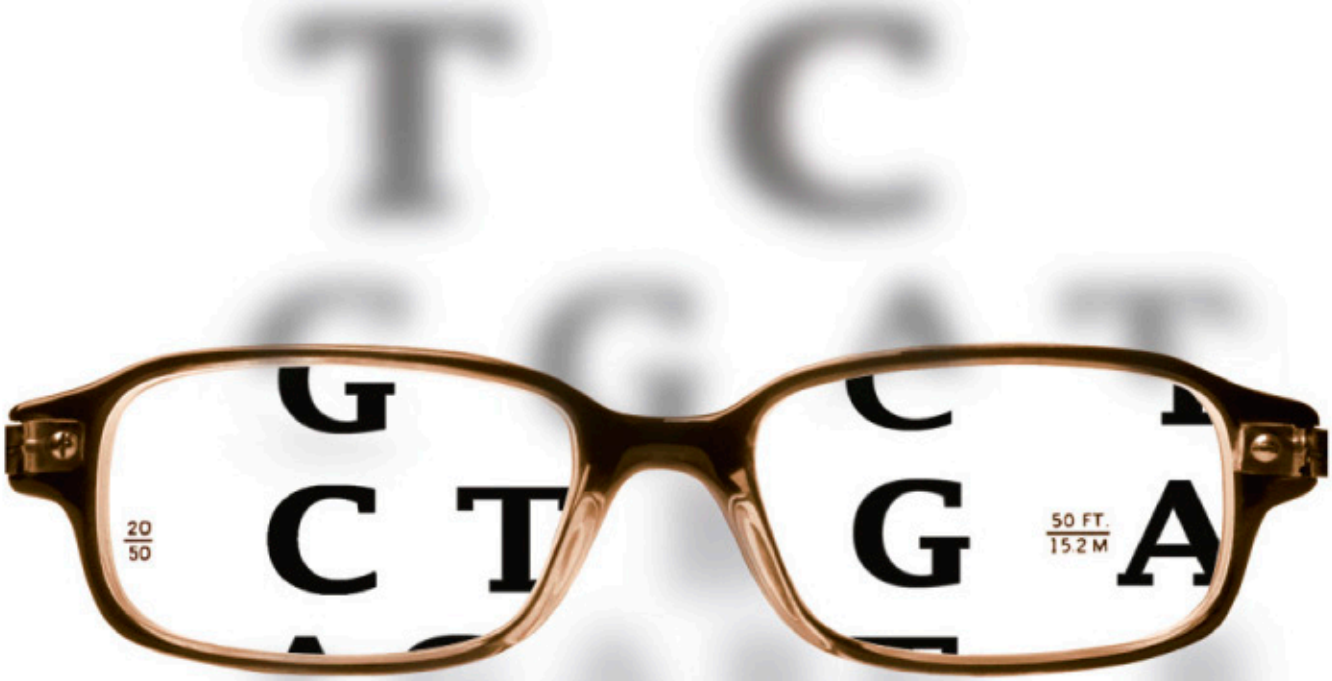

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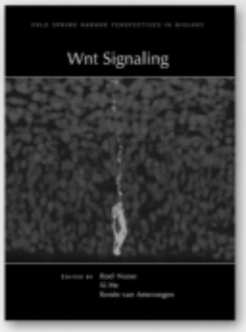
Wnt Signaling

Edited by Roel Nusse, *Stanford University Medical Center,* Xi He, *Children's Hospital Boston,* and Renée van Amerongen, *Stanford University Medical Center*



Wnt proteins are signaling molecules that play critical roles during embryonic development and in the regeneration of adult tissues. They bind to Frizzled and LRP family receptors on the cell surface, triggering a series of events that cause β-catenin to enter the nucleus and activate transcription factors that control cell fate and cell proliferation. Mutations in components of the Wnt pathway lead to developmental defects and are common in cancer.

Written and edited by experts in the field, this collection from *Cold Spring Harbor Perspectives in Biology* covers all aspects of canonical Wnt signaling, as well as β-catenin-independent Wnt signaling and cross-talk with other pathways. The contributors examine the numerous Wnt ligands; their production, secretion, and interactions with components of the extracellular environment; and details of the downstream signaling pathways that mediate the effects of Wnt proteins on cells. The roles of Wnt signaling in stem cell self-renewal, cell polarity, body-axis specification, wound healing, and other aspects of normal development and physiology are also covered.

This volume includes discussion of Wnt signaling in cancer, skeletal defects, neurological disorders, and other human disease states. Thus, it is an indispensable reference for cell and developmental biologists as well as those, especially in the fields of stem cell biology and regenerative medicine, who are interested in targeting the Wnt pathway for therapeutic purposes.

2012, 454 pp., illus (75 4C and 6 B&W), index
Hardcover $135

ISBN 978-1-936113-23-1

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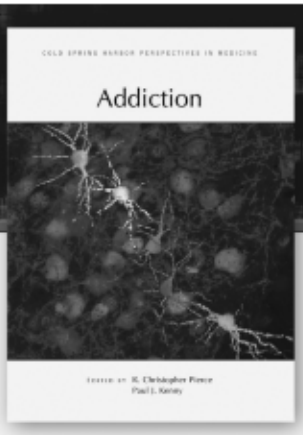
Addiction



Edited by R. Christopher Pierce, *University of Pennsylvania* and Paul J. Kenny, *The Scripps Research Institute*

Drug and alcohol abuse elicits significant biological changes in the brain that drive compulsive behavior and lead to addiction. Abrupt cessation leads to withdrawal, craving, and relapse. A complete understanding of the brain changes produced by abused substances is therefore necessary if we are to develop treatments for drug dependence.

Written and edited by experts in the field, this collection from *Cold Spring Harbor Perspectives in Medicine* explores the biological basis of addiction to alcohol, nicotine, and other psychoactive drugs. Contributors describe the molecular targets of these drugs, the resulting changes to neural networks, and the various genetic, developmental, and behavioral factors that influence the progression from abuse to addiction. Animal models of addictive behavior and techniques to dissect neural circuits are also described.

This volume includes discussion of compounds currently used or under development to treat drug dependence. Thus, it is an indispensable reference for neuroscientists and all who are interested in reducing the public health burden of substance abuse.

2012, 368 pp., illus (30 4C and 25 B&W), index
Hardcover $135

ISBN 978-1-936113-47-7

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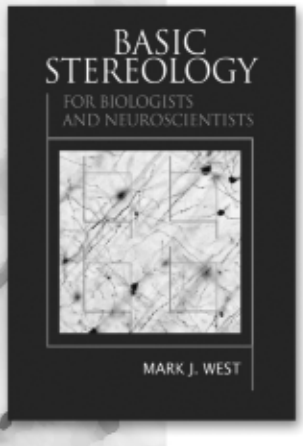
Basic Stereology
for Biologists and Neuroscientists



By Mark J. West, *University of Aarhus, Denmark*

Stereological techniques allow biologists to create quantitative, three-dimensional descriptions of biological structures from two-dimensional images of tissue viewed under the microscope. For example, they can accurately estimate the size of a particular organelle, the total length of a mass of capillaries, or the number of neurons or synapses in a particular region of the brain.

This book provides a practical guide to designing and critically evaluating stereological studies of the nervous system and other tissues. It explains the basic concepts behind design-based stereology and how to get started. Also included are detailed descriptions of how to prepare tissue appropriately, perform pilot studies and decide on the appropriate sampling strategy, and account for phenomena such as tissue shrinkage. Numerous examples of applications of stereological methods that are applicable to studies of the central system and a wide variety of other tissues are explained. The book is therefore essential reading for neurobiologists and cell biologists interested in generating accurate representations of cell and tissue architecture.

2012, 206 pp., illus., index
Hardcover $69

ISBN 978-1-936113-60-6

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