Regulatory Networks in Stem Cells (Stem Cell Biology and Regenerative Medicine)

From Brand: Humana Press
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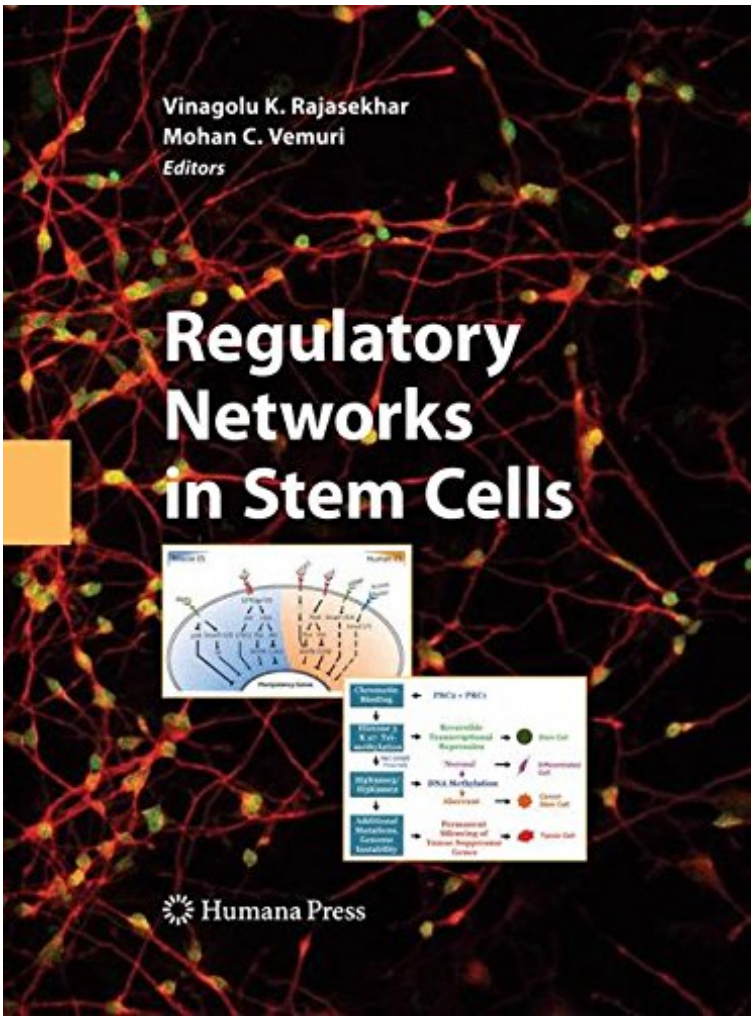

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From Brand: Humana Press : Regulatory Networks in Stem Cells (Stem Cell Biology and Regenerative Medicine) before purchasing it in order to gage whether or not it would be worth my time, and all praised Regulatory Networks in Stem Cells (Stem Cell Biology and Regenerative Medicine):

Stem cells appear to be fundamental cellular units associated with the origin of multicellular organisms and have evolved to function in safeguarding the cellular homeostasis in organ t- sues. The characteristics of stem cells that distinguish them from other cells have been the fascinating subjects of stem cell research. The important properties of

stem cells, such as ma- tenance of quiescence, self-renewal capacity, and differentiation potential, have propelled this exciting ?eld and presently form a common theme of research in developmental biology and medicine. The derivation of pluripotent embryonic stem cells, the prospective identi?cation of multipotent adult stem cells, and, more recently, the induced pluripotent stem cells (popularly called iPS) are important milestones in the arena of stem cell biology. Complex networks of transcription factors, different signaling molecules, and the interaction of genetic and epi- netic events constantly modulate stem cell behavior to evoke programming and reprogramming processes in normal tissue homeostasis during development. In any given cellular scenario, the regulatory networks can pose considerable complexity and yet exert an orderly control of stem cell differentiation during normal development. An aberration in these ?nely tuned processes during development usually results in a spectrum of diseases such as cancers and neurological disorders. Thisunderscorestheimminentneedforamorecompleteunderstandingofmolecular mechanisms underlying the regulatory circuitries required for stem cell maintenance. Overthepast35years,adiversegroupofbenchandphysicianscientistshaveprospectively enhanced our knowledge of stem cell biology. These studies are unveiling many unrecognized or previously unknown fundamentals of developmental biology.

From the reviews: This volume is an initial attempt to decipher the key factors involved in stem cell pluripotency, maintenance, and directed differentiation toward specific cell lineages and stem cell types. The presentation of the contents is such that upper-grade undergraduates, graduate students, postgraduates, and basic research as well as clinical research scientists are provided with accessible information about recent advances in the stem cell field. The volume consists of 43 comprehensively written chapters divided into five parts . (Anticancer Research, Vol. 29 (11), November, 2009)From the Back CoverThis book ambitiously incorporates all the latest and essential subjects on molecular regulation in embryonic, tissue, and cancer stem cells. The chapter on pathology and therapy is also fairly informative. I highly appreciate rigorous effort by all the editors and contributors, and strongly recommend this book to experts as well as students - Dr. Shinya Yamanaka, Kyoto University, Japan This new volume provides a broad overview of the regulation of stem cell renewal and differentiation from a diverse panel of expert authors. The chapters cover a remarkable range of topics, from molecular biology and model systems to translational and clinical implications of stem cell research. The book will be useful to both students and experienced researchers in the field. - Dr. Martin Pera, University of Southern California, Los Angeles, CA. USA. The application of stem cell 'thinking' and stem cell science to the biology of development, to tissue homeostasis, and to the generation of cancers has resulted in the explosion of new experiments and new models over the past several years. The rate of knowledge accumulation exceeds the abilities of most scientists, and especially aging scientists, to digest by reading the primary literature. Here Rajasekhar and Vemuri have brought together essays and reviews by world leaders in all areas of stem cell research--tissue and organ [adult] stem and progenitor cells, cancer stem cells, classical embryonic pluripotent stem cells, and pluripotent stem cells derived by nuclear reprogramming of adult somatic mature cell nuclei. It even covers the fast breaking field of induced pluripotent stem [iPS] cells, somatic cells that were reprogrammed by the transfection of as little as 3 genes whose gene products can re-set the genome of a mature cell to that of a pluripotent cell. The potentials of all of these areas to study and begin to understand human developmental biology, to produce from patients with genetic diseases pluripotent stem cells that can make all of the cell types affected in the disease, and the obvious translational attempts with tissue and organ stem cells promises to make these approaches, and the reviews in this book, the center of research in regenerative medicine. The identification of cancer stem cell in those cancers that have them [not cancers of stem cells, but the intratumoral cell subset that regenerates the entire tumor while self-renewing] will certainly help provide targets for drug therapies and novel imaging agents in the identified signal transduction pathways they use; and immunotherapy targets by the novel proteins and peptides [at least]that are created by mutations, translocations, and splicing anomalies central to the oncogenic progression in these cancer stem cells. The book is an essential addition to the libraries of scientists and institutions that do and teach stem cell research. I commend the editors and authors for an excellent and exciting book. - Irv Weissman MD, Stanford University