Heart Development and Regeneration

Heart Development and Regeneration (set of two books):
Author: Nadia Rosenthal and Richard P. Harvey
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Congenital Heart Disease (CHD) is one of the largest birth defects affecting up to 1% of live births. To deal with this, there has been a rapid increase in studies to understand the heart developmental process in last few years. With the advancement in the surgical technologies, there has been increase in the survival rate of the patients with the CHD, sometimes requiring lifelong postsurgical care. Also there is a need to regenerate tissue in severely defective child as well as adults with heart failure. To tackle such developments in cardiovascular medicine, one needs to have a more perfect understanding of the processes in cardiovascular development and repair. Dr. Rosenthal and Dr. Harvey extended their first book on heart development published in 1999 with a current research advances that include not only knowledge of development of cardiovascular system, but also growing field of regenerative heart medicine and research.

The two-volume book is a collection of most modern information on cardiac evolution and lineage to regenerative medicine. It has a total of 46 chapters categorized into 14 broad sections. Eight sections of volume one mostly cover the conventional chapters of evolution and lineage of primary and secondary heart field, role of transcription factors and patterning of the cardiovascular systems etc. Besides mouse, other models systems for cardiovascular disease were systematically included in this volume. Section one has four chapters that include evolution of heart and details of cardiac developments in *Drosophila*, zebrafish, frog and aves. Section two covers the fate map of progenitor cells from heart fields and development of conduction systems. Section three has chapters dealing with models of cardiac chamber formation and congenital malformations. Section four covers the left right asymmetry in heart and its role in disease. Section five gives a comprehensive description of epicardial cell origin and its role in signaling and disease process. Section six covers molecular regulation of cushion and valve formation and its role in CHD. Section seven has chapters dealing with role neural crest cells in development of cardiovascular system and disease. Chapter eight covers the origin of endothelial cell lineage and vascular development.

The volume two covers the incorporation of modern technologies in the field of heart development and regeneration. Six sections of the volume two have 21 chapters. Section one contains five chapters and covers the role of transcription factors and *homeodomain* as the regulators of heart development and cardiogenesis. Section two incorporates the role of epigenetic factors and micro Ribonucleic acids (miRNAs) in heart development. Section three contains chapters dealing with modern omics approach (genomic and proteomic) in field of heart development and disease. This section also contains a chapter describing about imaging techniques in cardiac developmental malformation. Section four contains chapters describing evolution of cardiac regeneration and use of zebrafish model system in regeneration research. Two chapters in section five describe potential avenues of regeneration and repair through tissue and embryonic stem cells. Section six deals with cardiac regeneration and covers chapters regarding requirement of vascularization, aging etc.

Together, two volumes of the book cover all aspect of cardiac development and regeneration and are very useful

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reference books not only for researchers and clinicians, but also for teachers and students. These books cover information about the most recent advances in the field and are articulated with high, up to date information from authorities all over the world and would serve as a benchmark reference for several years.

Bishwanath Chatterjee

Laboratory of Developmental Biology, National Heart Lung and blood Institute, National Institutes of Health, Bethesda, MD 20892, USA.
E-mail: chatterb@mail.nih.gov

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