
Preface

Regenerative medicine is the synthesis of a multi-disciplinary approach to repair, replace and regenerate cells in all their multifarious ramifications as successful biological functional units in a seamless conveyor where the *ex vivo* researcher (bio-engineer if you will) shall manipulate life signals to induce the cells to become what the body could not naturally replenish, whether due to pathophysiological obstructions, autoimmune malfunction or trauma. It is a perfect partnership of management of the malady and an almost silent transplantation of the “lost” tissue in an inside-out format.

Taking the central control of the fate of a cell or of the cells within a tissue, in a tissue engineering format, nurturing the cells as if they are in their innate milieu, nudging the cells to differentiate and behave in a desired manner by subtle directives in the 2D or 3D tissue culture plate, inducing co-habitation with other cells of our choice to gently transit them along the epigenetic landscape of our choice, to a tissue, an organ, fully functional to boot, is the complete job of an exponent and practitioner in the science and arts of regenerative medicine.

Regenerative medicine needs to be given a boost in terms of popularizing with a comprehensive down-to-earth approach as along with the other well-characterized branches of science in which Indian academia and industry are working hand in hand – this is a sector which I feel can be better developed. For this, an inter-disciplinary approach is necessary which is attempted in this book.

The concept of stem cells epitomizes the chameleon-like ever-changing landscape of biology, and reiterates the need to capture the essence of fundamental knowledge in biology with such clarity so that one is able to envisage the obvious manipulation by which it can be made beneficial to us.

This book talks about the concept of stem cells: the different types of stem cells in a spatio-temporal format, the sheer dynamicity of the structure-functional of the cells *vis-à-vis* the tissue, the organism, the age and physiological status of the organism and the organism within its natural environment versus transplanted neo-milieu.

This book is meant for undergraduate students of all branches of life sciences, who are getting to know this rather new and developing branch of biology, for post-graduate students of zoology, botany, microbiology, cell biology, biotechnology, physiology, immunology, developmental biology

and stem cell biology, who wish to know the subject in rather more intimate detail, for researchers who are venturing into this exciting new translational field while exploring fundamental nuances of development and epigenesis and finally the mature academician and industry person using this powerful tool to answer questions and devise ways to better tackle health sciences issues in degeneration. I wish the casual reader an enjoyable and happy read and the specialists a valuable ready reckoner that will help them unravel a path where none seems to exist!

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