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Stem Cell and Gene-Based Therapy

Frontiers in Regenerative Medicine

Springer

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With 62 Figures
including 27 Color Plates

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Foreword

Regenerative medicine promises to be one of the great future frontiers. Critical to the success of this area is stem cell research, and cell- and gene-based therapy. In this book, a variety of outstanding authors discuss important aspects of these research areas. Important topics include new types of cell therapies and stem cell-based therapy for angiogenesis and cardiac repair. They also include cell-therapy approaches in neurologic areas such as Parkinson's disease, multiple sclerosis, and stroke. A third area that is explored involves the development of cell-based systems for cartilage and bone repair, bladder repair, and kidney regeneration. A fourth area involves important work in the eye, specifically, optic nerve regeneration, retinal repair, and ocular surface regeneration. The potential of using insulin-producing cells or islets is also examined in this book, as are strategies for cord blood transplantation for various hematologic disorders. Finally, important areas of research involving skin regeneration and wound healing are discussed. This book should provide an excellent overview of the important areas in regenerative medicine with respect to cell and gene therapy and hopefully will be a useful guide for scientists doing research in these areas.

Robert Langer
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Preface

The human body has limited potential to rejuvenate injured organs and tissues. An old dream of scientists and physicians is to be able to rebuild "spare parts" to replace injured or diseased tissues—a notion that was once referred to as the field of science fiction. The new discipline of regenerative medicine aims to help the body heal itself with cells, genes, and bioactive molecules and materials. In the last decade, the notion that stem cells can give rise to mature tissues has made stem cells the focus of intense research designed to explore their promise for the treatment of a variety of diseases.

The aim of our book is to cover key aspects of the promise and existing problems in the emerging field of regenerative medicine. With the contribution of leading figures and pioneers in various disciplines of regenerative medicine and science, the book brings together major approaches of stem cell and gene-based therapy in one text.

The appearance of this book has been made by the willing and corporation of many individuals. We thank our contributors, and section editors Belkin, Dekel, Efrat, Grossman, Melamed, Nagler, Offen, Nevo, and Reisner for generously sharing their expertise and scientific skills on which this book is based. We hope that the book will provide a realistic image of the huge potential, promise and challenges facing the fantastic field of regenerative medicine in its quest to cure disease and prolong life.

Alexander Battler
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Section 1

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