

Preface

Stem cells are a class of undifferentiated master cells that have robust self-renewal kinetic and differentiation potential into many specialized cell types in the body.

Stem cell research has been a field of great clinical interest with immense possibilities of using the stem cells to replace, restore, or enhance the biological function of damaged tissues and organs due to accidents, diseases, and/or developmental defects.

Recent studies have demonstrated that mesenchymal stem cells (MSCs) are found in various tissues in an adult organism. MSCs derived from teeth and supporting tissues, called dental stem cells (DSCs), have been mainly characterized into five different cell types including dental pulp stem cells (DPSCs), dental follicle stem cells (DFSCs), periodontal ligament stem cells (PDLSCs), stem cells from human exfoliated deciduous teeth (SHEDs), and stem cells from the apical papilla (SCAPs).

The knowledge of stem cell technology is moving extremely fast in both dental and medical fields. Advances in DSC characterization, standardization, and validation of stem cell therapies and applications have been leading to the development of novel therapeutic strategies.

Several investigators, especially those who have made significant contribution to the field of DSC research, have been invited to create this book. With the help of their intense and substantive efforts, this book reviews different aspects, challenges, and gaps of basic and applied dental stem cell research, cell-based therapies in regenerative medicine concentrating on the application and clinical use, and recent developments in cell programming and tissue engineering. This review will be useful to students, teachers, clinicians, and scientists, who are interested or working in the fields of biology and medical sciences related to dental stem cell therapy and related practices.

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