

# Preface

Diabetes mellitus (DM), commonly referred to as diabetes, is a group of metabolic diseases in which high blood sugar levels are present over a prolonged period. According to the World Health Organization, the number of diabetic patients rapidly increased for 10 years and will continuously increase in the coming years. DM is divided into two main groups: type 1 DM and type 2 DM. Type 1 DM is considered as an autoimmune disease in which beta cells in the pancreas are destroyed, while type 2 DM is considered as the insulin resistance of body cells. In recent years, both type 1 and type 2 DMs are demonstrated as results of abnormal immune systems in patients. DM can cause many complications including diabetic ketoacidosis, nonketotic hyperosmolar coma, or death. Kidney failure and foot ulcers are two serious complications of DM. Generally, pancreas, kidney, or skin injuries are resulting from injuries of the immune system and tissue aging.

In the current years, stem cell therapies for pancreas, kidney, and skin regeneration are moved to the clinic with exciting results. A majority of clinical applications used hematopoietic stem cells and mesenchymal stem cells. Hematopoietic stem cells can replace the abnormal immune system with a new normal immune system, while mesenchymal stem cells are used with two strategies including immune modulation and cell replacement.

This volume of *Stem Cells in Clinical Applications* book series with the title *Pancreas, Kidney, and Skin Regeneration* aims to provide an updated invaluable resource for advanced undergraduate students, graduate students, researchers, and clinicians in stem cell applications for pancreas, kidney, and skin regeneration. The book with 13 chapters covers almost the present applications of stem cells in DM treatment and kidney and skin regeneration. Chapters one through six discuss pancreas regeneration – diabetes mellitus treatment. Chapters seven and eight discuss stem cell therapies for kidney regeneration. And chapters nine through thirteen discuss wound/ulcer healing by stem cell transplantation as well as skin regeneration using stem cells.

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