

**A GUIDE FOR PATIENTS**

# **LITERATURE**

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literature page



# ❖ Diabetes

## ➤ **Pluripotent stem cell-derived pancreatic $\beta$ -cells: Potential for regenerative medicine in diabetes.**

Diabetes mellitus, which affects 346 million people, is one of the leading causes of death worldwide. Pancreatic  $\beta$ -cells, existing in the islets of Langerhans, play central roles in the progression of diabetes. An efficient strategy to produce functional pancreatic  $\beta$ -cells is important for both transplantation therapy and disease modeling of diabetes. Human pluripotent stem cells, including human embryonic and induced pluripotent stem cells, provide unlimited starting materials to generate differentiated cells for regenerative studies. Significant progress has been made in human embryonic/induced pluripotent stem cell differentiation in the last several years.



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## ➤ **Stem cells as a potential therapy for diabetes mellitus: A call-to-action in Latin America**

Latin America is a fast-growing region that currently faces unique challenges in the treatment of all forms of diabetes mellitus. The burden of this disease will be even greater in the coming years due, in part, to the large proportion of young adults living in urban areas and engaging in unhealthy lifestyles. Unfortunately, the national health systems in Latin American countries are unprepared and urgently need to reorganize their healthcare services to achieve diabetic therapeutic goals.

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## ➤ **Mesenchymal Stem Cells as a New Therapeutic Approach for Diabetes and Pancreatic Disorders**

Diabetes is a worldwide disease that includes different disorders related to glucose metabolism. According to different epidemiological studies, patients affected by diabetes present a higher risk of developing both acute and chronic pancreatitis, clinical situations which, in turn, increase the risk of developing pancreatic cancer. Current therapies can adjust insulin levels according to blood glucose peak. Still, they only partly aim to abrogate the consequent inflammatory milieu responsible for diabetes-related diseases.

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## ➤ **Clinical efficacy on glycemic control and safety of mesenchymal stem cells in patients with diabetes mellitus: Systematic review and meta-analysis of RCT data**

Diabetes mellitus as a chronic metabolic disease is threatening human health seriously. Although numerous clinical trials have been registered for the treatment of diabetes with stem cells, no articles have been published to summarize the efficacy and safety of mesenchymal stem cells (MSCs) in randomized controlled trials (RCTs).

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## ➤ **Therapeutic Potential of Mesenchymal Stem Cells for Diabetes**

Mesenchymal stem cells (MSCs) are self-renewing multipotent cells that can secrete multiple biological factors that can restore and repair injured tissues. Preclinical and clinical evidence have substantiated the therapeutic benefit of MSCs in various medical conditions. Currently, MSCs are the most commonly used cell-based therapy in clinical trials because of their regenerative effects, ease of isolation, and low immunogenicity. Experimental and clinical studies have provided promising results using MSCs to treat diabetes. This review will summarize the role of MSCs on tissue repair, provide emerging strategies to improve MSC function, and describe how these processes translate to clinical treatments for diabetes.

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## ➤ **Therapeutic Potential of Wharton's Jelly Mesenchymal Stem Cells for Diabetes: Achievements and Challenges**

Diabetes mellitus (DM) is an alarming metabolic disease in which insulin-secreting  $\beta$ -cells are damaged to various extent. Unfortunately, although currently available treatments help to manage the disease, however, patients usually develop complications, as well as decreased life quality and increased mortality. Thus, efficient therapeutic interventions to treat diabetes are urgently warranted. During the past years, mesenchymal stem cells (MSCs) have made their mark as a potential weapon in various regenerative medicine applications. The main fascination about MSCs lies in their potential to exert reparative effects on an amazingly wide spectrum of tissue injury.

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## ➤ Stem Cell Therapy for Diabetes

Stem cell therapy holds immense promise for the treatment of patients with diabetes mellitus. Research on the ability of human embryonic stem cells to differentiate into islet cells has defined the developmental stages and transcription factors involved in this process.

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