بسم الله الرحمن الرحيم

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تم رفع هذه الرسالة بواسطة / حسام الدين محمد مغربي

بقسم التوثيق الإلكتروني بمركز الشبكات وتكنولوجيا المعلومات دون أدنى مسئولية عن محتوى هذه الرسالة.

ملاحظات : لا يوجد

Ain Shams University
Faculty of Science
Department of Biochemistry

Evaluation of the Therapeutic Impact of Mesenchymal Stem Cells in a Rat Model of Experimentally Induced Type 2 Diabetes

A Thesis for partial fulfillment of the requirements for Master Degree of Science in Biochemistry

Submitted By

Doaa Mahmoud Youssef

(B. Sc. in Biochemistry - Chemistry, 2010)

Under Supervision of

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بسم الله الرحمن الرحيم

"قالوا سبحانك لا علم لنا إلا ما علمتنا إنك أنت العليم الحكيم"

صدق الله العظيم

(سورة البقرة آية: ٣٢)

Dedication

To my mother, my father, my brothers, my sister and my friends for their love, encouragement, help and prayers that made studies possible and to them I owe everything.

Doaa Mahmoud Youssef Youssef

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Approval sheet

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Abstract

Insulin resistance and defect in insulin-producing pancreatic beta cells are the key features of type 2 diabetes (T2D). Mesenchymal stem cells isolated from bone marrow (BM-MSCs) have differentiation, anti-inflammatory and immunosuppressive characteristics, making them suitable for treating T2D. Therefore, the present study aimed at investigating the possible therapeutic mechanisms of BM-MSCs infusion in high fat diet/streptozotocin (HFD/STZ)-induced T2D rats. Thirty male Wistar rats were divided into 3 groups: Normal control, T2D, and T2D treated with BM-MSCs. The anti-diabetic effect of BM-MSCs was evidenced by ameliorating the state of hyperglycemia, hyperinsulinemia, and hyperlipidemia. BM-MSCs enhanced significantly insulin sensitivity in diabetic rats *via* decreasing leptin levels in serum and consequently, increasing adiponectin/leptin ratio, compared to T2D group. Furthermore, BM-MSCs improved glucose homeostasis by up-regulating gene expressions of hepatic glucokinase and glycogen synthase in the liver and skeletal muscles as well as increasing their levels. Treatment of T2D with BM-MSCs stimulated pancreatic regeneration in diabetic rats by up-