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## THE EFFECT OF MATERNAL DIABETES AND INSULIN TREATMENT ON NEUROGENESIS IN THE DEVELOPING HIPPOCAMPUS OF MALE RATS

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Diabetes in pregnancy is associated with an increasing risk of congenital malformations and central nervous system disorders (CNS) especially hippocampal neuronal circuitry disruption as a discrete region involved in neurogenesis phenomenon. All animals were randomly divided into three groups as follows: Control group, Diabetic (STZ-D), Diabetic treated with insulin (STZ-INS). Diabetes was induced in Wistar female rats by Streptozotocin intraperitoneal injection (single dose). Following confirmation of diabetes, animals were mated with non-diabetic males. At the post-natal day 14 (P14), the brain of male offspring's were removed for further study. In fact Immunofluorescence staining and Real time - PCR assays are used for evaluation of neurogenesis phenomenon. Our results showed a significant higher level of hippocampal DCX expression and an increase in the mean number of DCX positive cells in the DG of diabetic group male offspring ( $P < 0.05$ ). We also found an insignificant up-regulation in the expression of DCX and the mean number of positive cells in the insulin-treated diabetic group neonates as compared to control group ( $P > 0.05$ ). Nevertheless the results of immunofluorescence staining for NeuN also indicated that the mean number of NeuN+ cells was significantly lower in dentate gyrus of diabetic group male offspring ( $P < 0.05$ ). Besides, there were significant down-regulation in the hippocampal mRNA expression of NeuN in diabetic pups compare to control ( $P < 0.05$  each). Our results revealed that diabetes during pregnancy has an adverse effect on the hippocampal neurogenesis in rat neonates. Furthermore, the control of glycemia by insulin is sufficient to prevent the alterations in expression of neurogenesis markers.