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Diabetes mellitus and signal transduction

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Abstract

Diabetes mellitus is a metabolic disorder that affects glucose, lipid, and protein metabolism. In diabetes mellitus, a decrease in antioxidants and an increase in reactive oxygen species stimulate the production of tumor necrosis factor TNF- and ADAM17. During the treatment of streptozotocin-induced diabetic rats with Nigella sativa oil (NSO) in combination with various antidiabetic medications, insulin-induced signaling molecules in liver and brain tissues was investigated. An examination of lipid profile, antioxidant activity, and signaling molecules in the absence and presence of anti-diabetic medicines validated NSO's anti-diabetic impact. It was hypothesized that during the treatment of diabetes, there is an interaction between herbs and drugs. Moreover, the mechanism of action of combined nano-selenium and metformin as a promising therapeutic alternative that alleviates major diabetes symptoms and insulin resistance synergistically was described. The risk of type 2 diabetes complications was minimized. This occurred possibly via a free radical scavenging effect, improving insulin sensitivity and activating pIRS1/pAKT/pGSK-3 signaling pathway as well as pAMPK Accordingly, the treatment of diabetes may occur through the interference of cell signaling.

Biography

Mahmoud Balbaa has received his PhD in Hokkaido University, Japan during the period of 1984-1988. Currently, he is working as a professor of biochemistry in Alexandria University, Egypt. He was appointed as head of the Biochemistry Department, Alexandria University, Egypt from 2007 to 2009. His research has included the study of enzyme characterization and inhibition, cell signaling and the biochemical parameters in diseases. Based on this research and fellowship training, he has received several awards and honors, such as post-doctoral fellowship from the Medical Research Council, Canada, post-doctoral fellowship from AIEJ, Japan. He is serving as an editorial member of several reputed journals. He has authorized more than 70 research articles.
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