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Cellular mechanism of yeast derived insulin mimetic material

Nitsa Mirsky University of Haifa, Israel

The Glucose Tolerance Factor (GTF) is a dietary agent extracted from brewer's yeast. GTF reversed glucose intolerance in diabetic animals and humans. We found that oral treatment with GTF decreased blood glucose and lipids and potentiated insulin action in type 1 & 2 diabetic animals. GTF also decreased lipid peroxidation in blood and organs of the treated animals. We also found that addition of GTF to diabetic rats immediately with the induction of diabetes, inhibited the development of nephropathy and retinopathy in these animals. *In vitro* studies showed that GTF increased glucose transport into adipocytes and myocytes, in insulin-like mode. When a combination of GTF and insulin was supplemented to the cells, a synergy between GTF and insulin was detected

Treatment of 3T3-L1 and L-6 cells with GTF increased the phosphorylation of key proteins along insulin signaling pathway, in a time and dose-dependent manner. Whereas GTF increased tyrosine phosphorylation of insulin receptor substrate (IRS)-1 and stimulated the activation of Akt and p44/42 MAPK, it did not affect tyrosine phosphorylation of insulin receptor (IR). We treated CHO cells over expressing insulin receptor (CHO-IR) with either insulin or GTF. Whereas a remarkable elevation in phosphorylation of IR was detected when these cells were treated with insulin, any phosphorylation above control values was not detected when CHO-IR cells were treated with GTF. Our data demonstrates that GTF acts through insulin-signaling pathway, but probably not via insulin receptor. Our findings present GTF as a novel oral "insulin-like" material for future treatment of diabetes.

Biography

Nitsa Mirsky completed her PhD studies at the Technion, Israel, and her Postdoctoral studies at Stanford university. Through her long academic career she investigated anti diabetic natural compounds activity both *in vivo* and *in vitro*. She was the founder and president of Natural Compounds Ltd, a company that developed anti diabetic agents from natural sources. Dr. Mirsky has been a member of the Faculty of Natural Sciences at the university of Haifa, where she served also as the head of the department of biology. She supervised dozens of M.Sc and Ph.D students and published many articles in the field of diabetes.

nmirsky@bezeqint.net

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