CoMBoS

1st Congress of Molecular Biologists of Serbia

KNJIGA SAŽETAKA
BOOK OF ABSTRACTS

Beograd 2017 / Belgrade 2017

Reviewers:
Gordana Matić
Melita Vidaković
Ana Đorđević
Dušanka Savić-Pavićević
Goran Brajušković
Jelena Lozo
Branko Jovčić

Publisher:
University of Belgrade, Faculty of Biology
Belgrade, Serbia

Editors:
Goran Brajušković
Ana Đorđević

Cover and logo design:
Dušan Radojević
Ivan Strahinić
Goran Brajušković

Printed by:
Electronic edition

Printed by:
University of Belgrade, Faculty of Belgrade

This publication is printed on 250 copies

2017

First Congress of Molecular Biologists of Serbia

with international participation

Belgrade, Serbia

September 20 – 22, 2017.

CoMBoS

1st Congress of Molecular Biologists of Serbia

GLUCOCORTICOID-MEDIATED EFFECTS OF MIF DEFICIENCY AND FRUCTOSE-ENRICHED DIET ON LIPID METABOLISM IN THE MOUSE INTRA-ABDOMINAL ADIPOSE TISSUE

Ljupka Gligorovska, Ana Đorđević, Biljana Bursać, Ana Teofilović, Nataša Veličković, Danijela Vojnović Milutinović, Sanja Kovačević, Gordana Matić

Institute for Biological Research "Siniša Stanković", University of Belgrade, Belgrade, Serbia.

Introduction: The macrophage migration inhibitory factor (MIF) is a pro-inflammatory cytokine involved in metabolic inflammation and regulation of glucocorticoid action. Low-grade inflammation in adipose tissue is associated with obesity and dyslipidemia and may be caused by fructose-enriched diet. We hypothesized that the effects of MIF deficiency on lipid metabolism in adipose tissue, after high fructose consumption, could be mediated by glucocorticoids (GCs) as potent regulators of energy metabolism.
Methods: We analyzed the effects of 9-week 20% fructose-enriched diet on energy intake, body mass, intra-abdominal adipose tissue mass and histology in MIF wild type (WT) and MIF deficient ($MIF^{-/-}$) C57Bl/6J mice. Expression of key transcriptional regulators involved in adipogenesis and lipogenesis, peroxisome-proliferator-activated receptor γ (PPARγ) and sterol regulatory element-binding protein-1 (SREBP-1), was also assessed. Glucocorticoid signaling was characterized by prereceptor metabolism, glucocorticoid receptor (GR) protein level and phosphorylation, and expression of GC-target genes involved in lipogenesis.
Results: Both WT and $MIF^{-/-}$ mice on fructose diet had increased energy intake, but the elevation of adipose tissue mass and enlargement of adipocytes were observed only in fructose-fed $MIF^{-/-}$ mice. Elevated GR protein level and its activating Ser^{220} phosphorylation, enhanced glucocorticoid prereceptor metabolism, an increase in PPARγ and SREBP-1 levels and induced expression of all examined lipogenic genes were also observed in $MIF^{-/-}$ mice on fructose diet.
Conclusion: The results show that only under fructose caloric overload MIF deficiency results in lipogenesis and adipocyte hyperthrophy and that this effect might be mediated by enhanced glucocorticoid signalling in intra-abdominal adipose tissue.

Acknowledgements: This study was supported by the grant No. III41009 from the Ministry of Education, Science and Technological Development, Republic of Serbia.