

**“STUDING THE EFFECTS OF A COMBINED
ADIPONECTIN-METFORMIN ON GLUCOSE AND
LIPIDS LEVELS WITH ANTI-ULCEROGENIC ACTIVITY
OF ADIPONECTIN AGAINST ETHANOL INDUCED
GASTRIC MUCOSAL INJURY IN RAT BLOOD”**

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**FACULTY OF SCIENCE
UNIVERSITI OF MALAYA
KUALA LUMPUR**

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**DISSERTATION SUBMITTED IN FULFILLMENT OF
THE REQUIREMENT FOR THE DEGREE OF MASTER
OF BIOTECHNOLOGY**

**INSTITUTE OF BIOLOGICAL SCIENCE
FACULTY OF SCIENCE
UNIVERSITI OF MALAYA
KUALA LUMPUR**

2011

Abstract:

Adiponectin is a protein hormone secreted entirely by abdominal fat tissue. It has anti-diabetic, antiatherogenic and anti-inflammatory effects. The present study was performed to evaluate the effects of a combination of adiponectin with metformin on blood glucose, TG (triglyceride), CHOL (Total cholesterol), LDL (Low density lipoprotein) and HDL (High density lipoprotein) in mice and also to evaluate the anti-ulcerogenic activity of adiponectin against ethanol induced gastric mucosal injury in rats. Three groups of female ICR healthy mice were gavaged with 1% volume / body weight high fat-sucrose. Metformin in a dosage of 250mg/kg was added to the feed and a dosage of 2.5mg/kg adiponectin was injected intraperitoneally. Blood glucose was measured at one hour intervals for 5 hours. Blood concentrations of TG, CHOL, LDL and HDL were also measured at the end of the fifth hour of the experiment. On the other hand, four groups of adult albino Wistar rats were intraperitoneally injected with distilled water, omeprazole 20mg/kg body weight, 1.25mg/kg and 2.5mg/kg adiponectin one hour before oral administration of absolute ethanol to generate gastric mucosal injury. An hour after the oral intakes of absolute ethanol the rats were sacrificed and the ulcer areas of the gastric walls were determined. The results indicate that the effect of a combination of metformin and adiponectin on blood glucose and HDL is considerably effective, but made no significant difference on TG, LDL and CHOL levels. Moreover, histological studies of the gastric wall of negative control rats revealed severe damage of gastric mucosa, along with edema and leucocyte infiltration of the submucosal layer compared to rats pre-treated with either omeprazole or adiponectin extract where there was marked gastric protection along with reduction or inhibition of edema and leucocyte infiltration of the submucosal layer. In conclusion, the present findings

suggest that a combination therapy with metformin plus adiponectin is probably attributable to the natural cause of type 2 diabetes rather than to the effect of therapy itself, and also, adiponectin promotes ulcer protection as ascertained by the comparative decrease of inflammation ulcer areas, reduction of edema and leucocyte infiltration of the submucosal layer.

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Registration/Matric No: SGF070048

Name of Degree: Master of Biotechnology

Title of Project Paper/Research Report/Dissertation/Thesis (“this Work”): Studing the effects of a combined adiponectin-metformin on glucose and lipids levels with anti-ulcerogenic activity of adiponectin against ethanol induced gastric mucosal injury in rat blood

Field of Study:

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Acknowledgements

I would like to thank my parents and my dear friend Dr. Farzad Fakhreddin for their support, Assoc Prof, Zulqarnain Mohamed for his valuable guidance and advice, Prof. Mahmood Ameen for being very patient and supportive and Dr. Hossein Rothan for all the effort he put to teach me all valuable knowledge.

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List of Abbreviations:

ICR, Imprinting Control Region

TG, triglyceride

CHOL, Total cholesterol

LDL, Low density lipoprotein

HDL, High density lipoprotein

T2D, Type two diabetes

HF, High Fat

HMW, High Molecular Weight

MMW, Medium Molecular Weight

PAI-, plasminogen activator inhibitor type 1

AMP1 (also known as *GBP28*), encoded by *ACDC*

BMI, Body Mass Index

CD, Crohn's disease

PPAR γ , Peroxisome proliferator-activated receptor- γ

PCOS, polycystic ovary syndrome

SNPs, single nucleotide polymorphisms

TNF- α , Tumor necrosis factor-alpha

IL-6, Interleukin 6

CRP, C-Reactive Protein

TGF- α , Transforming growth factor alpha

BMGY, Buffered Glycerol-complex Medium

BMMY, Buffered Methanol-complex Medium

SDS-PAGE, Sodium dodecyl sulfate polyacrylamide gel electrophoresis

GLUT, Glucose transporters

AST, Aspartate aminotransferase

ALT, Alanine aminotransferase

GGT, Gamma glutamyl transferase

ICR, Imprinting Control Region

UMMC, University Malaya Medical Center

SMESE, Small Explorer for the Study of Solar Eruptions