



Relation between Serum Resistin and Insulin Resistance in Egyptian Type 2 Diabetic Patients

Thesis

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Declaration

I declare that this thesis is my own work and that, it contains no material previously published or produced by another party in fulfillment, partial or otherwise, of any other degree or diploma at another university or institute of higher learning.

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Dedication

To my mother, my father, my brother and my friends for their love, encouragement, help and prayers that made studies possible and to them i owe everything.

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قالوا

لَسْبَدَانِكَ لَا عِلْمَ لَنَا
إِلَّا مَا عَلَّمْتَنَا إِنَّكَ أَنْتَ
الْعَلِيمُ الْعَظِيمُ

صدق الله العظيم

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List of abbreviations

<i>Abbr.</i>	<i>Title</i>
3T3-L1	: A cell line derived from (mouse) 3T3 cells
ADA	: American diabetes association
AdipoR	: Adiponectin receptor
AgRP	: Agouti-related protein
Akt	: Serine/threonine-specific protein kinase
AMPK	: Adenosine monophosphate activated protein kinase
AP-1	: Activator protein-1
AT	: Adipose tissue
ATMs	: Adipose tissue macrophages
ATP	: Adenosine triphosphate
BMI	: Body mass index
BUN	: Blood urea nitrogen
C/EBPβ	: CCAAT-enhancer-binding protein beta
CAP-1	: Adenylyl cyclase-associated protein-1
CART	: Cocaine- amphetamine- regulated transcript peptide
CCL	: Chemokine (C-C motif) ligand
CCL3L1	: Chemokine (C-C motif) ligand 3-like 1
CD	: Cluster of differentiation
CE	: Cholesteryl ester
CHO	: Carbohydrates
CRP	: C-reactive protein
CVD	: Cardiovascular disease
CXCL	: Chemokine (C-X-C motif) ligand

DAG	: Diacylglycerol
db mice	: Diabetic mice
DCCT	: Diabetes control and complications trial
DGAT	: Diacylglycerol O-acyltransferase
DM	: Diabetes mellitus
EDTA	: Ethylene-diamine-tetra-acetic acid
ELISAs	: Enzyme-linked immunosorbent assays
EMBL-EBI	: European molecular biology laboratory/ european bioinformatics Institute
ET-1	: Endothelin 1
FAs	: Fatty acids
FATP-1	: Fatty acid transport protein-1
FFAs	: Free fatty acids
FOG-2	: Transcriptional regulator friend of Gata 2
FPG	: Fasting plasma glucose
FSH	: Follicle-stimulating hormone
G6Pase	: Glucose 6-phosphatase
GATA 2	: Human gene encoding GATA binding protein 2 - a transcription factor.
GDM	: Gestational diabetes mellitus.
GHb	: Glycated hemoglobin
GHbA	: Glycohemoglobin
GLUT4	: Glucose transporter type 4
GSK-3β	: Glycogen synthase kinase 3 <i>beta</i>
HbA₀	: Non-glycated hemoglobin
HbA₁	: Hemoglobin subunit alpha 1
HbA_{1c}	: Glycated hemoglobin
hCG	: Human chorionic gonadotropin

HDL-C	: High density lipoprotein cholesterol
HEK	: Human epithelial kidney
HIS	: Hepatic insulin sensitivity
HLA	: Human leukocyte antigen
HMM	: High molecular mass
HOMA-IR	: Homeostatic model assessment for IR
HOMA-β	: Homeostatic model assessment of β -cell function
HRP	: Horseradish peroxidase
IDDM	: Insulin-dependent diabetes mellitus
IκB	: Inhibitor of nuclear factor kappa B
IKK	: Inhibitor of nuclear factor kappa kinase
IL	: Interleukin
IMCL	: Intramyocellular lipid
IR	: Insulin resistance
IRS	: Insulin receptor substrate
JAK-STAT	: Janus kinase-signal transducer and activator of transcription
JNK	: c-Jun N-terminal kinase
L.C.	: Lean control group
L.D.	: Lean diabetic group
LADA	: Latent autoimmune diabetes of adults
LBM	: Lean body mass
LDL-C	: Low density lipoprotein cholesterol
LH	: Luteinizing hormone
LMM	: Low molecular mass
LPL	: Lipoproteinlipase
LPS	: Lipopolysaccharides

mAbs	: Monoclonal antibodies
MAPKs	: Mitogen-activated protein kinases
MBG	: Mean blood glucose
MHO	: Metabolically healthy obese
miR-200s	: MicroRNA-200s
mRNA	: Messenger RNA
MS	: Metabolic syndrome
NAFLD	: Non alcoholic fatty liver disease
NF-κB	: Nuclear factor kappa-light-chain-enhancer of B cells
NIDDM	: Non insulin-dependent diabetes mellitus
NO	: Nitric oxide
nPKC	: Novel protein kinase C
NPY	: Neuropeptide-Y
O.C.	: Obese control group
O.D.	: Obese diabetic group
OA	: Osteoarthritis
OD	: Absorbance
OGTT	: Oral glucose tolerance test
PAI-1	: Plasminogen activator inhibitor-1
PBMCs	: Peripheral blood mononuclear cells
PCOS	: Polycystic ovary syndrome
PEPCK	: Phosphoenolpyruvate carboxykinase
PI3K	: Phosphatidylinositol 3-kinase
PKC	: Protein kinase C
PKCθ	: Isoform protein kinase C
PPAR	: Peroxisome-proliferator-activated receptor
PPREs	: Peroxisome proliferator response elements

RBCs	: Red blood cells
RBP-4	: Retinol binding protein-4
RELM- α /FIZZ 1	: Resistin-like molecule - α /found in inflammatory zone 1
RELMS	: Resistin-like molecules
Resistin $\Delta 2$	: Humans resistin
Retn	: Resistin gene
RPM	: Round per minute
RSG	: Rosiglitazone
SNPs	: Single nucleotide polymorphisms
SOCS	: Suppressor of cytokine signaling
S-Resistin	: Short resistin
STAT3	: Signal transducer and activator of transcription 3
sTWEAK	: Soluble tumour necrosis factor-like weak inducer of apoptosis
SVF	: Stroma-vascular fraction
T1DM	: Type 1 diabetes mellitus
T2DM	: Type 2 diabetes mellitus
TAG	: Triacylglycerol
TCA	: Trichloroacetic acid
Tg	: Transgenic
TGs	: Triacylglycerols
THb	: Total hemoglobin
TLR	: Toll-like receptor
TMB	: Tetramethylbenzidine
TNF-α	: Tumor necrosis factor - α
t-PA	: Tissue plasminogen activator
TRAF-3	: TNF-receptor-associated factor-3

TZDs	: Thiazolidinediones
UCP3	: Uncoupling protein-3
u-PA	: Urokinase plasminogen activator
UPR	: Unfolded protein response
UTR	: Untranslated region
VLDL	: Very low density lipoprotein
WAT	: White adipose tissue
WHO	: World health organization