شبكة المعلومات الجامعية

بسم اللّه الرحمن الرحيم

شبكة المعلومات الجامعية
@ ASUNET

شبكة المعلومات الجامعية
التوثيق الالكتروني والميكروفيلم

شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

نقسم باللّه العظيم أن المادة التي تم توثيقها وتسجيلها علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات

يجب أن

تحفظ هذه الأقراص المدمجة بعيدا عن الغبار

MicroRNA-146a Expression as a Potential Biomarker for Rheumatoid Arthritis in Egypt

Thesis

Submitted to Faculty of Medicine, Ain Shams University for Partial Fulfillment of M.D Degree in Medical Microbiology and Immunology

By

Heba Mohamed Abdelkader Elsayed

MBB Ch, M Sc

Faculty of Medicine, Ain shams university

Under Supervision of

Dr. Maha Salah El-din Hamdy

Professor of Medical Microbiology and Immunology

Faculty of Medicine, Ain Shams University

Dr. Ayman Asaad Ibrahim

Professor of Medical Microbiology and Immunology

Faculty of Medicine, Ain Shams University

Dr. Walaa Shawky Khater

Assistant Professor of Medical Microbiology and Immunology

Faculty of Medicine, Ain Shams University

Dr. Nashwa Ali Morshedy

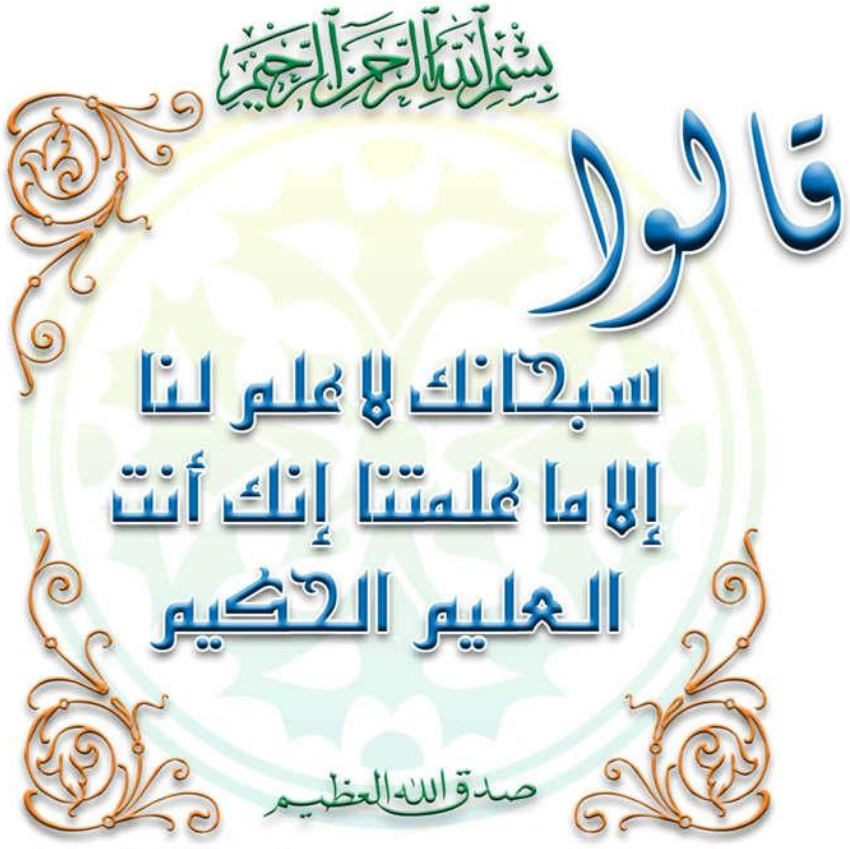
Assistant Professor of Rheumatology and Internal Medicine

Faculty of Medicine, Ain Shams University

Faculty of Medicine

Ain Shams University

2021



سورة البقرة الآية: ٣٢

First of all, thanks to Allah whose magnificent help was the main factor in completing this work.

Words cannot express my deepest gratitude to **DR. FATEN MOSTAFA ALI,** *Professor and head of Medical Microbiology and Immunology, Faculty of Medicine, Ain Shams University, for her encouragement and support to complete such work.*

Words cannot express my deepest gratitude to **DR. MAHA SALAH EL-DIN HAMDY,** *Professor of Medical Microbiology and Immunology, Faculty of Medicine, Ain Shams University, who helped me throughout this work by training, precious instructions, valuable advice, and scientific knowledge to accomplish such work.*

It has been a great honor for me to work under hisr generous supervision. Great words really needed to express my gratitude, sincere appreciation and respect to **DR. AYMAN ASAAD IBRAHIM,** *Professor of Medical Microbiology and Immunology, Faculty of Medicine, Ain Shams University, for his great help, continuous support, and sincere advice during this work.*

I would also like to thank **DR. WALAA SHAWKY KHATER,** *Assistant Professor of Medical Microbiology and Immunology, Faculty of Medicine, Ain Shams University for her continuous encouragement, guidance, and support.*

I would also like to thank **DR. NASHWA ALI MORSHEDY,** *Assistant Professor of Rheumatology and Internal Medicine,*

Faculty of Medicine, Ain Shams University for her continuous guidance and support she gave me throughout the whole work.

Finally, my deepest thanks to all my family and colleagues who helped me in the production of this work.

HEBA MOHAMED ABDELKADER.

Contents

List of Abbreviations

Abbreviation	: Full-term
ACPAs / anti-CCP	**:** Anti-Citrullinated Protein/Peptide Antibodies.
ACR	**:** American College of Rheumatology.
AGO2	**:** Argonaute 2.
ARA	**:** American Rheumatism Association.
ASUH	**:** Ain Shams University Hospitals.
AUC	**:** Area Under the Curve.
BCR	**:** B-Cell Receptor.
CBC	**:** Complete Blood Count.
CDAI	**:** Clinical Disease Activity Index.
cDNA	**:** Complementary DNA.
CI	**:** Confidence Interval.
COX-1	**:** Cyclooxygenase-1.
COX- 2	**:** Cyclooxygenase-2.
CRP	**:** C-Reactive Protein.
DAS	**:** Disease Activity Scale.
DAS 28	**:** Modified Disease Activity Scale 28.
DGCR8	**:** Di George syndrome Critical Region 8.
DMARDS	**:** Disease-Modifying Anti-Rheumatic Drugs.
DNA	**:** Deoxyribo-Nucleic Acid.
DUSP	**:** Dual Specificity Protein Phosphatase.
EGA	**:** Evaluator Global Assessment.
ESR	**:** Erythrocyte Sedementation Rate.
EULAR	**:** European League Against Rheumatism.
FLS	**:** Fibroblast-Like Synoviocytes.
FO	**:** Follicular.
GCs	**:** Glucocorticoids.

GTP : Guanosine Triphosphate.

Hb : Haemoglobin.

HLA : Human Leukocyte Antigen.

HS : Highly Significant.

IFN-γ : Interferon- gamma.

IL : Interleukin.

IRAK : Interleukin-1 Receptor-Associated Kinase.

IRF-5 : Interferon Regulatory Factor-5.

lin-14 : Lineage gene defective-14.

LPS : Lipopolysaccharide.

LSD : Least Significant Difference.

MAPK : Mitogen activated protein kinase.

miR or miRNA : MicroRNA.

miRNPs : MiRNA-containing Ribonucleo-Protein Particles.

mRNA : Messenger RNA.

MZ : Marginal Zone.

NF-κB :Nuclear Factor kappa-light-chain-enhancer of activated B cells.

NGS : Next Generation Sequencing.

NO : Nitric oxide.

NPV : Negative predictive Value.

NS : Non-Significant.

NSAIDs : Non-Steroidal Anti-Inflammatory Drugs.

nt : Nucleotide.

PBMC : Peripheral Blood Mononuclear Cell.

PCR : Polymerase Chain Reaction.

PGA : Patient Global Assessment.

PI3K : Phosphatidyl-Inositol-3 kinase.

Piwi : P-element-induced wimpy testes.

Pol II : Polymerase II.

Pol III : Polymerase III.
Poly (A) tail : Poly-Adenylation tail.
PPV : Positive Predictive Value.
Pre-miRNA : Precursor miRNA.
Pri-miRNAs : Primary miRNA.
PTEN : Phosphatase and Tensin Homolog.
PTPN22 : Protein Tyrosine Phosphatase, Non-receptor type 22.
PV : Probability value.
qRT-PCR : Quantitative Real-Ttime PCR.
RA : Rheumatoid Arthritis.
RAFLS : Rheumatoid Arthritis fibroblast-like synoviocytes.
RAN : RAS-related Nuclear protein.
RF : Rheumatoid Factor.
RIG-1 : Retinoic acid-Inducible Gene 1.
RISC : RNA-Induced Silencing Complex.
RNA : Ribonucleic acid.
RNAi : RNA interference.
ROC : Receiver Operator Characteristic.
ROS : Reactive Oxygen Species.
rRNA : Ribosomal RNA.
rpm : Rounds per minute.
RQ : Relative Quantification.
S : Significant.
SD : Standard Deviation.
SDAI : Simplified Disease Activity Index.
SE : Standard Error.
SHP-2 : SH2 domain containing tyrosine phosphatase.
shRNA : Short hairpin RNA.
siRNA : Small interfering RNA.

SMARDs : Symptom-Modifying Anti-Rheumatic Drugs.
snoRNA : Small nucleolar RNA.
snRNA : Small nuclear RNA.
SOCS1 : Suppressor of Cytokine Signaling 1.
SPSS : Statistical Program for Social Science.
SS : Single Stranded.
STAT-1 : Signal Transducer and Activator of Transcription 1.
stRNA : Small temporal RNA.
TCR : T-Cell Receptor.
Th1 : T helper 1.
Th2 : T helper 2.
Th17 : T helper 17.
TLR : Toll-Like Receptor.
TNF-α : Tumor Necrosis Factor-alpha.
TRAF 6 : TNF Receptor-Associated Factor 6.
TRBP : Transactivating Response RNA Binding Protein.
tRNA : Transfer RNA.
VAS : Visual Analoge Scale.
XPO5 : Exportin 5.
WBCs : White Blood Cells.

List of Figures

List of Tables