



شبكة المعلومات الجامعية  
التوثيق الإلكتروني والميكروفيلم

# بسم الله الرحمن الرحيم



**HANAA ALY**



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# شبكة المعلومات الجامعية التوثيق الإلكتروني والميكروفيلم



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# جامعة عين شمس التوثيق الإلكتروني والميكروفيلم

## قسم

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



## يجب أن

تحفظ هذه الأقراص المدمجة بعيدا عن الغبار



**HANAA ALY**



# **The Association between Silent Mating Type Information Regulator 2 Homolog 1 (SIRT1) Gene Polymorphism and Systemic Lupus Erythematosus (SLE)**

Thesis

*Submitted for Partial Fulfillment of  
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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

# قَالَ

لَسْبِحَانَكَ لَا يَلْمُ لَنَا  
إِلَّا مَا عَلِمْنَا إِنَّكَ أَنْتَ  
الْعَلِيمُ الْعَظِيمُ

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# List of Abbreviations

Abb.	Full term
ACR	American College of Rheumatology
ANAs	Antinuclear antibodies
Anti-ds DNA	Anti-double stranded DNA
AP-1	Activator protein-1
APL	Antiphospholipid antibodies
AROS	Active regulator of SIRT1
BAFF	B cell activating factor
BcL-2	B-cell lymphoma 2
BCR	B cell receptor
B-regs	B Regulatory cells
C	Complement
CAD	Coronary artery disease
CD	Cluster of differentiation
CDL	Cluster of differentiation ligand
CH50	Total hemolytic complement
CLIF	Crithidia luciliae immunofluorescence
COPD	Chronic obstructive pulmonary disease
CRP	C reactive protein
DCs	Dendritic cells
DHPLC	Denaturing High-Performance Liquid Chromatography
DIL	Drug induced lupus
dsDNA	Double stranded deoxyribonucleic acid
ELISA	Enzyme linked immunosorbent assay
ENA	Extractable nuclear antigen
ER	Estrogen receptor
ESR	Erythrocyte sedimentation rate
FAM	Fluorescein amidite
FRET	Fluorescent resonance energy transfer

# List of Abbreviations cont...

Abb.	Full term
<i>HDACS</i> .....	<i>Histone deacetylases</i>
<i>HLA</i> .....	<i>Human leucocyte antigen</i>
<i>IFNs</i> .....	<i>Interferons</i>
<i>IIF</i> .....	<i>Indirect immunofluorescence test</i>
<i>IL</i> .....	<i>Interleukin</i>
<i>IQR</i> .....	<i>Interquartile range</i>
<i>LN</i> .....	<i>Lupus nephritis</i>
<i>MBL</i> .....	<i>Mannose Binding lectin</i>
<i>MGB</i> .....	<i>Minor groove binder</i>
<i>MRI</i> .....	<i>Magnetic resonance image</i>
<i>NAD</i> .....	<i>Nicotinamide adenine dineucleotide</i>
<i>NAMPT</i> .....	<i>Nicotinamide phosphoribosyltransferase</i>
<i>NF-kB</i> .....	<i>Nuclear factor kB</i>
<i>NHD</i> .....	<i>Normal healthy donor</i>
<i>oxLDL</i> .....	<i>Oxidized Low Density Lipoprotein</i>
<i>PCR</i> .....	<i>Polymerase chain reaction</i>
<i>PCR-RFLP</i> .....	<i>PCR-Restriction Fragment Length Polymorphism</i>
<i>PGE2</i> .....	<i>Prostaglandin E2</i>
<i>ROS</i> .....	<i>Reactive oxygen species</i>
<i>RT-PCR</i> .....	<i>Real-time polymerase chain reaction</i>
<i>SCLE</i> .....	<i>Subacute cutaneous lupus erythematosus</i>
<i>SD</i> .....	<i>Standard Deviation</i>
<i>SIRT1</i> .....	<i>Silent Information Regulator Two Homolog 1</i>
<i>SLE</i> .....	<i>Systemic lupus erythematosus</i>
<i>SLEDAI</i> .....	<i>SLE Disease Activity index</i>
<i>SLICC</i> .....	<i>Systemic Lupus International Collaborating Clinics</i>
<i>Sn RNA</i> .....	<i>Small nuclear ribonucleoprotein</i>

# List of Abbreviations *cont...*

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<b>Abb.</b>	<b>Full term</b>
<i>SNECs</i> .....	<i>Secondary necrotic cells</i>
<i>SNPs</i> .....	<i>Single-nucleotide polymorphisms</i>
<i>SPSS</i> .....	<i>Statistical package for Social Science</i>
<i>SS</i> .....	<i>Systemic sclerosis</i>
<i>ss-DNA</i> .....	<i>Single stranded deoxyribonucleic acid</i>
<i>T1D</i> .....	<i>Type 1 Diabetes</i>
<i>TCR</i> .....	<i>T cell receptor</i>
<i>Th</i> .....	<i>T-helper</i>
<i>TLR</i> .....	<i>Toll like receptor</i>
<i>VIC</i> .....	<i>Victoria green fluorescent</i>
<i>WB</i> .....	<i>Western blotting</i>
<i>WHO</i> .....	<i>World Health Organization</i>

# INTRODUCTION

**S**ystemic lupus erythematosus (SLE) is a chronic severe multisystem autoimmune disease that affects multiple organs being characterized by heterogeneous manifestations that may affect the skin, joint, heart, brain, kidney, hematopoietic and central nervous systems. It is characterized by autoantibody production for a variety of self-antigens, but it is specifically associated with anti-double stranded DNA (anti-dsDNA), and immune complex deposition (*Olivares et al., 2018*).

The Lupus Foundation of America estimates that 1.5 million Americans, and at least five million people worldwide, have a form of lupus (*Radtchenko et al., 2018*).

Lupus nephritis (LN) is a major consequence of SLE and an important driver of morbidity and mortality. Approximately 40–70% of patients with SLE will develop LN (*Mohan and Putterman, 2015*). Renal assault during SLE is initiated by genes that breach immune tolerance and promote autoantibody production (*Wang et al., 2017*).

The Silent Mating Type Information Regulator 2 Homolog 1 (**SIRT1**) is a nicotinamide adenine dinucleotide (NAD)-dependent deacetylase enzyme that plays an important role in regulating a variety of cellular processes, such as energy metabolism, cell-cycle progression, apoptosis, aging, immune