Evaluation of the diagnostic role of non-coding RNA and Exosomal related gene association in lung cancer

Thesis

Submitted for Partial Fulfillment of the MD Degree

In Medical Biochemistry & Molecular Biology

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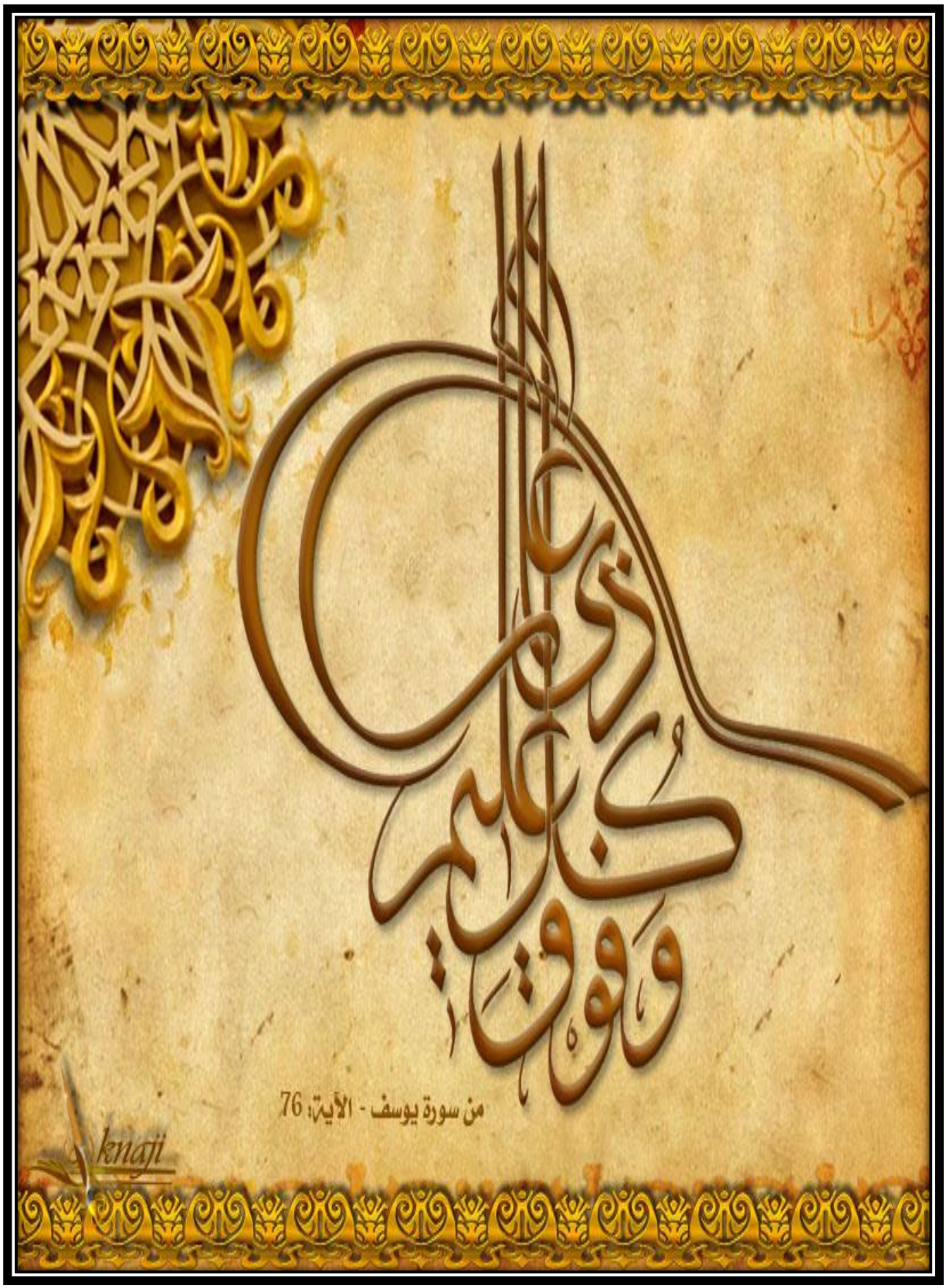
2018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ACKNOWLDGMENT

First, and foremost, I feel always indebted to ***Allah****, the most kind and the most merciful.*

Thanks to ***Allah*** *who lightened my path to become a humble student for a noble profession and granted me the ability to accomplish this work and support me in all my life.*

I would like to express my deepest gratitude to ***Prof. Dr. Fawzia Khalil Ibrahim,*** *Professor of Medical Biochemistry & Molecular biology, Faculty of Medicine, Ain Shams University, for her great support and encouragement throughout the whole work. It is a great honor to work under her guidance and supervision.*

My deepest appreciation and gratitude to ***Prof. Dr. Hanan Hussein Shehata,*** *Professor of Medical Biochemistry & Molecular biology, Faculty of Medicine, Ain Shams University, for her great support, encouragement and kind care throughout the whole work.*

My deepest appreciation to ***Dr. Marwa Ali,*** *Lecturer of Medical Biochemistry & Molecular biology, Faculty of Medicine, Ain Shams University, for her kind help and support in practical work.*

I would like to express my best regards and thanks to ***Dr Nehad Osman*** *Assistant Professor of Pulmonary Medicine, Faculty of Medicine, Ain Shams University, for her kind help and support in selecting proper samples.*

I would like to express my best regards and thanks to ***Dr Omar Abd el Rahman*** *Lecturer of Clinical Oncology and Nuclear Medicine, Faculty of Medicine, Ain Shams University, for her kind help and support in selecting proper samples.*

Words can never express my sincere thanks to ***My Family*** *for their continuous encouragement, generous support and love.*

Ghada Mohamed Gamal El- Din Ishak

LIST of CONTENTS

List of Tables

List of Figures

List of Abbreviations

Abbreviation	Meaning
ACCP	American College of Clinical Pharmacy
Alix	Anion Liquid Ion Exchange
ANRIL	Antisense Non-Coding RNA In The INK4 Locus
BAL	Bronchoalveolar Lavage
BMDCs	Bone-Marrow-Derived Cells
CD9	Clusters Of Differentiation
CDKN2B-AS1	CDKN2B Antisense RNA 1
cDNA	Complementary DNA
CEBPA	CCAAT Enhancer-Binding Protein Alpha
COPD	Chronic Obstructive Pulmonary Disease
CT	Computed Tomography
CXR	Chest X Ray
DEANR1	Definitive Endoderm-Associated Lncrna1
DEPC	Diethylpyrocarbonate
DNMTs	Dna Methyltransferases
ecCEBPA	Extra Coding CEBPA
EGF	Epidermal Growth Factor
EGFR	Epidermal Growth Factor Receptor
elncRNAs	Enhancer Long Non-Coding
EV	Exosomal Vesicle
Fas	First Apoptosis Signal
Fendrr	Fetal-Lethal Non-Coding Developmental Regulatory RNA
FGF	Fibroblastic Growth Factor
FOXA2	Forkhead Box A2
Foxf1	Forkhead Box F1

GAS5	Growth Arrest Specific 5
H3K27me	Methylated Lysine 27 On Histone 3
HeLa	Immortal Cell Line(Cervical Cancer)
HoxA	Homeobox A Cluster
Hsp	Heat Shock Protein
kb	Kilo-Base Pair
KCNQ1OT1	Antisense Transcript Of KCNQ1 Gene
KD	Knocked Down
KRAS	Kirsten Rat Sarcoma Virus.
lincRNAs	Long Intergenic Noncoding Rnas
MALAT1	Metastasis Associated Lung Adenocarcinoma Transcript 1
MCF-7	Michigan Cancer Foundation-7 (Breast Cancer Cell Line)
MEG3	Maternally Expressed Gene 3
MET	Mesenchymal To Epithelial Transition
miRNA	Microrna
MVBs	Multivesicular Bodies
MVEs	Multivesicular Endosomes
ncRNAs	Non-Coding RNA
ORF	Open Reading Frame
pancRNAs	Promoter-Associated Ncrnas
PCGEM1	Prostate-Specific Transcript (Non-Protein Coding) Prostate Cancer 2 Gene Expression Marker 1
PCR	Polymerase Chain Reaction
PET	Positron Emission Tomography
PI 3-kinase	Phosphatidylinositide 3-Kinase
Pnky	Long Intergenic Non-Protein Coding RNA PNKY
PRC2	Polycomb Repressive Complexes
PRNCR1	Prostate Cancer Associated Non-Coding RNA 1
PTBP1	Polypyrimidine Tract Binding Protein 1
RNA	Ribonucleic Acid

rpm	Revolutions Per Minute
RT-PCR	Real-Time Polymerase Chain Reaction
SChLAP	Second Chromosome Locus Associated With Prostate-1
SDS-PAGE	Sodium Dodecyl Sulfate Polyacrylamide *Gel* Electrophoresis
siRNA	Silent Interfering RNA
Slac2b	Synaptotagmin-Like Protein Homolog Lacking C2 Domains B
Slp4	Synaptotagmin-Like Protein 4
SMAD	SMA/MAD Homology
SNAREs	**SNA**P (Soluble NSF(N-Ethylmaleimide-Sensitive Factor) Attachment Protein) **Re**ceptor)
SVC	Superior Vena Cava
SWI/SNF	*Switch*/Sucrose Non-Fermentable
TIRF	Total Internal Reflection Fluorescensce
TNF	Tumor Necrosis Factor
tRNA	Transfer RNA
Tsg101	Tumor Susceptibility Gene 101 Protein
Wnt	Wingless-Type MMTV (Mouse Mammary Tumor Virus) Integration Site
Xi	Inactive X-Chromosomes In Females
Xist	X-Inactive Specific Transcript
Y RNA	Small Noncoding Rnas Fold Into Conserved Stem-Loop-Structure
µl	Microlitre

Introduction

Lung cancer is considered the highest cause of mortality among tumor pathologies worldwide **(*Cazzoli et al., 2013*)**. Most lung lesions are diagnosed at advanced stages with an overall 5-year survival rate of 15% **(*Siegel et al., 2011*)**.

There are no validated techniques for an early detection of pulmonary cancer lesions other than low-dose helical computed tomography scan. Unfortunately, this method has some negative effects. Furthermore, there are no serum/plasma biomarkers to determine whether a low-dose helical computerized tomogram should be performed in high-risk individuals **(*Cazzoli et al., 2013*)**. The identification of specific, sensitive and accurate tumor biomarkers that detect the presence of disease using noninvasive diagnostic procedures is a key part of cancer research.

It has been well known that tumor development is a multistage process to accumulate alterations at the genetic and/or epigenetic level which ultimately reprogramme a cell to undergo uncontrolled proliferation and metastasis **(*Gao et al., 2014*)**. The expression of initial mutations depends not only on the internal interaction between oncogenes but also on extracellular factors