

***PLASMA CIRCULATING HUMAN TELOMERASE
REVERSE TRANSCRIPTASE GENE AS A USEFUL
MARKER FOR EARLY DETECTION OF LUNG CANCER***

Thesis

*Submitted for Partial Fulfillment of Medical degree (M.SC.) in
Clinical and Chemical Pathology*

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2008

Abstract

Telomeres are specialized DNA–protein structures that cap the ends of linear chromosomes. Telomerase is a large ribonucleoprotein (RNP) complex that maintains telomeric DNA. Over 80% of human cancers show an activation of telomerase. The present study aimed to report the development of a quantitative assay for the measurement of hTERT expression in plasma of cancer lung patients based on real-time quantitative RT-PCR (qRT-PCR). The results of the study showed that the level of the enzyme in plasma increases in 73% of the study group. The sensitivity and the specificity were 73.7 & 90.0 respectively.

(Key Words):

(Telomerase enzyme – cancer lung- free RNA in plasma)

Acknowledgement

First and foremost, thanks to **ALLAH** the most kind, the most merciful and to whom any success is related.

No words can fulfill my deepest respect to **Prof. Dr. EBTESAM MOHAMMED FARID**, *Professor of Clinical and Chemical Pathology Faculty of Medicine, Cairo University*, for her motherly attitude, valuable guidance, scientific support and kind supervision.

I would like also to express my deepest respect to **Prof. Dr. MOHAMED MAHMOUD EL-BATANOUNY**, *Professor of Industrial Medicine and Occupational Diseases, Faculty of Medicine, Cairo University*, for his supervision, continuous encouragement and guidance.

I would like to express my deepest gratitude to **Dr. KHADIGA MOHAMED ABU-GABAL**, *Assistant Professor of Clinical and Chemical Pathology, Faculty of Medicine, Beni-Suef University*, for the idea and plan of the study in addition to her reliable advice and kind supervision in every step in this work

To establish this project, I'm indebted to many people. I would like to thank **Dr. MAHMOUD MOHAMED EL-BATANOUNY**, *Lecturer of Chest diseases, Faculty of Medicine, Beni-Suef University*, **Dr. MANAL MOHAMED KAMAL**, *Assistant Professor of Clinical and Chemical Pathology, Faculty of Medicine, Cairo University* & **Dr. YASER SHAABAN**, *Lecturer of Clinical and Chemical Pathology, Faculty of Medicine, Cairo University* for their support and guidance.

*To my family & my parents for without
their everlasting love, encouragement &
sacrifices, this work would never have
been completed*

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List of Abbreviation

53BP1	p53 Binding Protein 1
ADC	adenocarcinoma
ALT	alternative lengthening of telomere
ATM	ataxia telangiectasia mutated homolog
ATR	ataxia telangiectasia and Rad3 related
BLM,	Bloom syndrome
BRCA1	Breast Cancer Gene 1
BRCT motif proteins	Base Repair Cycle Time
CD	Cluster of differentiation
CD4 ⁺ cells	helper T-lymphocytes
CD8 cells	cytotoxic T-lymphocytes
cDNA	Complementary DNA
CEA	carcinoembryonic antigen
CHART	Continuous hyperfractionated accelerated radiotherapy
CHK1	CHeckpoint Kinase
CHK2	CHK2 checkpoint homolog
c-Myc	myelocytomatosis viral oncogene
CR4	CR4–CR5 domain of mammalian telomerase RNA
CR5	CR4–CR5 domain of mammalian telomerase RNA
cRNA	Complementary Ribonucleic Acid
CTL	cytotoxic T lymphocyte
Cy3	Cyanine 3
Cyfra 21-1	Cytokeratin 19 fragments
DCs	dendritic cells

DKC	Dyskeratosis congenita
DNA	Deoxyribose Nucleic Acid
DNA PK	DNA-dependent Protein Kinase
dNTP	Deoxynucleotid triphosphate
DSBs	double stranded breaks
dsDNA	double-stranded DNA
dTTP	deoxy thymidine triphosphate
dUTP	Deoxyuridine Triphosphate
ECOG PS	Eastern Cooperative Oncology Group Performance Status
EGFR	epidermal growth factor receptor
ELISA	The Enzyme-Linked ImmunoSorbent Assay
erb-b2	erythroblastic leukemia viral oncogene homolog 2
ER α	Estrogen receptor- α
FDG	Fluorodeoxyglucose
FDG-PET	Positron Emission Tomography
FISH	fluorescence in situ hybridization
FITC	fluorescein isothiocyanate
FNA	fine needle aspiration
FNAC	fine needle aspiration cytology
Gar1	gibberellin responsive1
GLUT4	insulin-responsive glucose transporter 4
Grb14	Growth factor receptor-bound protein 14
H/ACA	A ribonucleoprotein complex containing small nucleolar RNA of the box H/ACA type.
H2AX	H2A histone family, member X
H3-K9	histone H3-K9
HEK 293	Human Embryonic Kidney cells

HLA	human leukocyte antigen
HR	homologous recombinational repair
HRP-1	Hepatoma-Derived Growth Factor-Related Protein 1
hTERC	Human Telomerase RNA component
hTR	Human Telomerase RNA component
hTRT	Human Telomerase Reverse Transcriptase
HuVec	(human umbilical vein endothelial
IRAP	Interleukin-1 Receptor Antagonist Protein
IS	Internal standard
ISH	in situ hybridization
ISSLC	The International System for Staging Lung Cancer
ITAS	internal telomerase assay standard
Ki-67	A cell cycle and tumor growth marker which can be readily detected by immunocytochemistry methods. It is a nuclear antigen present only in the nuclei of cycling cells.
KPS	The Karnofsky Performance Status
Ku	is one component of a protein complex, Ku70 and Ku80, that functions as a heterodimer to bind DNA double-strand breaks and activates DNA-dependent protein kinase
Ku70	Ku70 is part of the non-homologous end joining (NHEJ) machinery involved in DNA double-stranded break (DSB) repair
Ku86	Ku86 is part of the non-homologous end joining (NHEJ) machinery involved in DNA double-stranded break (DSB) repair
MAPK	Mitogen-activated protein kinase
MDC1	Mediator of DNA damage checkpoint 1
MHC	major histocompatibility complex
MRE11	Meiotic recombination 11
Mre11	meiotic recombination 11

MRI	Magnetic Resonance Imaging
MRN	DNA damage repair complexMre11-Rad50-Nbs1
mRNA	Messenger RNA
Nbs1	Nibrin
NBS1	Nijmegen breakage syndrome 1(Mre11 complex subunit Nbs1)
NFBD1	nuclear factor with BRCT domains protein1
NHEJ	non-homologous DNA end-joining
Nhp2	non-histone chromosome protein 2
Nop10	nucleolar protein 10
NSCLC	Non-small-cell lung cancer
NSE	nucleotide sugar epimerase Neuron-specific enolase
p185(c-neu)	A cell surface protein-tyrosine kinase receptor that is found to be overexpressed in a significant number of adenocarcinomas.
P53	tumor suppressor protein p53
PAGE	Polyacrilamide gel electrophoresis
PARP	poly-ADP ribosylases
PCa	Prostate cancer
PCR	Polymerase chain reaction
PINX1	telomere length-control protein
PNA	peptide nucleic acid
POT1	protection of telomeres 1 homolog
PRINS	primed in situ labeling
RAP1	Repressor/Activator Protein: transcription factor
RecQ	ATP-dependent DNA helicase RecQ
RLT Buffer	RNeasy Lysis Buffer
RMN	RAD50-MRE11-NBS1

RNA	Ribose Nucleic Acid
RNP	ribonucleoprotein
RT-PCR	Reverse transcriptase-PCR
SCCA	Squamous Cell Carcinoma Antigen
SCLC	small cell lung carcinoma
snoRNPs,	small nucleolar ribonucleoproteins Small nucleolar RNAs
TANK1	Tankyrase 1(TRF1-interacting ankyrin-related ADP-ribose polymerase)
TANK2	Tankyrase 2 (TRF1-interacting ankyrin-related ADP-ribose polymerase)
Taz1	Tafazzin(transcriptional coactivator protein zinc-containing)
TBE	template boundary element
TBNA	Transbronchial needle aspiration
TER	Telomerase RNA component
TERC	Telomerase RNA component
TERT	Telomerase Reverse Transcriptase
TIN2	TRF 1-interacting nuclear factor 2
TNM staging	Tumor-no
TPA	tissue polypeptide antigen
TRAP	telomeric repeat amplification protocol
TRF	Telomeric repeat binding factor
TRF1	Telomere repeat binding factor-1
TRF2	Telomere repeat binding factor-2
TTNA	transthoracic needle aspiration biopsy
UNG	uracil-N-glycosylase
VEGF	vascular endothelial growth factor
WRN	WERNER SYNDROME ,Werner Syndrome helicase; Werner syndrome protein

WS	Werner Syndrome
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