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Assessment of MicroRNAs as Biomarkers of Hepatitis C Virus-associated Hepatocellular carcinoma in Egyptian Patients

Thesis Submitted for the partial fulfillment of Master Degree of Science (M.Sc.) in Biochemistry

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

وَهَلْ رَجَّزٌ كَذِبِي عَلَمًا

صَدَقَ اللَّهُ الْعَظِيمُ

Dedication

I dedicate this study to my mother, father, sister, grandmother aunt and my uncle's soul for their continual and unflagging patience, sympathy and support offered to me during all my life stages. Thank you my family. Your love and encouragement have made possible whatever success I have experienced in my professional career.

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List of Abbreviation

AASLD	American Association for the study of liver disease
ADAM10	A disintegrin and metalloprotease 10
AFP	α -fetoprotein
AFP-L3	lens culinaris agglutinin reactive fraction of AFP
AFU	Alpha- L –fucosidase
AGO	Argonaute family of proteins
AKT	Protein kinase B
ALB	Albumin
ALT	Alanine amino transferase
AP-1	Activator protein 1
APC	Adenomatous polyposis coli
AST	Aspartate amino transferase
AUC	Area Under Curve
BCL2	B cell lymphoma 2
BMF	proapoptotic protein B-cell lymphoma 2-modifying factor
C.elegans	<u>Caenorhabditis elegans</u>
cdk	Cyclin-dependent kinase
CDKI	Cyclin dependent kinase inhibitor
cDNA	complementary Deoxyribonucleic acid
CEA	Carcinoembryonic antigen
Cip/Kip	CDk interacting protein/ Kinase inhibitor protein
CLD	Chronic liver disease
CSDC2	cold-shock domain-containing protein C2
Ct	Comparative Cycle threshold
CT	Computed Tomography
CYR61	Cysteine-rich angiogenic inducer 61

DCP	Des-gamma-carboxyprothrombin
DM	Diabetes Mellitus
DNA	Deoxyribonucleic acid
EASL	European Association for the Study of Liver
EDRN	Early Detection Research Network
EGF	Epidermal growth factor
ELISA	Enzyme Linked Immunosorbent Assay
ERK	Extracellular signal related kinase
Exp 5	Exportin-5
FDA	Food and Drug Administration
FNA	Fine needle aspiration
GGT	Gamma-glutamyl transferase
GP73	Golgi protein 73
GPC3	Glypican-3
HBeAg	hepatitis B e antigen
HBsAg	Hepatitis B surface antigen
HBV	Hepatitis B virus
HCC	Hepatocellular carcinoma
HCCR	Human cervical cancer oncogene
HCV	Hepatitis C virus
HGF	Hepatocyte growth factor
HH	Hereditary Hemochromatosis
HIV	Human Immuno-deficiency Virus
HNF4A	Hepatocyte Nuclear Factor 4 Alpha
HOXD10	Homeobox D 10
HRPO/HRP	Horse Raddish Peroxidase
Ig	Immunoglobulin
IGF	insulin-like growth factor
IGF-II	insulin-like growth factor-II
MAP2K3	Mitogen-activated protein kinase-kinase 3

MAPK14	Mitogen activated protein kinase
MASPIN	Mammary Serine Protease Inhibitor
MDK	Midkine
MECC	Middle East Cancer Consortium
Mev	Multiple Experiment Viewer
miRISC	RISC loading complex
miRNAs	microRNAs
MMP9	Matrix metalloproteinase 9
MRI	Magnetic resonance imaging
mRNAs	messenger RNAs
mTOR	mammalian Target Of Rapamycin
MVB	multivesicular body
MVs	Microvesicles
MYC	Myelocytomatosis viral oncogene
NAFLD	Non-alcoholic fatty liver disease
NASH	Non-alcoholic steatohepatitis
NCI	National cancer institute
NPM1	Nucleophosmin 1
OD	Optical density
OLT	Orthotopic liver transplant
OPN	Osteopontin
PAK4	P-21 activated kinase 4
PAT	Parenteral antischistosomal therapy
PCD4	programmed cell death 4 protein
PCR	Polymerase chain reaction
PDCD4	Programmed Cell Death Protein 4
PDGFR	platelet-derived growth factor receptor
PI3K	Phosphatidyl Inositide 3 kinase
PIVKA II	Prothrombin induced by vitamin K absence II
PKm2	Pyruvate Kinase muscle isozyme 2

PPP2R2A	Protein-coding, protein phosphatase 2A subunit B
Pre-miRNA	Precursor miRNA
Pri-miRNA	Primary miRNA
PSA	prostate specific antigen
PTEN	phosphatase and tensin homolog
qRT-PCR	quantitative Reverse Transcription –Polymerase Chain Reaction
Ras	<u>R</u> at <u>s</u> arcoma
Rb	Retinoblastoma
REC	Research Ethics Committee
RHOB1	Ras-Homology gene family, member B
RISC	RNA-induced silencing complex
RNA	Ribonucleic acid
RNAa	RNA activation
RNAi	RNA-mediated interference
RNIX2	Runt-related transcription factor 2
ROC-curve	Receiver Operating Characteristics curve
RT	Reverse transcription
SCCA	Squamous cell carcinoma antigen
SELDI-TOF MS	Surface-enhanced laser desorption ionization time-of- flight mass spectrometry
SIRT 7	Sirtuin 7
Snail	Family of Zinc-finger proteins(transcription factor)
snoRNAs	small nucleolar RNAs
snRNAs	small nuclear RNAs
SPRY2	Sprouty 2
SPSS	Statistical Package for Social Science
STAT3	Signal transducer and activator of transcription 3
suPAR	Soluble urokinase plasminogen activator receptor
TAA s	Tumor-derived autoantibodies

TCF4	Transcription factor 4
TFs	Transcription factors
TGFB1	transforming growth factor β 1
TIMP3	Metalloproteinase inhibitor 3
TMB	Tetramethylbenzidine
TNFα	Tumor necrosis factor α
TRAIL-	TNF-related apoptosis-inducing ligand-
TRXs	Thioredoxins
US	Ultrasound
UTRs	Untranslated regions
VEGFR	Vascular endothelial growth factor receptor
v-Raf	Virus induced rapidly accelerated Fibrosarcoma
WHO	World health organization
2DE	2-dimension gel electrophoresis

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