Ain Shams University
Faculty of Science
Biochemistry Department

Evaluation of Antitumor Activity of Zinc Nanoparticles Suspension in an Ionic Liquid

A Thesis

Submitted for the degree of Master of Science as a partial fulfillment for requirements of the Master of Science

Submitted by

Mustafa Mahmoud Mohammed Elbakry

Biochemistry Demonstrator – Biochemistry department
B.Sc. in Biochemistry (2009) – Faculty of Science - Ain Shams University

Under Supervision of

Prof. Dr. Amina M. Medhat

Professor of Biochemistry
Biochemistry Department
Faculty of Science
Ain Shams University

Prof. Dr. AbdelFattah M. Badawi

Professor of Applied Surfactant Chemistry
Egyptian Petroleum Research Institute
Scientific Consultant for Science & Technology Center of Excellence

Dr. Eman I. Kandil

Assistant Professor of Biochemistry
Biochemistry Department
Faculty of Science
Ain Shams University

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Faculty of Science
Ain Shams University
2014

Declaration

I declare that this thesis has been composed and the work recorded here has been done by myself.

It has not been submitted for any other degree at this or any other university.

Mustafa Mahmoud

Dedication

In the name of Allah most gracious most merciful, Praise be to God, the Cherisher and Sustainer of the worlds.

I dedicate this thesis to my family and many friends. A special feeling of gratitude to my loving parents whose words of encouragement and push for tenacity ring in my ears, thank you very much for your love, endless support and encouragement. My brother and sister have never left my side and are always there for me thanks a lot.

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Contents

LIST OF ABBREVIATIONS

ALT	Alanine aminotransferase
AST	Aspartate aminotransferase
ATP	Adenosine triphosphate
CAT	Catalase
CDKs	Cyclin-dependent kinases
CPT	Camptothecin
EAC	Ehrlich ascites carcinoma
ECM	Extracellular matrix
ER	Estrogen receptor
ESC	Ehrlich solid carcinoma
GPx	Glutathione peroxidise
GSH	Reduced glutathione
HIF	Hypoxia-inducible factor
IC_{50}	The half maximal inhibitory concentration
ILs	Ionic liquids
LD_{50}	Median lethal dose
LP	Lipid peroxidation
MDA	Malondialdehyde
NF-κB	Nuclear factor kappa B
NK	Natural killer cells
NP	Nanoparticle
p53	Tumor protein 53
RNS	Reactive nitrogen species
ROS	Reactive oxygen species
RPM	Revolutions per minute

RPMI medium	Roswell Park Memorial Institute medium
SAR	Structure–activity relationship
SOD	Superoxide dismutase
TEM	Transmission electron microscopy
TNF-α	Tumor necrosis factor alpha
TP53	Tumor protein 53 gene
VACSERA	The holding company for biological products and vaccines
VEGF-A	Vascular endothelial growth factor-A

LIST OF FIGURES