



Faculty of Science  
Biochemistry Department

# **THE ANTI-PROLIFERATIVE EFFECT OF HESPERIDIN ON HEPATOCARCINOMA CELLS**

*A thesis*

*Submitted for the award of the degree of*

**Master of Science in Biochemistry**

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بسم الله الرحمن الرحيم

{ قالوا سبحانك لا علم لنا إلا ما

علمتنا إنك أنت العظيم }

صدق الله العظيم

سورة البقرة الآية ٣٢



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## *List of Abbreviations*

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### List of Abbreviations

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<b>AFB 1</b>	:	Aflatoxin B1
<b>AFP</b>	:	Alpha feto-protien
<b>ANOVA</b>	:	One-way analysis of variance
<b>cAMP</b>	:	Cyclic adenosine monophosphate
<b>CCl4</b>	:	Carbon tetrachloride
<b>cDNA</b>	:	Complementary Deoxyribonucleic acid
<b>CO<sub>2</sub></b>	:	Carbon dioxide
<b>CSCs</b>	:	Cancer stem cells
<b>CSF</b>	:	Colony stimulating factor
<b>CT</b>	:	Cycle threshold
<b>DMSO</b>	:	Dimethyl sulfoxide
<b>DNA</b>	:	Deoxyribonucleic acid
<b>dNTPs</b>	:	Nucleosides triphosphate
<b>EDTA</b>	:	Ethylenediaminetetraacetic acid
<b>EpCAM</b>	:	Epithelial cell adhesion molecule
<b>ESCs</b>	:	Embryonic stem cells
<b>FBS</b>	:	Fetal bovine serum
<b>HBsAg</b>	:	Hepatitis B surface antigen
<b>HBV</b>	:	Hepatitis B virus
<b>HCC</b>	:	Hepatocellular carcinoma
<b>HCV</b>	:	Hepatitis C virus
<b>HCV-Ab</b>	:	Hepatitis C virus antibody
<b>HDL</b>	:	High density lipoproteins
<b>HepG2</b>	:	Human hepatoma cell line
<b>ICC</b>	:	Intrahepatic cholangiocarcinoma
<b>IκB</b>	:	Inhibitors of NF-κB
<b>IKK</b>	:	I kappa-B kinase
<b>IL-1</b>	:	Interleukin-1
<b>LDL</b>	:	Low density lipoproteins
<b>LPS</b>	:	Lipopolysaccharide
<b>MEIA</b>	:	Microparticle enzyme immunoassay

## *List of Abbreviations*

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<b>MMP</b>	:	Matrix metalloproteases
<b>NAFLD</b>	:	Non-alcoholic fatty liver disease
<b>NALM_6</b>	:	Human pre-B cell leukemia
<b>NASH</b>	:	Non-alcoholic steatohepatitis
<b>NCI</b>	:	National cancer institute
<b>NEMO</b>	:	NF- $\kappa$ B essential modulator
<b>NF-<math>\kappa</math>B</b>	:	Nuclear factor- kappa B
<b>NIK</b>	:	NF- $\kappa$ B-inducing kinase
<b>P</b>	:	A probability
<b>PBS</b>	:	Phosphate buffer solution
<b>PCR</b>	:	Polymerase chain reaction
<b>Rel</b>	:	Reticulo endotheliosis
<b>RNA</b>	:	Ribonucleic acid
<b>RT-PCR</b>	:	Real-Time polymerase chain reaction
<b>RV</b>	:	Reaction Vessel
<b>SD</b>	:	Standard deviation
<b>SNU-C4</b>	:	Human colon cancer cells
<b>TLRs</b>	:	Toll-like receptors
<b>TNF</b>	:	Tumor necrosis factor
<b>TPA</b>	:	12-O-tetradecanoyl-phorbol-13-acetate
<b><math>\bar{x}</math></b>	:	mean

## *List of Tables*

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