



# **Potential Cytoprotective Activity of some Natural and Synthetic Compound(s) against Chemically-Induced Injury in Human Hepatocytes**

A Thesis Submitted to Ain Shams University in Partial Fulfillment of the Requirements for the  
Master degree in Pharmaceutical Sciences  
(Pharmacology and Toxicology)

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

سَنُرِيهِمْ آيَاتِنَا فِي الْأَفَاقِ وَفِي أَنْفُسِهِمْ  
حَتَّىٰ يَتَبَيَّنَ لَهُمْ أَنَّهُ الْحَقُّ ۗ أَوَلَمْ يَكْفُفْ  
بِرَبِّكَ أَنَّهُ عَلَىٰ كُلِّ شَيْءٍ شَهِيدٌ

صدق الله العظيم

سورة فصلت آية ٥٣



## **Pre-Requisite Post-Graduate Courses**

Besides the work presented in this thesis, the candidate has attended the following courses:

1. Pharmacology
2. Clinical Pharmacology and Therapeutics
3. Toxicology
4. Selected Topics
5. Computer Science
6. General and Physical Chemistry
7. Biostatistics
- 8- Instrumental Analysis

She has successfully passed examination in these courses with general grade *Very Good*.

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# *Dedication*

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## LIST OF ABBREVIATIONS

<b>ALT</b>	Alanine aminotransferase
<b>AOM</b>	Azoxymethane
<b>AR</b>	Androgen Receptor
<b>AST</b>	Aspartate aminotransferase
<b>BPH</b>	Benign Prostate Hypertrophy
<b>CAT</b>	Catalase Enzyme
<b>CCl<sub>4</sub></b>	Carbon tetrachloride
<b>Didox</b>	3, 4-Dihydroxybenzohydroxamic acid
<b>dNTP</b>	Deoxyribonucleoside Triphosphates
<b>ER+</b>	Estrogen receptor positive
<b>ER-</b>	Estrogen Receptor – alpha
<b>ER-</b>	Estrogen Receptor – beta
<b>GSH</b>	Reduced Glutathione
<b>IL-1</b>	Interleukin – one beta
<b>IL-6</b>	Interleukin – 6
<b>iNOS</b>	Inducible NO synthase
<b>LPS</b>	Lipopolysaccharide
<b>MDA</b>	Malondialdehyde
<b>NF- B</b>	Nuclear Factor – kappa B
<b>NHE</b>	Na <sup>+</sup> -H <sup>+</sup> exchange
<b>NO</b>	Nitric Oxide
<b>PKC-</b>	Protein kinase C-alpha
<b>PSA</b>	Prostate specific antigen
<b>RNR</b>	Ribonucleotide Reductase
<b>ROS</b>	Reactive oxygen species
<b>SOD</b>	Superoxide Dismutase
<b>SUR</b>	Sulfonylurea Receptor
<b>TBARS</b>	Thiobarbituric acid reactive substance
<b>TGF-</b>	Transforming growth factor – beta
<b>TNF-</b>	Tumor necrosis factor – alpha



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