

بسم الله الرحمن الرحيم





شبكة المعلومات الجامعية التوثيق الالكتروني والميكروفيلم



جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات



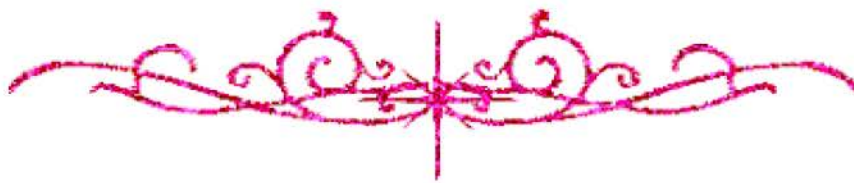
يجب أن

تحفظ هذه الأقراص المدمجة بعيدا عن الغبار





بعض الوثائق الأصلية تالفة





بالرسالة صفحات
لم ترد بالأصل





Cairo University
Faculty of Science

BIOCHEMICAL STUDIES ON THE EFFECT OF TURMERIC ON BREAST CANCER OF RATS

Presented by

Rania Mortada Mahmuod Mahmuod
(B.Sc. 2006)

**Thesis Submitted for Partial fulfillment
of Master Degree in Biochemistry**

**Chemistry Department
Faculty of Science
Cairo University**

2010

Abstract

Name: Rania Mortada Mahmod Mahmod

Title of Thesis: - Biochemical Studies On The Effect Of Turmeric On Breast Cancer Of Rats.

In this study, we investigated the anti-tumor potential of turmeric for 120 days against injected intraperitoneally a single dose of (10 mg/rat) 7, 12-dimethylbenz (a) anthracene (DMBA)-induced oxidative stress and mammary carcinogenesis in female rats. The treatment protocol started from the day immediately after DMBA admission. Results indicated that administration of DMBA was associated with development of mammary carcinoma, elevated levels of markers of tumorigenicity, endocrine derangement, and oxidative stress, which ameliorated with the administration of 5% turmeric of rat's diet. It has been demonstrated that their ability to minimize the frequency of DMBA-induced carcinomas, decrease the deleterious endocrine derangement and decrease the level of detrimental oxidative stress. These findings suggest possible protective and therapeutic implications in mammary carcinogenesis. In conclusion, these results suggested that supplementation of diet with turmeric provided antioxidant defense with strong chemo preventive activity against DMBA-induced mammary tumors.

Keywords: Breast cancer, curcumin, nitric oxide, malondialdehyde, CEA, TSA, estradiol

Supervisors:

- 1- Dr. Victorine B. Baghous
- 2- Dr. Abdou O. Abdelhamid
- 3- Dr. Soha M. Hamdy

Signature:

Prof. Dr. Mohamed M. Shoukry
Chairman of Chemistry department
Faculty of Science- Cairo
University

APPROVAL SHEET FOR SUBMISSION

Thesis Title: BIOCHEMICAL STUDIES ON THE EFFECT OF TURMERIC ON BREAST CANCER OF RATS.

Name of candidate: Rania Mortada Mahmud Mahmud

This thesis has been approved for submission by the supervisors:

1- Prof. Dr. Victorine B. Baghous

Professor of organic chemistry- Chemistry Department
Faculty of Science- Cairo University.

Signature:

2- Prof. Dr. Abdou O. Abdelhamid

Professor of organic chemistry- Chemistry Department
Faculty of Science- Cairo University.

Signature:

3-Prof. Dr. Soha M. Hamdy

Assistant prof. of Biochemistry-Biochemistry Division
Chemistry Department - Faculty of Science, Fayoum University.

Signature:

Prof. Dr. Mohamed M. shoukry

Chairman of Chemistry Department
Faculty of Science- Cairo University

Approval Sheet

BIOCHEMICAL STUDIES ON THE EFFECT OF TURMERIC ON BREAST CANCER OF RATS.

By

Rania Mortada Mahmuod Mahmuod

Bachelor of Science, Chemistry Department, Biochemistry
Division, Faculty of Science, Fayoum University

This thesis for M. Sc degree has been

Approved by:

Prof. Dr. Stefano Ferrari

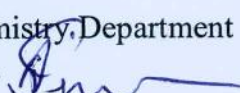
Professor of Biochemistry in Institute of Molecular Cancer Research,
University of Zurich.

Prof. Dr. Ehab Moustafa Mohamed Ali

Professor of Biochemistry, Chemistry Department, Science Faculty, Tanta
University

Prof. Dr. Abdou O. Abdelhamid

Professor of organic chemistry- Chemistry Department
Faculty of Science- Cairo University.



2010

Beside the work carried out in this thesis the candidate had passed postgraduate studies for partial fulfillment of M.Sc degree in the following topics:

- | | |
|-----------------------------|--------------------------|
| 1 - Biochemistry I | 11 - Physiology I |
| 2 - Biochemistry II | 12- Physiology II |
| 3 - Enzymology | 13 - Biological analysis |
| 4 - Toxicology | 14 - Cytology |
| 5 - Molecular biology | 15 -Microbiology |
| 6 - Tissue culture | 16 - Radiology |
| 7 - Industrial microbiology | 17 - Spectrochemistry |
| 8 - Immunochemistry | 18 - Stereochemistry |
| 9 - Immunology | 19 - |
| Inorganic chemistry complex | |
| 10 - Body fluid | 20 - Biostatics |
| | 21 - Germany |

Prof. Dr. Mohamed M. shoukry

Chairman of Chemistry Department
Faculty of Science- Cairo University

ACKNOWLEDGMENT

First and Foremost, Thanks are Due to Allah

*I would like to express my deepest gratitude and sincere thanks to **Dr. Victorine Beshara Baghous**, Professor of organic chemistry, Chemistry Department, Faculty of Science, Cairo University for her valuable support, kind encouragement unfailing advice kind assistance and sincere guidance.*

*I would like to express my deepest gratitude and sincere thanks to **Dr. Abdou Osman Abdelhamid**, Professor of organic chemistry Chemistry Department, Faculty of Science, Cairo University for his valuable guidance and supervision throughout this investigation*

*Whatever I say or write, I will never be able to express my deep feelings and profound gratitude to **Dr. Soha Mohamed Hamdy**, Assistant professor of Biochemistry, Chemistry Department, Biochemistry Division, Faculty of Science, Fayoum University for suggesting the point of work and performing it under her valuable supervision. My sincere thanks for her encouragement and her generous help and constructive and sincere guidance during the planning and the editing of this thesis.*

*I would like to express my deepest gratitude and sincere thanks to **Dr. Abdel Karim Mohammed**, lecturer of Cytology and Histology, Zoology Department, Faculty of Science, Fayoum University, for his continuous help offering all facilities for the laboratory work and his continuous guidance and encouragement during the progress of this work*

I never forget sacrifice given by my mother, father, sisters, brothers, and no words can express my gratitude to my husband for his never ending support and care.

LIST OF ABBREVIATION

AhR	aryl hydrocarbon receptor
AMC	Atypical Medullary Carcinoma
AP-1	Activating protein-1
ATPase	Adenosine triphosphatase
BDMC	Bisdemethoxycurcumin
b-FGF	basic fibroblast growth factor
CEA	Carcinoembryonic antigen
COX-I	Cyclooxygenase-I
COX-II	Cyclooxygenase-II
DBM	dibenzoylmethane
DCIS	Ductal carcinoma in situ
DES	Diethylstilbestrol
DMBA	7,12-dimethylbenz[a]anthracene
DMC	Demethoxycurcumin
DMSO	Dimethyl Sulfoxide
DNA	Deoxy ribonucleic Acid
E2	Estradiol
EGF	Epidermal growth factor
EGFRK	Epidermal growth factor receptor- kinases
ELISA	Enzyme-linked immunosorbent assay
ERK	Extracellular receptor kinase
ER α	Alpha Estrogen Receptor
ER β	Beta Estrogen Receptor
FDA	Food and Drug Administration
FPTase	Farnesyl-protein transferase

GCL	Glutamyl cysteine ligase
GPx	Glutathione peroxidase
GSH	Glutathione reduced
GSH	Glutathione
GSSG	Glutathione oxidized
GST	Glutathione S-Transferases
H&E	Haematoxylin and eosin
HDS1	Dehydrogenase type 1
HER-2	Human epidermal growth factor receptor-2
HGF	Hepatocyte growth factor
HRP	Horseradish peroxidase
HRT	Hormone replacement therapy
IBC	Inflammatory breast cancer
IDC	Invasive ductal carcinoma
IGF-1	Insulin-like growth factor-1
IL	Interleukin
IL-2	Interleukin-2
IL-8	Interleukin-8
ILC	Infiltrating lobular carcinoma
IMC	Invasive micropapillary carcinoma
iNOS	Inducible nitric oxide oxidase
JAK	Janus kinase
JNK	C-Jun N-terminal kinase
LOX	Lipoxygenase
MC	Medullary carcinoma
MCP	Monocyte chemoattractant protein
MDA	Malondialdehyde

MDR	Multidrug-resistant
MIP	Macrophage inflammatory protein
MMP	Matrix metalloproteinase
mRNA	Messenger Ribonucleic Acid
MRP2	Multidrug resistance-associated protein 2
MSA	Methylseleninic acid
N.S	Non significant
NANA	N-acetylneuraminic acid
NF- κ B	Nuclear Factor- κ B
NGF	Nerve growth factor
NNMT	Nicotinamide N-methyltransferase
NO	Nitric oxide
NQO	Dehydrogenase quinone
NRF-2	Nuclear factor 2-related factor
ODC	Ornithine decarboxylase
ppm	Parts per million
PAHs	Polycyclic Aromatic Hydrocarbons
PDGF	Platelet-derived growth factor
PDR	Physicians Desk Reference
PE	Phytoestrogen
PKC	Protein kinases
PPAR- γ	Peroxisome proliferator-activated receptor-gamma
RBCs	Red Blood Cells
RNA	Ribonucleic Acid
ROS	Species Reactive Oxygen
S.D	Standard deviation
S.E	Standard error

SA	Sialic Acid
SCC	Squamous cell carcinoma
SOD	Superoxide dismutase
STAT3	Signal transducers and activators of transcription
TBA	Thiobarbituric acid
TBARS	Thiobarbituric acid reactive species
TC	Tubular carcinoma
TCA	Trichloroacetic acid
TDLU	Terminal ductal lobular unit
THC	Tetrahydrocurcumin
TIM	tissue inhibitor of metalloproteinase
TIMP-1	Tissue inhibitor of metalloproteinase-1
TMB	3, 3', 5, 5' tetramethylbenzidine
TNF	Tumor necrosis factor
TNF- α	Tumor necrosis factor – alpha
TSA	Total Sialic Acid
VEGF	vascular endothelial growth factor