

# **ANTIOXIDANT EFFECT OF SULFUR BATHS IN PATIENTS WITH Primary OSTEOARTHRITIS**

*Thesis*

**Submitted for Partial Fulfillment of Master Degree in  
Physical Medicine and Rehabilitation**

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**2012**

# Acknowledgement

*I wish to thank and to express my sincere gratitude to **Prof. Dr. Mervat Abd El-Hamid Reda** Professor of Physical Medicine, Rheumatology and Rehabilitation, Faculty of Medicine, Ain Shams University, for her indispensable guidance and keen suggestion in supervising the work. Her constructive encouragement, unforgettable help, tremendous efforts and support every step were behind the accomplishment of this work.*

*I wish to thank **Prof. Dr. Mona Abdullah El-Sebaie** Professor of Physical Medicine, Rheumatology and Rehabilitation, Faculty of Medicine, Ain Shams University, for the valuable time, the great efforts she has given to me and her continuous guidance and encouragement in preparing this study.*

*I am also deeply grateful to **Dr. Rana Ahmed El-Hilaly** Lecturer of Physical Medicine, Rheumatology and Rehabilitation, Faculty of Medicine, Ain Shams University, for her help in performing this work and the great efforts she has given to me.*

**Shaimaa Osman Abd El-Rahim**

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## ***List of abbreviation***

**ACT** : Autologous chondrocyte transplantation

**ACTH** : Adrenocorticotrophic hormone

**AP-1** : Activator protein -1

**ARE** : Antioxidant response element

**BMI** : Body mass index

**CAT** : Catalase

**CD** : Cluster of differentiation

**CoQ10** : Ubiquinol

**Cu/ZnSOD** : Copper-zinc superoxide dismutase

**Da** : Dalton

**ECSOD** : Extracellular superoxide dismutase

**eGPx** : Epididymal Glutathione peroxidase

**eNOS** : Endothelial nitric oxide synthase

**EPR** : Electron paramagnetic resonance

**ESR** : Erythrocyte sedimentation rate

**EULAR** : European League Against Rheumatism

**Fe** : Ferritin (Iron)

**GCL** : Glutamylcysteine ligase

**GCLC** : Heavy catalytic subunit of Glutamylcysteine  
ligase

**GCLM** : Light modifier subunit of Glutamylcysteine ligase

**GH** : Growth hormone

**GPxs** : Glutathione peroxidase enzymes

**GR** : Glutathione reductase

**Grx** : Glutaredoxin

**GSH** : Glutathione

**GSS** : Glutathione synthetase

**GST** : Glutathione S-Transferase

<b>GULO</b>	:	Gulonolactone oxidase
<b>H<sub>2</sub>O<sub>2</sub></b>	:	Hydrogen peroxide
<b>HDL</b>	:	High-density lipoprotein
<b>HO</b>	:	Heme Oxygenase
<b>HOCl</b>	:	Hypochlorous acid
<b>IL</b>	:	Interleukin
<b>IL-1R</b>	:	Interleukin -1 receptor
<b>Keap1</b>	:	Kelch-like ECH-associated protein 1
<b><math>\alpha</math>LA</b>	:	$\alpha$ -Lipoic Acid
<b>LDL</b>	:	Low-density lipoprotein
<b>LIF</b>	:	Leukemia inhibitory factor
<b>LO.</b>	:	Alkoxy radical
<b>LOO.</b>	:	Peroxy radical
<b>LOOH</b>	:	Lipid hydroperoxide
<b>MAPEG</b>	:	Membrane-associated proteins in eicosanoid and glutathione metabolism

<b>MMPs</b>	:	Matrix metalloproteases
<b>Mn</b>	:	Manganese
<b>MnSOD</b>	:	Manganese Superoxide dismutase
<b>Msr</b>	:	Methionine Sulfoxide Reductase
<b>MT</b>	:	Metallothionein
<b>μM</b>	:	Micromolar
<b>NF- B</b>	:	Nuclear factor kappa-B
<b>nM</b>	:	Nanomolar
<b>NO</b>	:	Nitric oxide
<b>-NO</b>	:	Nitroso
<b>NO<sub>2</sub></b>	:	Nitrogen dioxide
<b>Nrf</b>	:	Nuclear factor-erythroid 2 p45-related factor
<b>NSAID</b>	:	Non-steroidal anti-inflammatory drugs
<b><sup>1</sup>O<sub>2</sub></b>	:	Singlet oxygen
<b>O<sub>2</sub><sup>-</sup></b>	:	Superoxide anion
<b>O<sub>3</sub></b>	:	Ozone



<b>OA</b>	:	Osteoarthritis
<b>OARSI</b>	:	Osteoarthritis research Society International
<b>OCT</b>	:	Autologous osteochondral transplantation
<b>OH</b>	:	Hydroxyl radical
<b>ONOO-</b>	:	Peroxynitrite
<b><math>\alpha</math> PBN</b>	:	$\alpha$ -phenyl-tert-butyl nitron
<b>PGE2</b>	:	Prostaglandin E2
<b>PGOA</b>	:	Primary generalized osteoarthritis
<b><i>PHGPx</i></b>	:	Phospholipid hydroperoxide Glutathione peroxidase
<b><i>PICOT</i></b>	:	Protein kinase C interacting cousin of thioredoxin
<b>PON</b>	:	Paraoxonase
<b><i>Prx</i></b>	:	Peroxiredoxin
<b>Prxs</b>	:	Peroxiredoxins
<b>RA</b>	:	Rheumatoid arthritis

<b>RF</b>	:	Rheumatoid factor
<b>RNS</b>	:	Reactive nitrogen species
<b>ROS</b>	:	Reactive oxygen species
<b>SADOA</b>	:	Slow-acting drugs for osteoarthritis
<b>SF</b>	:	Synovial fluid
<b>SO<sub>4</sub></b>	:	Sulphates
<b>SOD</b>	:	Superoxide dismutase
<b>SODs</b>	:	Superoxide dismutase enzymes
<b>Srx</b>	:	Sulfiredoxin
<b>SYSADOA</b>	:	Symptomatic slow-acting drugs for osteoarthritis
<b>TAC</b>	:	Total antioxidant capacity
<b>TGR</b>	:	Thioredoxin glutathione reductase
<b>TNF</b>	:	Tumor necrosis factor
<b>TrxR</b>	:	Thioredoxin Reductase
<b>Trx</b>	:	Thioredoxin

**$\alpha$  –TTP** :  $\alpha$  -tocopherol transfer protein

**Txnip** : Thioredoxin interacting protein

**WBC** : White blood cells

**WOMAC** : Western Ontario and McMaster Universities  
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