

# *Free Radical Pathology in Neuropsychiatric Disorders*

*Essay submitted for partial fulfillment of the M.Sc.  
Degree in Neuropsychiatry*

**Presented by**  
**MONA IBRAHIM AWAAD**  
*M.B., B.Ph.*

**Under the supervision of**

**PROF. DR. MONA ABDEL HAMID RAAFAT**

*Professor of Neurology  
Faculty of Medicine-Ain Shams University*

**DR. MAGD FOUAAD ZAKARIA**

*Assistant Professor of Neurology  
Faculty of Medicine-Ain Shams University*

**DR. AIDA SEIF EL-DAWLA**

*Assistant Professor of Psychiatry  
Faculty of Medicine-Ain Shams University*

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يسم الله الرحمن الرحيم  
قالوا سبحانك لا علم لنا إلا ما علمتنا  
إنك أنت العظيم الحكيم  
صدق الله العظيم  
(سورة البقرة الآية ٣٢)





To My  
Beloved  
Family



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**Mona Ibrahim**

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## *List of Abbreviations*

**2-TBA:** 2-thiobarbituric acid  
**6-OHDA:** 6-Hydroxydopamine  
**AB:** amyloid- $\beta$ -peptide  
**AIMS:** abnormal involuntary movement scale  
**ALS:** Amyotrophic lateral sclerosis  
**AMPA/kainate receptor:** alpha-amino-3-hydroxy-5-methyl-4-isoxazole propionic acid/kainate receptor  
**APP:** amyloid precursor protein  
**ATP:** Adenosine triphosphate  
**BIDIP:** 1,3 bis(dimethylamino)-2-propanol  
**Ca<sup>2+</sup>:** calcium  
**Cl:** chloride  
**Co-Q:** co-enzyme Q  
**CPH:** centrophenoxine  
**CSF:** cerebrospinal fluid  
**CT:** computerized tomography  
**Cu(I):** cuprous  
**Cu(II):** cupric  
**Cu-Zn SOD:** copper-zinc superoxide dismutase  
**DMAE:** dimethyl-amino-ethanol  
**DNA:** Deoxyribonucleic acid  
**EAA:** excitatory amino acid  
**EDRF:** endothelium derived relaxing factor  
**EpR:** electron paramagnetic resonance  
**ESR:** electron spin resonance  
**Fe<sup>2+</sup>:** ferrous  
**Fe<sup>3+</sup>:** ferric  
**GABA:** gamma-amino butyric acid  
**GSH:** glutathione peroxidase

***GSSG: oxidized glutathione***  
***GTP: guanine triphosphate***  
***H<sub>2</sub>O: water***  
***H<sub>2</sub>O<sub>2</sub>: hydrogen peroxide***  
***IREs: iron-responsive elements***  
***IRF: Iron regulatory factor***  
***IU: International unit***  
***K<sup>+</sup>: potassium***  
***MAO: mono-amine oxidase***  
***Mn-SOD: manganese superoxide dismutase***  
***MPP<sup>+</sup>: 1-methyl-4-phenyl pyridine***  
***MPTP: 1-methyl-4-phenyl-1,2,3,6-tetrahydropyridine***  
***MRI: magnetic resonance imaging***  
***mRNA: Messenger ribonucleic acid***  
***mtDNA: mitochondrial DNA***  
***Na<sup>+</sup>: sodium***  
***NADPH: nicotinamide-adenine dinucleotide phosphate***  
***nDNA: nuclear DNA***  
***NH<sub>3</sub>: Ammonia***  
***NMDA: N-methyl-D-aspartate***  
***NO<sup>•</sup>: nitric oxide***  
***NOS: nitric oxide synthase***  
***NSAIDs: non steroidal anti-inflammatory drugs.***  
***O<sub>2</sub>: Molecular oxygen***  
***O<sub>2</sub><sup>-</sup>: Superoxide***  
***OH<sup>•</sup>: hydroxyl radical***  
***ONOO<sup>•</sup>: peroxynitrite***  
***ONOOH: peroxynitrous acid***  
***OOH<sup>•</sup>: perhydroxyl radical***  
***PBN: phenyl butyl nitrone***

***PrPc: Prion protein***

***RAGE: receptor for advanced glycation end products.***

***RO<sup>•</sup>: alkoxy radical***

***ROO<sup>•</sup>: peroxy-radical***

***SOD: superoxide dismutase***

***TBARS: thiobarbituric acid reactive substances.***

***VTA: ventral tegmental area***



## *List of Figures*

	<i>Page No.</i>
<i>Figure (1): Sequential reduction of molecular oxygen by one-electron transfer.</i>	<b>6</b>
<i>Figure (2): Tissue injury and oxidative stress.</i>	<b>29</b>
<i>Figure (3): Pathological changes during aging.</i>	<b>48</b>
<i>Figure (4): Cascade of changes leading to stroke.</i>	<b>94</b>

