



شبكة المعلومات الجامعية
التوثيق الإلكتروني والميكروفيلم

بسم الله الرحمن الرحيم



MONA MAGHRABY



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جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

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Flow Cytometric Quantitation of Procoagulant Microparticles and Erythrocyte Phosphatidylserine Exposure in B-Thalassemia Patients Thesis

*Submitted for Partial Fulfillment of M.D. Degree in
Clinical and Chemical Pathology*

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قالوا

سبحانك لا علم لنا
إلا ما علمتنا إنك أنت
العليم العليم

صدق الله العظيم

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List of Abbreviations

Abb.	Full term
μl :	<i>Microliter</i>
$\mu\text{-NMR}$:	<i>Micro-nuclear magnetic resonance</i>
2, 3- BPG:	<i>2, 3- biphosphoglycerate</i>
ACS:	<i>Acute coronary syndrome</i>
AFM:	<i>Atomic force microscopy</i>
ALT:	<i>Alanine transferase enzyme</i>
APLS:	<i>Antiphospholipid syndrome</i>
ASAXS:	<i>Anomalous small-angle X-ray scattering</i>
AST:	<i>Aspartate aminotransferase enzyme</i>
AUC:	<i>Area under curve</i>
BCM:	<i>Below costal margin</i>
BMT:	<i>Bone marrow transplantation</i>
CAP:	<i>Catabolite activator protein</i>
CBC:	<i>Complete blood count</i>
CCV:	<i>Clathrin-coated vesicles</i>
CD:	<i>Cluster of differentiation</i>
CD40L:	<i>CD40 ligand</i>
CEACAM:	<i>Carcinoembryonic antigen related cell adhesion molecule</i>
cGMP:	<i>Cyclic guanosine monophosphate</i>
CHD:	<i>Coronary heart disease</i>
Cm:	<i>Centimeter</i>
CNS:	<i>Central nervous system</i>
CO ₂ :	<i>Carbon dioxide</i>
COPD:	<i>Chronic obstructive pulmonary disease</i>
Cryo EM:	<i>Cryo electron microscopy</i>
DIC:	<i>Disseminated intravascular coagulation</i>

List of Abbreviations (Cont...)

Abb.	Full term
<i>dl:</i>	<i>Deciliter</i>
<i>DLS:</i>	<i>Dynamic light scattering</i>
<i>DPG:</i>	<i>Diphosphoglycerate</i>
<i>ELAM-1:</i>	<i>Endothelial leukocyte adhesion molecule-1</i>
<i>ELISA:</i>	<i>Enzyme-linked immunosorbent assay</i>
<i>EMH:</i>	<i>Extramedullary hematopoiesis</i>
<i>EMPs:</i>	<i>Endothelial MPs</i>
<i>EPO:</i>	<i>Erythropoietin</i>
<i>ER:</i>	<i>Endoplasmic reticulum</i>
<i>ERFE:</i>	<i>Erythroferrone</i>
<i>ErMPs:</i>	<i>Erythrocyte MPs</i>
<i>F VII:</i>	<i>Factor VII</i>
<i>F VIIa:</i>	<i>Active factor VII</i>
<i>FCM:</i>	<i>Flow cytometry</i>
<i>Fe²⁺:</i>	<i>Iron in the ferrous state</i>
<i>FFP:</i>	<i>Fresh frozen plasma</i>
<i>FITC:</i>	<i>Fluorescein isothiocyanate</i>
<i>fl:</i>	<i>Femtoliter</i>
<i>FSC:</i>	<i>Forward scatter</i>
<i>GC:</i>	<i>Guanylate cyclase</i>
<i>GLA:</i>	<i>γ-carboxyglutamic acid</i>
<i>gm:</i>	<i>Gram</i>
<i>GP:</i>	<i>Glycoprotein</i>
<i>GTP:</i>	<i>Guanosine triphosphate</i>
<i>GWAS:</i>	<i>Genome - wide association studies</i>
<i>HAs:</i>	<i>Hemolytic anemias</i>
<i>Hb:</i>	<i>Hemoglobin</i>

List of Abbreviations (Cont...)

Abb.	Full term
<i>HbBart's:</i>	<i>Hemoglobin Bart's</i>
<i>HbF:</i>	<i>Fetal Hb</i>
<i>HbH:</i>	<i>Hemoglobin H</i>
<i>HbS:</i>	<i>Hemoglobin S</i>
<i>HCO₃⁻:</i>	<i>Bicarbonate ions</i>
<i>HCV:</i>	<i>Hepatitis C virus</i>
<i>hHPFH:</i>	<i>Heterocellular HPFH</i>
<i>HIT:</i>	<i>Heparin-induced thrombocytopenia</i>
<i>HPFH:</i>	<i>Hereditary persistence of fetal Hb</i>
<i>HS:</i>	<i>Highly significant</i>
<i>hs-FCM:</i>	<i>High-sensitivity flow cytometer</i>
<i>ICAM:</i>	<i>Intercellular adhesion molecule</i>
<i>ICAM-1:</i>	<i>Intercellular adhesion molecule-1</i>
<i>ID1:</i>	<i>Inhibitor of DNA binding 1 protein</i>
<i>IDA:</i>	<i>Iron-deficiency anemia</i>
<i>IE:</i>	<i>Ineffective erythropoiesis</i>
<i>IL:</i>	<i>Interleukin</i>
<i>IQR:</i>	<i>Inter-quartile range</i>
<i>ISTH:</i>	<i>International Society on Thrombosis and Haemostasis</i>
<i>ITP:</i>	<i>Immune thrombocytopenia</i>
<i>KCC:</i>	<i>K-Cl cotransport</i>
<i>Kg:</i>	<i>Kilogram</i>
<i>LCR:</i>	<i>Locus control region</i>
<i>LDH:</i>	<i>Lactate dehydrogenase enzyme</i>
<i>LMP:</i>	<i>Leukocyte microparticles</i>
<i>MCH:</i>	<i>Mean corpuscular Hb</i>

List of Abbreviations (Cont...)

Abb.	Full term
<i>MCV:</i>	<i>Mean corpuscular volume</i>
<i>MelCAM:</i>	<i>Melanoma cell adhesion molecule</i>
<i>mg:</i>	<i>Milligram</i>
<i>miRNA:</i>	<i>Micro RNA</i>
<i>MPN:</i>	<i>Myeloproliferative neoplasms</i>
<i>MPs:</i>	<i>Microparticles</i>
<i>mRNA:</i>	<i>Messenger RNA</i>
<i>MVEs:</i>	<i>Multi-vesicular endosomes</i>
<i>NADPH oxidase:</i>	<i>Nicotinamide adenine dinucleotide phosphate oxidase</i>
<i>NMD:</i>	<i>Nonsense-mediated decay</i>
<i>NO:</i>	<i>Nitric oxide</i>
<i>No.:</i>	<i>Number</i>
<i>NPV:</i>	<i>Negative predictive value</i>
<i>NS:</i>	<i>Non significant</i>
<i>NTA:</i>	<i>Nanoparticle tracking analysis</i>
<i>NTDT:</i>	<i>Non-transfusion dependent thalassaemia</i>
<i>O₂:</i>	<i>Oxygen</i>
<i>ODC:</i>	<i>O₂-Hb dissociation curve</i>
<i>PBS:</i>	<i>Phosphate Buffer Saline</i>
<i>PC:</i>	<i>Phosphatidylcholine</i>
<i>PCO₂:</i>	<i>CO₂ partial pressure</i>
<i>PEA:</i>	<i>Phosphatidylethanolamine</i>
<i>PE:</i>	<i>Phycoerythrin</i>
<i>PECAM:</i>	<i>Platelet endothelial cell adhesion molecule</i>
<i>PF4:</i>	<i>Platelet factor 4</i>
<i>PFP:</i>	<i>Platelet free plasma</i>

List of Abbreviations (Cont...)

Abb.	Full term
<i>pg:</i>	<i>Picogram</i>
<i>pJak2:</i>	<i>Phosphorylated Jak2</i>
<i>PLTs:</i>	<i>Platelets</i>
<i>PMPGA:</i>	<i>PMP generation assay</i>
<i>PMPs:</i>	<i>Platelet MPs</i>
<i>PNH:</i>	<i>Paroxysmal nocturnal hemoglobinuria</i>
<i>PO₂:</i>	<i>O₂ partial pressure</i>
<i>PPP:</i>	<i>Platelet poor plasma</i>
<i>PPV:</i>	<i>Positive predictive value</i>
<i>PS:</i>	<i>Phosphatidylserine</i>
<i>PTC's:</i>	<i>Premature termination codons</i>
<i>QTL:</i>	<i>Quantitative trait loci</i>
<i>RA:</i>	<i>Rheumatoid arthritis</i>
<i>RANTES:</i>	<i>Regulated on activation, normal T cells expressed and secreted</i>
<i>RBC:</i>	<i>Red blood cell</i>
<i>RDW:</i>	<i>Red cell distribution width</i>
<i>RES:</i>	<i>Reticuloendothelial system</i>
<i>ROC:</i>	<i>Receiver operating characteristic curve</i>
<i>ROS:</i>	<i>Reactive oxygen species</i>
<i>RPS:</i>	<i>Resistive pulse sensing</i>
<i>S. ferritin:</i>	<i>Serum ferritin</i>
<i>S:</i>	<i>Significant</i>
<i>SAXS:</i>	<i>Small-angle X-ray scattering</i>
<i>SCA:</i>	<i>Sickle cell anemia</i>
<i>SCD:</i>	<i>Sickle cell disease</i>
<i>SCF:</i>	<i>Stem cell factor</i>