

Recent Advances In Red Blood Cell Substitutes And Its Possible Application In Egyptian Blood Banks

Essay

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ
{قَالُوا سُبْحَانَكَ لَا عِلْمَ لَنَا
إِلَّا مَا عَلَّمْتَنَا إِنَّكَ أَنْتَ
الْعَلِيمُ الْحَكِيمُ}
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LIST OF ABBREVIATIONS

A.ANH	: Augmented – Acute Normovolemic Hemodilution
Ab	: Antibodies
ACD	: Acid citrate dextrose anticoagulant
ACE	: Angiotensin Converting Enzyme
AIDS	: Acquired immuno deficiency syndrome
ALA	: 5 amino levulenic acid
AOCs	: Artificial Oxygen Carriers
ARBCs	: Artificial red blood cells
ARDS	: Acute Respiratory Distress Syndrome
Asn	: Asparagine amino acid
AST	: Aspartate transaminase
ATP	: Adenosine triphosphate
BLA	: Biological License Application
BSE	: Bovine Spongiform Encephalopathy
CAT	: Catalase enzyme
CABG	: Coronary Artery Bypass Graft
CBT	: Cord Blood Transplantation
CD	: Cluster of Differentiation

CFU-E	: Colony Forming Unit - Erythrocyte
cGvHD	: Chronic Graft versus Host Disease
Cl ⁻	: Chloride ions
CMV	: Cytomegalo Virus
CO	: Carbon mono oxide
CO ₂	: Carbon dioxide
CPB	: Cardio pulmonary bypass
CPD-A	: Citrate Phosphate Dextrose- Adenine
CRADA	: Cooperative Research and Development Agreement
Cys	: Cysteine amino acid
DCT	: Double Cord Transplantation
DCL-Hb	: Diaspirin cross-linked Hemoglobin
Deoxy HbA	: Deoxygenated adult hemoglobin
DIC	: Disseminated intravascular coagulopathy
DNA	: deoxy ribonucleic acid
2, 3-DPG	: 2, 3- diphosphoglycerate
EBV	: Epstein Barr Virus
E. coli	: Escherichia coli
ECG	: Electrocardiogram
ELISA	: Enzyme Linked Immunosorbant assay

EPO	: Erythropoietin hormone
ERW	: Emergency Research Waiver
FACT	: Foundation for the Accreditation of cellular Therapy
FDA	: US Food and Drug Administration
Fe ⁺⁴	: Ferryl heme
Fe ⁺³	: Ferric iron
FFP	: Fresh frozen plasma
FiO ₂	: Fractional inspired oxygen
FNHTR	: Febrile non hemolytic transfusion reaction
FTPA	: PerFluorotrypropylamine
Gly	: Glycine amino acid
Glu	: Glutamic amino acid
Gln	: Glutamine amino acid
GVL	: Graft versus Leukemia
H ₂ O ₂	: Hydrogen peroxide
H ₂ CO ₃	: Carbonic acid
HAV	: Hepatitis A Virus
Hb	: Hemoglobin
HbF	: Fetal Hemoglobin
Hb-Fac	: Fetal Hemoglobin-acetylated

HbP	: Hemoglobin Presbyterian
HbA	: Adult Hemoglobin
HbH	: Hemoglobin H disease
HbV	: Hemoglobin Vesicle
HBV	: Hepatitis B Virus
HBsAg	: Hepatitis B surface antigen
HBcAb	: Hepatitis B core antibodies
HBOCs	: Hemoglobin Based Oxygen Carriers
HCO ₃	: Bicarbonate ions
HCV	: Hepatitis C virus
HIV	: Human immune deficiency virus
HLA	: Human Leucocytic Antigen
Hp	: Haptoglobin
HPLC	: High performance liquid Chromatography
HSCs	: Hematopoietic Stem cells
HSA	: Human Serum Albumin
HTLV	: Human T- lymphotropic virus
ICU	: Intensive Care Unit
Ig	: Immune globulin
IL	: Interleukin
IP	: Incubation Period

INF	: Interferon
Leu	: Leucine amino acid
LEH	: Liposome-encapsulated Hemoglobin
Lys	: Lysine amino acid
Mal	: Maleimide
MAP	: Mean Arterial Pressure
MCP-1	: Monocyte-Chemotactic Protein-1
MDS	: Myelodysplastic syndrome
MET-HB	: Met- Hemoglobin
MI	: Myocardial infarction
MOH&P	: Ministry of Health and Population
n	: Hill coefficient
NAT	: Nucleic acid amplification
NADH	: Nicotinamide adenine dinucleotide
NADPH	: Nicotinamide adenine dinucleotide phosphate
NC	: Nucleated cell
NMW	: Nominal molecular weight
NMRC	: Naval Medical Research Center
NO	: Nitric Oxide
NO.HB	: Nitroso- Hemoglobin

NSCLC	: Non small cell lung carcinoma
O ₂	: Oxygen
PCR	: Polymerase Chain Reaction
PCI	: Percutaneous Coronary Intervention
PEG	: Poly ethylene glycol
PEG-Hb	: Ploy ethylene glycol-conjugated hemoglobin
PEI	: Polyethyleneimine
PFCE	: Perflurocarbon Emulsion
PFD	: Perflurodecalin
Phe	: Phenylalanine amino acid
PHP	: Pyridoxylated hemoglobin phosphate
PN-a-a-Hb	: Polynitroxylated alpha-alpha hemoglobin
POE	: Poly Oxoethylene
POLY. HB	: Polymerized Hemoglobin
PRBC	: Packed Red Blood Cell
PTCA	: Percutaneous Coronary Angioplasty
PTP	: Post transfusion purpura
PU	: Polyurea
R state	: Relaxed state of hemoglobin
RBCT	: Red Blood Cell Transfusion
RBCs	: Red Blood Cells

RES	: Reticuloendothelial System
RESUS	: Restore effective SURvival in Shock
RH	: Rhesus factor
rHb1.1	: First Recombinant human Hemoglobin
rHb2.0	: Second Recombinant human Hemoglobin
r.HSA	: recombinant Human Serum Albumin
rHuG-CSF	: recombinant Human Granulocyte – colonyStimulating Factor
RIBA	: Recombinant Immuno Blot Assay
RNA	: Ribonucleic acid
ROS	: Reactive Oxygen Species
RSR	: Allosteric modifier
SAG-M	: Sodium adenine glucose-mannitol additive solution
SCD	: Sickle cell disease
SEM	: Scanning Electron Microscope
SF-Hb	: Stroma Free Hemoglobin
SH	: Sulphhydil group
SOD	: Superoxide –Dismutase enzyme
SYBD	: Synthetic Blood International
T1/2	: Half life
T state	: Tense state of hemoglobin

TA -GvHD	: Transfusion associated graft versus host disease
Tempo	: 2, 2,6,6-tetramethyl-piperidinyloxy
TNC	: Total nucleated cell
Trp	: Tryptophan amino acid
Treg	: T. regulatory cells
TRALI	: Transfusion related acute lung injury
TRIM	: Transfusion related immuno modulation
TTI	: Transfusion transmitted infection
UCBT	: Unrelated Umbilical Cord Blood Transplantation
Val	: Valine amino acid
vCJD	: variant Creutzfeldt Jaccoub Disease
WBCs	: White Blood Cells
ZL-HbBv	: Zero-linked polymers of Bovine hemoglobin

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