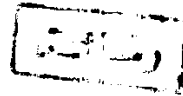


RED BLOOD CELL SUBSTITUTES

ESSAY

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By



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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

<i>Abbreviation</i>	<i>Item</i>
AIDS	Acquired Immune Deficiency Syndrome
AIHA	Autoimmune Hemolytic Anemias
Å	Angstrom
ARDS	Adult Respiratory Distress Syndrome
Arg	Arginine
Asn	Asparagin
ATP	Adenosine Triphosphate
BP	Barometric Pressure
2,3 BPG	2,3 Biphosphoglycerate
CaCO₂	Arterial Carbon Dioxide Tension
CaO₂	Arterial Oxygen Content
CMV	Cytomegalo Virus
CvO₂	Venous Oxygen Content
DBBF	bis-3,5 Dibromosalicyl Fumarate
DHTR	Delayed Hemolytic Transfusion Reaction
DIC	Disseminated Intravascular Coagulation
DMB	Diffuse Microvascular Bleeding
DNA	Deoxyribonucleic Acid
2,3 DPG	2,3 Diphosphoglycerate
FDA	Food and Drug Administration
FIO₂	Fraction Inspired Oxygen
FL-DA	Flusol-DA
GvHD	Graft versus Host Disease
Hb	Hemoglobin
HbA	Adult Hemoglobin
HbF	Fetal Hemoglobin
HBV	Hepatitis B Virus

The development of artificial sources for blood has been a subject of scientific research for many decades. The main advantages being sought are increased safety (no infectious disease transmission), increased availability of the product (no blood shortages or public appeals for donors), stable and high oxygen - carrying capacity, and no need to perform compatibility testing or even ABO / Rh typing prior to transfusion (*Winsa, 1995*).

Work is being done using two different approaches to solve this problem. Hemoglobin solutions and perfluorocarbon emulsions are the two products that have been most extensively evaluated (*Gould et al., 1996*).

The most important functions of a red blood cell substitute are to transport oxygen and carbon dioxide effectively and to support circulatory dynamics (*Gould et al., 1996*).

More recently, recombinant-DNA techniques have enabled the production of human hemoglobin in host expression systems, and progress is being made towards the creation of a genetically engineered molecule incorporating the properties required for a blood substitute (*Ogden, 1992*).

A recombinant - based hemoglobin product that contains all the best features found in these research focus may be the answer at some time in the FUTURE. Clearly the advantages of an artificial product make the search well worthwhile (*Winsa, 1995*).

PHYSIOLOGY OF OXYGEN CARRIAGE

