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## AN ARTIFICIAL BLOOD

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### Abstract

Much water has gone since then and the developing scenario of artificial blood so it could match with the requirements of real blood also improves a lot. The discovery of artificial blood deals with the overcoming from the scenario of bleeding to death due to serious injury. However artificial blood is far from the properties of real blood. This paper describe the formation of an artificial blood to makeover the present requirement of artificial blood in many cases such as big surgeries, serious blood loss injuries etc.; also its production with help of biotechnology. Blood substitutes are underneath development for transfusion in situ of donor blood throughout emergencies and extended surgeries. The primary generation of blood substitutes is presently in clinical trials. Blood transfusions will save the lives of patients WHO have suffered major blood loss, however hospitals don't forever have enough or the proper sort obtainable. In search of an answer, researchers have developed a promising substitute victimization blood's oxygen-carrying element, haemoglobin. Artificial blood is a product created to act as a substitute for red blood cells. Whereas true blood serves many various functions, liquid is intended for the only purpose of transporting element and greenhouse gas throughout the body. Betting on the sort of liquid, it may be created in several ways in which victimization artificial production, chemical isolation, or recombinant organic chemistry technology. Development of the primary blood substitutes dates back to the first 1600s, and also the explore for the perfect blood substitute continues. Varied makers have product in clinical trials; but, no really safe and effective liquid product is presently marketed. It's anticipated that once a synthetic blood product is obtainable, it'll have annual sales of over \$7.6 billion within the U.Salone.

**Index Terms:** Artificial blood, blood, per-fluorocarbon.

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### 1. INTRODUCTION

The objective of concept discussed in this paper is of 'Artificial blood' which works as a substitute of a real blood. Artificial blood formation replicates the properties of a real blood. The concept described in this paper is started from the analysis of state of artificial blood to overcome the requirements of real blood and for also its lack of storage in blood bank. The real blood is the complex fluid and in order to make an artificial blood this complex fluid's complexity should matched up. First of all milk was used as the substitute of the real blood. The Asiatic cholera patients treated with milk and few more patients were treated with the same and the result. The basic requirements of artificial blood are as follows:

- Free Oxygen release and transport capabilities wherever required.
- From pathogens and toxins.
- Provide with strong immune system.
- Capacity of being stored for longer duration
- Most vital safe to use.

Dealing with some of the facts about the blood, it was found that 8 % of human bloods comprise of its body weight blood. In male and female its percentage differs, female acquires around 4-5 litres and male acquires 5-6 litres and this difference occurs due to body size between male and female .its temperature is about 38 degree centigrade and PH level ranges from 7.35-7.45 slightly basic .The viscosity ranges from 4.5-5.5 times viscous as water ,indicating that is more resistant to flow than water .Blood in arteries is brighter red than it's blood in the veins because the higher level of oxygen found in the arteries.

#### 1.1 Composition of blood

Blood is a complex fluid classified as connective tissues consists of two main components.

- Formed elements
- Plasma

## 2. AN ARTIFICIAL BLOOD AND IT'S HISTORY

Artificial blood is nothing but the one of the substitute for the real blood in which red blood cells acts as a substitute

### 2.1 Function

Oxygen and carbon-dioxide carrier

## 3. PRODUCTION AN ARTIFICIAL.

Keeping in mind its types, formation is are as follows:

- Synthetic production
- Chemical isolation
- Recombinant biochemical technology

The formation of artificial blood was introduced in order to replace the function of red blood cells; hence we can say that they are noting but the oxygen carrier rather than the artificial blood.

## 3. HISTORY OF ARTIFICIAL BLOOD.

Bleeding to the death was one of the reasons for the artificial blood. Numerous substance where used as blood substitute such as beer, urine, milk, plants, resins and sheep blood. All these substitute where considered as real blood replacement, but after its replacement it was found that the transfusion results into death. Due to the failure of above substitute it gave rise to the Ringer's solution. Physiologist Sydney Ringer in 1882 gave a saline solution. This solution consists of sodium, potassium and calcium salts. This solution prolonged the life in the body. The solution was practised on the heart of frog, in which it was found that the blood pressure which was lost due to the decrease in volume of blood it was restore by the Ringer's solution. On the other hand it was found that it does not play the role of red blood cell rather than only volume expander and hence it is no more considered as real blood substitute.

## 4. PRESENT SCENARIO IN DISCOVRIES OF ARTIFICIAL BLOOD

Looking after the present scenario of artificial blood it was found that, there are to significantly different products that are under development as blood substitutes. These substitutes differ the way they carry oxygen one is base of PFCs, while other is a haemoglobinbase product.

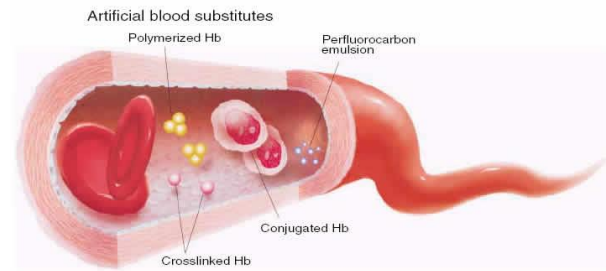


Fig-1: Composition of artificial blood

### 4.1 Per-fluorocarbon (PFCs): The second class substitute.

PFCs are fluorocarbons are straight chain molecules that consist of carbon and fluorine. They are known for their capacity to carry both oxygen and carbon-dioxide without actually binding to the gas molecules. Molecules of a "new per-fluorocarbon" allow the blood substitute to contain a higher concentration of PFCs, which subsequently increases the oxygen carrying capacity of the artificial blood.

### 4.2. Hurdles to overcome before PFCs use.

- The oxygen carrying capacity of PFCs is not better than HBOs.
- Its removal leads to engulfing.
- It is not soluble in water.

## 5. HEMOGLOBIN SYNTHESIS USING BIOTECHNOLOGY

In order to obtain the haemoglobin by using biotechnology, the bacteria named E-coli has been used. E-coli have ability to produce human blood. Flowing is the Steeps involve in synthesis of haemoglobin using E-coli Bacteria.

- Firstly the sample of pure bacteria is been cultured and transfer to test tube that contain all nutrients necessary for growth. This initially inoculation causes the bacteria to multiply when the population is greater enough they are transferred to seed tank.
- Seed tank provide an ideal environment for growing bacteria and for production of hemoglobin. Then the contents of seed tank are pumped to the fermentation tank.

After the production of hemoglobin in fermentation tank isolation is done with centrifugal separator and it is then transfer to final processing where it is pasteurized and put it into appropriate packaging.

## 6. CONCLUSIONS

A Novel approach to the discovery of an artificial blood can be called as discovery of blood substitute.

Currently the ideal blood has not yet been developed or marketed. In quest of finding the perfect blood substitute, human innovation and collaboration will address the impending blood shortage.

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