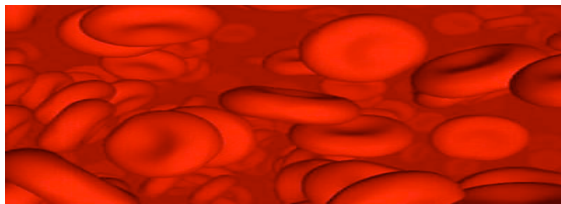


Synthetic Blood

Prepared by: Weston Cook
Prepared for: University of Rhode Island
Biomedical Engineering Department

“Doctor and scientists have come up with lots of gadgets that can take over for parts of the body that break or wear out. A heart, for example, is basically a pump; an artificial heart is a mechanical pump that moves blood. Similarly, total knee replacements substitute metal and plastic for bones and cartilage. Prosthetic limbs have become increasingly complex, but they’re still essentially mechanical devices that can do the work of arms or legs. All of these are fairly easy to comprehend – swapping out an organ for a manmade replacement.” However, the understanding of synthetic blood is not quite as simple. Blood has many parts, such as plasma, RBC, and WBC, and has many tasks, such as oxygen delivery, carbon dioxide removal, fight illness, etc. At this point in time, there is not one manmade substance that can imitate this action. Synthetic blood however does mimic the most important task, oxygen delivery.

There currently are two types of synthetic blood, hemoglobin-based oxygen carriers (HBOCs) and perfluorocarbons (PFCs). Major differences in these two types are the size and how they are made. HBOCs are the smaller of the two at a size ranging from 0.08 to 0.1 microns and PFCs are 0.2 microns. HBOCs are made from RBCs from expired humans, RBCs from cow blood, genetically modified bacteria, and human placentas; where PFCs are made of entirely synthetic material.



The reasons that society needs synthetic blood is that it can be made and stored more readily

than actual blood. Synthetic blood has a shelf life of over a year and can be used at all temperatures and environments. Where actual blood has a shelf life of forty-two days and must remain at a constant temperature of forty degrees. Synthetic blood is much smaller than RBCs so it is able to get into cancerous and swollen tissues allowing more options for treatment to prolong lives.

With all improvements that show positives there are always negatives too. A few controversies brought upon by synthetic blood are the ability for a person who before couldn’t get transfusions because of religious beliefs is now able to because of the PFCs completely synthetic make up. Another controversy had to do with the FDA allowing no consent human trials because the patient was unconscious. A situation came up when there was no data showing that the synthetic blood was doing better in testing than the actual blood transfusions.

“In spite of the controversy, synthetic blood may be in widespread use within the next several years.”

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