

Comments on Dr. Estep's "letter to the editor":

Dr. Estep has made an important point in "What is in a name?". In clinical medicine any "cure all" therapy is immediately suspected. This is even more so in the area of "blood substitutes". It is good to see that the original "oxygen carrier" has since evolved into different types of "oxygen therapeutics". Examples include oxygen carriers with oncoctic properties, oxygen carriers with antioxidant properties, oxygen carrier that modulates nitric oxide, oxygen carriers with tyrosinase for melanoma, oxygen carrier with combined platelet-like activity and others. More recently, there is the development of a therapeutic antioxidant that can also transport both oxygen and carbon dioxide. Complete nano dimension artificial red blood cells that approach the complete function of red blood cells are also in the final stages of development. It is important for clinical use to have a variety of approaches each suitable for specific therapy. On the other hand, there is no need to use a complicated and expensive system if simpler ones are just as safe and effective for some specific clinical uses.

Is there a danger for potential polarization when using the term "blood substitutes"? The Canadian Red Cross Society gave full financial support for a number of "International Symposia in Blood Substitutes" that I have organized in Canada. They also gave much research support for our research on "blood substitutes". The Chinese Red Cross Society has also given much support to one of the International Congresses on Artificial Cells and Blood Substitutes in Beijing. The Japanese Red Cross Society also collaborates actively with blood substitute researchers in Japan. I have no personal experience with other countries, but if in another country there is polarization, is it because of the name "blood substitute" or is it because of how the end product is perceived? Would it be resolved by defining more specific areas of application and more specific names for commercial products?

Commercial products are products which have reached a stage for development towards possible clinical uses. In these cases, it is important to give specific names and uses for the specific products. Many of the commercial products already have very specific description of polyhemoglobin, conjugated hemoglobin, recombinant haemoglobin etc. It would be even better if these are associated with more specific areas of applications. On the other hand, basic researchers are usually working towards "long term goals" or "dreams". They tend to "dream" of a complete "blood substitute" to eventually replace whole blood. For them, "blood substitutes" is not a product, but a goal that they strive to reach. By having this type of "dreams", they have contributed much to the progress in this area, including contribution to the developments of new therapeutic agents. In order to cover the interests of both groups and to allow for the much needed interactions, a number of recent international symposia in this area have used the name "Blood Substitutes and Oxygen Therapeutics". Many years ago, the original idea of an artificial red blood cell has even evolved into "artificial cells". Artificial cells now has applications in nanomedicine, many types of delivery systems for drugs, genes, cells and stem cells, and even in nanocomputer, agriculture, biotechnology, chemical engineering and many other areas. Thus, let's keep up with the "long term goals" and "dreams" and at the same time be more specific with the names and uses of specific end products.

You are invited to express your view regarding this important topic in the form of further "letters to the editor".

Professor Thomas Ming Swi Chang, OC,
MD, CM, PhD, FRCPC, FRS(C)
Editor in Chief, JABB