

MEET HERB CULLIS, INVENTOR OF THE APHERESIS MACHINE

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When Herb Cullis began his studies at the University of Maryland he knew he wanted to be a medical technologist and work to help people. But what he didn't know was that he would soon change the world of blood donation and transplantation.

Prior to the 1960s, blood was collected and then mechanically separated into various blood components to treat specific clinical conditions. Platelets are one of the key components of blood necessary for clotting. While whole blood donations are undoubtedly lifesaving to those in need of blood transfusions, it would take six whole blood donations to provide the amount of platelets needed to help in the blood clotting process.

The American Instrument Company hired Cullis in 1965 to build medical equipment. His first assignment was to build a machine that draws blood directly from donors, separates the platelets from whole blood and then returns the remaining blood components to the donor. This machine would then enable donors to come back and donate platelets every two weeks instead of every 56 days with whole blood donation.



Cullis explaining the freezing process of cells at the AFC facility.

The importance of platelets is the clotting factor- when blood vessels are damaged, platelets collect at the site to form a 'plug' to prevent or stop bleeding. "There is always a need for platelets, there never seems to be enough" adds Cullis to underline the urgency of platelet donation. The largest single users of platelets are individuals receiving transplants, followed by high risk surgery patients (i.e. heart patients) and patients during child birth.

Four years later, Cullis and seven team members built the first blood cell separator, Fenwal CS3000™, in 1972. Cullis' work on medical equipment helped coin the term 'apheresis', instead of the more cumbersome term 'blood separation equipment'. Apheresis went into clinical usage as a term in 1979.

Since its invention, the Fenwal CS3000™ has been distributed worldwide with an estimated count of 3,500 machines in active use. The prototype has been on display at the Smithsonian Institution in Washington, D.C. since 2002 and is claimed to be the only invention on display while still in production.

Over 40 patents later, Cullis still considers the apheresis machine to be his most important invention. “Blood donors are heroes, platelet donors are super heroes” claims Cullis as he talks about the importance of platelet donation.



Cullis demonstrating the blood separation feature of an early apheresis machine model

A proud recipient of the Dale Smith award from the American Association for Blood Bankers for developing apheresis equipment, Cullis is anything but finished with his work. He currently serves as the president of American Fluoroseal Corporation (AFC) where he is manufacturing over 300 types of bags used in medical research for transplantation and the study of genes.

Given all of Cullis' work and awards, he knows the importance of blood donation and would encourage all to donate today! Become one of Herb Cullis' heroes and donate whole blood or platelets. Visit the Armed Services Blood Program website: www.militaryblood.dod.mil and click on the *Give Blood Now!* button to schedule a donation appointment online!