

## Fact Sheet: Blood Plasma

### The Composition of Blood

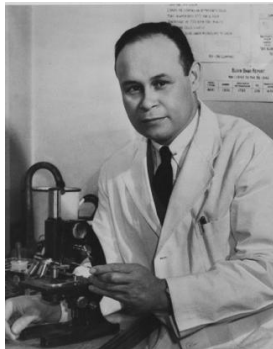
Blood is a mixture, made up of four components: red blood cells that carry oxygen to the body, white blood cells that defend the body against disease, platelets that assist in the clotting of wounds and plasma. Blood plasma is a clear, sticky liquid composed mainly of water. It carries nutrients to the cells of the entire human body. Replenished by the body every four months red blood cells are covered with antigens, markers that determine blood type. Humans have two possible antigens, A and B, which in different combinations determined by inheritance, make up the four human blood types, A, B, AB, and O. If certain blood types mix when a person receives a blood transfusion, life-threatening complications might occur. Type O carries no antigens and is considered the universal donor because any person can receive a transfusion of type O blood safely.

### Blood Transfusion on the Battlefield

During WWII the use of blood plasma was an essential component of treating wounded soldiers. When a soldier is critically wounded, blood loss is extremely dangerous. Rather than the loss of oxygen carrying red blood cells, the greatest concern is the loss of fluids which results in low blood pressure. By transfusing casualties with plasma, blood volume is maintained and blood pressure remains at a normal level, preventing shock. Because the red blood cells are removed from plasma, the need to match the blood type of the donor to the recipient is unnecessary. In addition, dried plasma can be stored for long periods of time without refrigeration and transported across great distances. Medics on the battlefield simply reconstituted the dried plasma by adding water before transfusion.



### Dr. Charles Drew



Dr. Charles R. Drew, surgeon and researcher, developed techniques for preserving plasma, the liquid portion of blood. The first African American to receive a Doctor of Science degree, Drew proved that plasma could be stored significantly longer than whole blood. He supervised the “Blood for Britain” program which met the desperate need for blood to treat those wounded during the Blitz. To encourage donation Drew first devised the use of bloodmobiles, trucks with refrigerators serving as donation centers.

On the heels of his successful “Blood for Britain” campaign, Drew was asked to direct New York’s American Red Cross blood bank, tasked with the massive blood drive for the U.S. military. Outraged by the policy to separate donated blood according to the race of the donor, a practice he denounced as unfounded by science, Drew resigned from the project. Howard University appointed him professor of surgery and in 1943 he was asked to serve on the American Board of Surgery, the first African American to do so. Drew died tragically in an automobile accident while traveling to the annual free clinic in Tuskegee, Alabama. Despite his untimely death at only 45 years of age, Dr. Charles Drew is credited as a pioneer in the field of blood transfusion, developing techniques that have saved many lives around the world.