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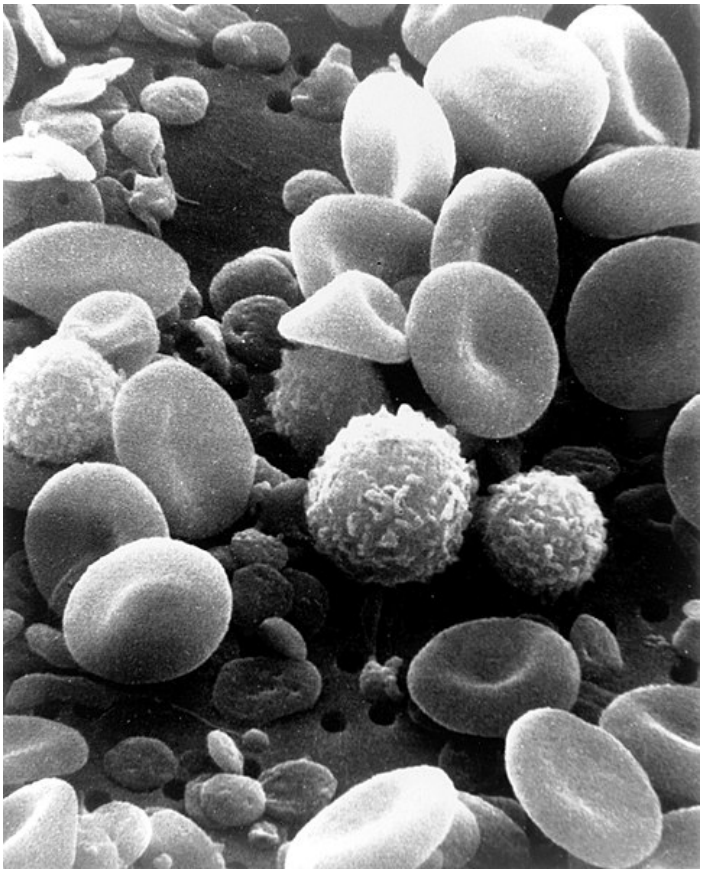
INTRODUCTION TO BLOOD, STRUCTURE AND FUNCTION AND BREAKDOWN



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Upon first glance, following a cut or injury, blood may appear to be an elementary, red fluid. However, further examination reveals that blood is composed of many different components. Blood can be broken down into a liquid portion containing many types of dissolved substances and a cellular portion containing human cells and cell fragments. The liquid portion is known as **plasma.** The cellular portion is referred to as **formed elements.**

For thousands of years, humans were mystified by the true nature of blood. History records that early scientists noticed blood in early egg embryos. They correctly assumed that blood was created early to nourish the developing body. They also noticed that when blood left the body, so did life. Some in ancient times thought that such an important thing as blood might be the very soul of man. Perhaps this was why the barbaric practice of "bloodletting" came into practice. If a person's blood was bad, let some out and they should begin to feel less tortured. Perhaps they could be cured of all

types of ailments by losing a little bit of blood. So popular was the idea of taking blood out that the practice of bloodletting didn't end until the end of the 19th century.

Blood is actually a type of connective tissue that has a liquid matrix rather than a solid matrix like the other connective tissues. In order to gain a basic appreciation of blood, one simply needs to consider the basic requirements of each of the trillions of cells in the human body. Each cell requires oxygen, nutrients, water, and waste disposal in order to survive. In early eukaryotic organisms, this task was simple. Many of these organisms lived in aquatic environments and their structures were such that all of their cells were in direct contact with water. Nutrients and waste were passed to and from the cell by simple diffusion with the environment. The human body is far more complex and it is impossible for our cells to fulfill their basic needs through passive diffusion alone. Thus, our very existence relies upon our circulatory system which is responsible for moving blood around our bodies. It would be hard to overstate how complex this network of "plumbing" is. Though very hard to measure, it is believed that if all the blood vessels in your body were laid out end to end, the final length would be enough to go around the world at least a couple of times.