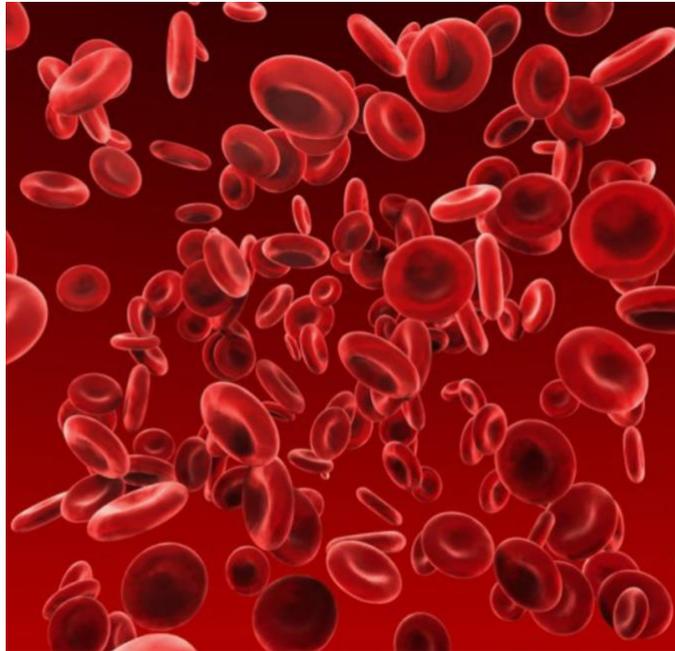
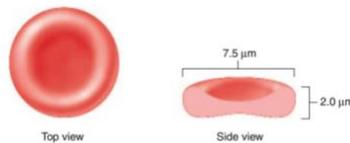


# rbc

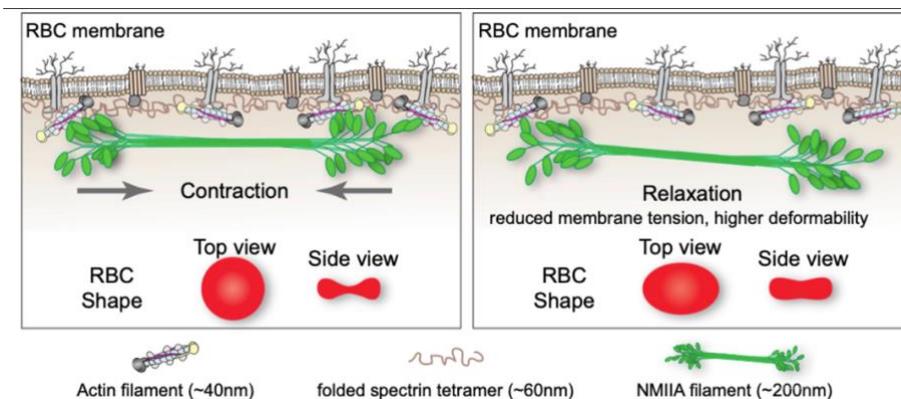


Red blood cell - **rbc** - is shorthand for the circulating **erythrocyte**  
... from Greek: **έρυθρός κύτος** : **red cell**.

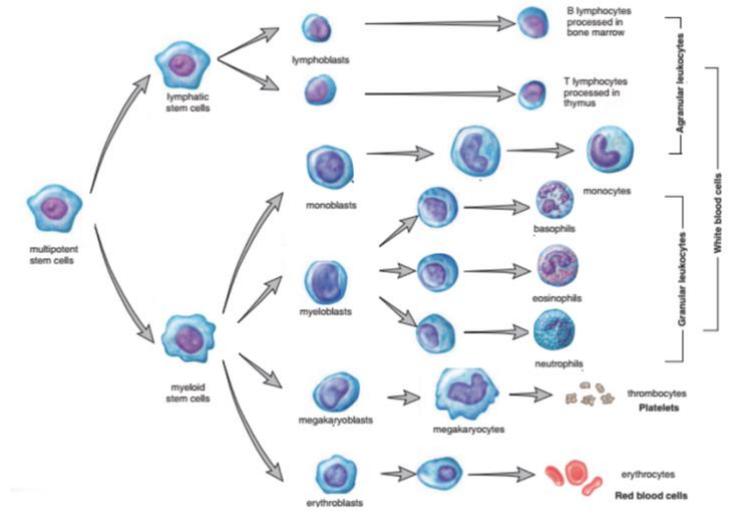
The adult human body is composed of 30,000,000,000,000 (30 trillion) cells; 75% of these are **rbcs**. Small and flexible, rbc's are swept along in the pulsing flow of plasma which is pumped from the heart, moving through arteries and arterioles, quickly deforming their membranes to squeeze through capillary channels, then on into the venous circulation. Each rbc makes a full circuit of the body (pulmonary and systemic circulations) in about 1 minute.



Plentiful and brightly colored, they are hard to miss, but with their "simple" structure, erythrocytes (rbcs) are often relegated to a quick description when their physiology is reviewed: "*a cell without a nucleus, a membrane sack loaded with hemoglobin, carrying oxygen from lungs to tissues*". The topic of discussion then switches to the important functional dynamics of hemoglobin, and the cell itself moves out of the limelight.



Each rbc has a beginning and a limited lifespan. Every second, 2 million new rbcs move from the marrow of bone, where they form from stem cells, and into the circulation. After 4 months of service, certain features on the outer membrane of an aging rbc are detected as faulty by patrolling macrophages (wbcs) and the rbc is eliminated. Rates of production and destruction are matched, so the overall concentration of rbcs in blood (red cells + plasma) is maintained at a near-constant 40%.



Erythrocytes begin like all other living cells, arising from a pre-existing cell (*Omnis cellula e cellula*, as Virchow stated.). As it leaves its place of origin in the marrow, however, its nucleus is extruded and left behind. Later, mitochondria and other organelles are eliminated, and the mature erythrocyte assumes its characteristic shape of a biconcave disc. The red color comes from the 250,000,000 molecules of hemoglobin contained in each rbc. When fully bound with oxygen as blood returns to the left atrium from the pulmonary circulation, hemoglobin is bright red. When blood is delivered to cardiac muscle (via coronary arteries) and to peripheral tissues (via systemic arteries), oxygen detaches as rbcs pass through the capillary network. Deoxygenated hemoglobin imparts a dark red color to rbcs as they return to the right atrium in the venous flow.

