The world of small suspended objects

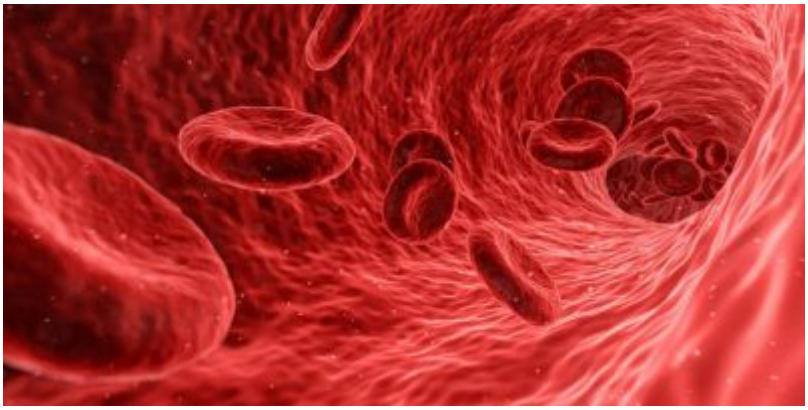

Figure 1. Red blood cells, or erythrocytes, suspended in blood plasma represent about half of the blood volume. The diameter of a cell is about 8 microns (0.008 mm)

In our environment, there are many examples of small objects suspended in a fluid, other than fog droplets. This is the case with the **red** blood **cells** in our blood that take oxygen from our lungs and carry it to our muscles and organs. This is also the case for **fat** droplets **in milk**, which settle very slowly to form a superficial skin (cream). In a powdery snow avalanche, **snow crystals** are also suspended in the carried air, which is a fluid denser than ambient air, which can flow down slopes at considerable speeds (see article Snow Avalanches). Similarly, water loaded with **clay or silt particles** extracted by riverbed erosion becomes cloudy. These particles settle very slowly and the deepest layers, where the fluid is most dense, sometimes flow as **turbidity currents** to the bottom of lakes and oceans.

Why don't the clouds in the sky fall? This example raises questions about the stability of suspensions. The amount of liquid water in a cloud is about 1 g per m^3. Although this represents only 1/1000 of the air mass, it would in itself be sufficient to cause the clouds to fall heavily. But clouds also contain **water vapour**, which is warmer and lighter than dry air, and in greater quantity than liquid water. In addition, clouds are generally formed by natural **convection** in columns of air that are warmer than their environment. A heating of 1°C is sufficient to create a 0.3% decrease in density, thus largely compensating for the weight of the water drops. For the same reason, fumes tend to rise despite their charge of droplets or solid ash.