Methemoglobin

Methemoglobin (English: methaemoglobin) (pronounced “met-hemoglobin”) is a form of the oxygen-carrying metalloprotein hemoglobin, in which the iron in the heme group is in the Fe3+ (ferric) state, not the Fe2+ (ferrous) of normal hemoglobin. Methemoglobin cannot bind oxygen, unlike oxyhemoglobin.

It is bluish chocolate-brown in color. In human blood a trace amount of methemoglobin is normally produced spontaneously, but when present in excess the blood becomes abnormally dark bluish brown. The NADH-dependent enzyme methemoglobin reductase (diaphorase I) is responsible for converting methemoglobin back to hemoglobin.

Normally one to two percent of a person's hemoglobin is methemoglobin; a higher percentage than this can be genetic or caused by exposure to various chemicals and depending on the level can cause health problems known as methemoglobinemia. A higher level of methemoglobin will tend to cause a pulse oximeter to read closer to 85% regardless of the true level of oxygen saturation.

Blood goes through sequential stages of degradation from oxyhemoglobin to deoxyhemoglobin, methemoglobin, and then hemosiderin.