Sickle cell anemia is a genetic disease that affects hemoglobin, the oxygen transport molecule in the blood. The disease gets its name from the shape of the red blood cells under certain conditions. Some red blood cells become sickle shaped and these elongated cells get stuck in small blood vessels so that parts of the body don't get the oxygen they need. Sickle cell anemia is caused by a single code letter change in the DNA. This in turn alters one of the amino acids in the hemoglobin protein. Valine sits in the position where glutamic acid should be. The valine makes the hemoglobin molecule stick together forming long fibers that distort the shape of the red blood cells and this brings on an attack.