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Carolina Perez Biology 3 — Introduction to Biology Los Angeles Southwest College Spring 2013 Instructor: Robert L. Stewart, Jr. Sickle cell anemia affects people with African, Mediterranean, Middle Eastern, and Indian ancestry (Scientific American). Sickle cell anemia occurs when a person inherits two sickle cell gene, one from each parent, that cause the red blood cells to change and become crescent shaped. The underlying problem involves hemoglobin, a component of the red blood cells. Hemoglobin is a protein molecule in red blood cells that carries oxygen from the lungs to the body's tissues and returns carbon dioxide from the tissues to the lung. In sickle cell anemia, the hemoglobin is flawed (The New York Times). As a result, the cells become sickle shaped and can't travel as easily through blood vessels. Sickle cell anemia is an illness, which has one primary cause, but a variety of symptoms and treatments (Scientific American.) Like some illnesses, sickle cell anemia has one primary cause. In order for sickle cell anemia to occur is when a sickle cell gene have, been inherited from both the mother and the father, so that the child has two sickle cell gene. The sickle cell gene causes the body to make abnormal hemoglobin. As mentioned above, hemoglobin is a protein molecule in red blood cells that carries oxygen from the lungs to the body's tissues and returns carbon dioxide from the tissues to the lungs. A person with normal red blood cell will have hemoglobin A; however, a person with sickle cell disease will have hemoglobin S (Journal of America Medical Association) Normal red blood cells are usually round and soft and travel easily through small vessels; however, sickle cells are abnormally shaped and stiff, thus causing them to have difficulty travelling through small vessels. Sickle cells can clog vessels

depriving tissues of oxygen. As spoken of in two articles (US News and World Report). Sickle cells have a shorter life span than normal red blood cells. Sickle cell anemia does not only have one primary cause, but also has a variety of symptoms. Sickle cell anemia has various symptoms that may vary upon every human. All the symptoms that a person may experience are basically the direct result of the abnormal shaped blood cells. These cells deprive tissues of oxygen and in time the lack of oxygen to the tissues damages the organs and leads to pain. The intensity and duration of pain will depend on the activity of organs involved. (Scientific American) As shown in the articles learn genetics (many organs such as the spleen, liver, kidneys, lungs, heart and so on can be damage by the lack of oxygen. Many articles state that the most common symptoms an individual can suffer from are fatigue and anemia, pain crises, bacterial infections, episodic pain in chest, abdomen and joints, poor eyesight, strokes and many more. If any human experiences fatigue this is mainly is because there are dead sickle cells. The bone marrow has to work harder in producing red blood cells to replace the dead ones and this causes the body to use more energy. Besides experiencing fatigue, an individual can experiences various painful episodes. Pain is cause by the lack of oxygen to the organs and the sickle cells that eventually block blood vessels due to their rigid and sickle shape. Infection is also another example of an individual's symptoms. Because of the many organs that help the immune system fight infections such as the over the counter pian releve do too little to the affect the spleen, this results in a poor immune system and an individual may have many infections (science). In addition, sickle cell anemia does not only have one primary cause, a variety

of symptoms, but also a series of treatments. Two articles () suggest there is no widely available cure for sickle cell anemia, yet, there are a variety of treatments that can help reduce the pain and symptoms. Treatments may vary from individual's need. When only mild pain is suffered by the individual, they are usually offered over the counter pain medication. Other than medication, they are told to have a lot of rest and to drink plenty of fluids. If the pain starts mild and gradually gets worse they are given acetaminophen or non-steroidal anti-inflammatory drugs. Severe pain obviously occurs in individuals who are given Hydroxyurea. Hydroxyurea will decrease the pain and prevent crises. Other treatments could include blood transfusion and surgery. Sickle-cell anemia may, soon be treated by a normal gene within the womb of the mother. The new science report have just discovered that the molecular switch for activating the fetal form of hemoglobin of the iron containing protein in red blood cells that transports oxygen which could help alleviate the symptoms of genetic blood disorders, including sickle-cell anemia. Sickle cell anemia is an illness caused by the inheritance of the hemoglobin S, an abnormal type of hemoglobin (Scientific America). Not only is sickle cell anemia cause by an abnormal hemoglobin but pain occurring when body tissues are damaged by lack of oxygen. Serious and even life-threatening complications can result from severe or prolonged oxygen deprivation. Symptoms, which vary from patient to patient may trigger frequent and very painful sickle cell crises in some people, however in others, it may cause less frequent and milder attacks. To this date, there is a diverse amount of treatments that may help with sickle cell

anemia, but researchers are studying for additional treatments that may be better.