

Some traits are not all genetic!

- Environmental influence
 - Factors that stem from the environment that can affect gene expression (i.e. phenotype)
 - Exposure to UV radiation
 - Drugs
 - Chemicals
 - Nutrition deficiencies
 - Temperature
 - Light
- Example traits that can be affected
 - Height
 - Some types of cancer (lung, skin)

Environmental Factors: Cause and Effect

- Lung/mouth cancer – tobacco use
- Skin cancer – vitamin D, folic acid and sun exposure
- PKU- diet
- Heart disease – diet/exercise

Sickle Cell Anemia

- Recessive disease that causes blood cells to be misshapen



Normal Red Blood Cell



Sickle Cell

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Sickle Cell Anemia

- Sickle Cell Anemia affects approximately 100,000 Americans
- Sickle Cell Anemia occurs in about 1 out of every 365 African or African-American births.

WHY???

Sickle Cell Anemia

- Possible genotypes – remember it's recessive

AA – normal, no sickle cell disorder

Aa – heterozygous, carrier, but no sickle cell disorder

aa – have sickle cell disorder

1 in 13 Africans or African-Americans have the sickle cell trait (the a)

WHY???

Being a carrier for Sickle Cell
protects against Malaria!!!

Phenylketonuria (PKU)

- Defective protein = can't convert phenylalanine to tyrosine
 - Excess phenylalanine is TOXIC
- Treated with DIET – control intake of phenylalanine
 - Diet soda
 - Soy
 - Cheese/Dairy
 - Meat
 - Beans