Introduction

Bone mineral density (BMD) is the result of a complex interaction between genetic and environmental factors. As a metric, it can be used to identify osteoporosis, determine the risk of fracture, and measure responses to treatments that affect bone remodeling. Previous research has shown BMD to be highly heritable with genetic factors accounting for approximately 50% to 85% of BMD (O'Phelan, 2012). Other anthropometric traits have similar genetic components.

Thorleifsson et al. (2009) have also discovered an association between the genes affecting bone and limb development. They found that a SNP in the CLDN14 gene was associated with bone and limb development.

Experimental Design and Methods

Cohorts

The FAMuSS cohort consists of 150 African American male and female participants who were enrolled at Children's National Health System as part of a fracture analysis study examining dietary intake of calcium and vitamin D and collecting various measurements of bone mineral density and obesity. The cohort consists of 79 participants with a forearm fracture and 75 without any history of fracture ranging from five to nine years of age. Maximus GmbH (2008) generated genotype data.