The Viking Genetic Legacy
The Diaspora of Alpha-1

The Diaspora of Alpha-1, or the scattering of the Alpha-1 (α₁-antitrypsin) mutated gene, was first described by the World Health Organization in 1996, and confirmed in *Respiratory Medicine* by D.C.S. Hutchinson in 1998. The *National Geographic*’s Viking expert, Patricia Kellogg, used these as sources in publishing Bettina Irvine’s letter, "The Viking Genetic Legacy," in 2000:

“The Vikings left a genetic legacy. Alpha 1-antitrypsin deficiency is an often fatal disease that can affect the lungs and liver. A severe form is caused by a genetic variant that originated in Scandinavia and spread during the Viking exploration throughout northern and eastern Europe. Today this legacy, widely underdiagnosed, affects perhaps as many Americans as cystic fibrosis.” Fred de Serres’ insightful paper, which was published by *Chest* in 2002, builds on and adds breadth to this body of research. He concludes that Alpha-1 “may be one of the most common serious hereditary disorders in the world.” He supports the proposition that the spread Alpha-1 may be attributed in part to the voyages of the Viking to colonize and then to assimilate into England, Ireland, Scotland and France in 9th century Europe as well as the Flemish and Germanic states bordering on the North Sea.

Dr. David Lomas of Cambridge University in his paper, “The Selective Advantage of Alpha-1” published by *American Journal of Respiratory and Critical Care Medicine* in 2006, comments that Alpha-1 “is believed to have arisen from a single origin 66 generations or 2,000 years ago after the divergence of the races. The high frequency in southern Scandinavia suggests that the mutation arose in the Viking population. The date of origin implies that the [mutated gene] arose when the Vikings populated mid- or northern Europe and before their migration to Scandinavia. It is likely that [Alpha-1] was then distributed across northern Europe by the Viking raiders between 800 and 1,100 A.D”. Nicholas Wade of the *New York Times* who is a leading writer on “gene flow”, the use of genetic markers to track population movements,
has “thanked us for the information about Alpha-1 and the Vikings”. The Viking chronologist, Dr John Haywood, said this “could very well be a genetic legacy of the extensive Scandinavian settlements in Britain” (such as York and Dublin). Thor Heyerdahl, the Norwegian explorer, wrote that the Diaspora of Alpha-1 “argument seems to be important”. The burning question is the driving force behind the scattering of Alpha-1. An article in the American Museum of Natural History Magazine proposed that there are high-risk mutated genes that can protect against infectious diseases. The single gene that causes cystic fibrosis if one has two copies is an adaptive defense against Salmonella, the bacterium that causes typhoid fever, and the single gene that causes sickle cell anemia protects against malaria. The AMNH article speculated that Alpha-1 improved access to the cells of the immune system. They said it was too common to be a result of a random mutation and too wide spread geographically to be a result of a founder effect.

Dr. Lomas suggests that the Alpha mutated gene confers a selective advantage. “Over the centuries of evolution and in the pre-antibiotic era, the largest threat to man has been infectious disease; pneumonia, tuberculosis, influenza, and gastroenteritis accounted for 40% of all deaths in the United States in 1900. Thus, more inflammation would lead to a more rapid clearance of infection and a higher chance of recovery….Thus, the pro-inflammatory response of [Alpha-1] was likely to be hugely advantageous to a population living with malnutrition, poor housing, overcrowding, poor sanitation, and the high risk of infectious disease that for many characterized the pre-antibiotic era.”

One can only speculate that the Viking explorers may have been successful in their conquests, not only because of their fierce valor, but equally important, benefitting from Alpha-1, these explorers may have remained disease-free while others suffered from the scourges of the times.