

**Thème 1 - La Terre dans l'Univers, la vie, l'évolution du vivant**  
**1-A – Le brassage génétique et sa contribution à la diversité génétique.**

**Amish community: rare genetic mutation protects against ageing**

**Question - With the help of the documents and your scientific knowledge, explain how this situation is a special case of genetic drift<sup>1</sup>.**

**Document 1 - Amish<sup>2</sup> hold secret for longer life after MUTANT gene discovered by scientists.**

**SCIENTISTS have discovered that certain members of the Amish community have an age-defying mutant gene which allows them to live 10 years longer than the average person.**

5 Researchers decided to investigate the Amish community as they live to a “remarkable” average age of 85 without the help of the outside world, such as modern medicines and technology.

The research was carried out with the Old Order Amish of Indiana. The scientists found certain individuals, who carry a single non-functional copy of the gene SERPINE1, can live for an average of 10 years longer than other people in their community.

10 Dr Douglas Vaughan, a cardiovascular specialist at Northwestern University who co-authored the study published in Science Advances, said: “They don’t take advantage of modern medicine in general, so the fact that the carriers have a median lifespan of nearly 85 is rather remarkable.” The mutation gives the individual longer telomeres – which are the caps that sit at the end of chromosomes and protect them from the wear and tear of ageing. Dr Vaughan said that in the outside world, such as the one we live in, the chance of mutation occurs at a rate of one in 70,000, which is why the scientists were astonished to discover that the rate was little more than one in four in the Amish community.

*By Sean Martin, Wed, Nov 15, 2017, <https://www.express.co.uk>*

**Document 2: An isolated population offers a rare opportunity**



The Amish community in Berne, Indiana have been genetically and culturally isolated and most are at least distantly related. The ancestors of the Indiana Amish emigrated in the middle of the 19th century from Berne, Switzerland.

The mutation was introduced into the Amish community by farmers from Switzerland, who moved into the area. Two of their descendants, who carried the mutation, married into the Amish community. The Amish community outside the Berne area does not carry this mutation.

30 "This is the only population on the planet that has this mutation," Vaughan said. "It's a 'private mutation.'" People with the mutation live to be 85 on average, significantly longer than their predicted average lifespan of 71 for Amish in general which hasn't changed much over the last century.

*November 15, 2017 | By Marla Paul, <https://news.northwestern.edu>*

1. The Founder Effect is defined as a type of **genetic drift** describing the loss of the allelic variation that accompanies the founding of a new population by a very small number of individuals (a small sample of a much larger source population). From <http://wallace.genetics.uga.edu>

2. The Amish are a group of extremely traditional Christian church fellows who cut themselves off from the modern world.