

Is the Sickle Cell Gene Defect more biologically advantageous than harmful?



EXTENDED PROJECT QUALIFICATION ALICE - UPPER SIXTH

I have always had an interest in human biology - this project stemmed from that, and combined my fascination for both genetic and infectious disease, as it aimed to determine to what extent this gene mutation (arising in Sub-Saharan Africa) could be perceived as advantageous in protecting against malaria, as opposed to being disadvantageous due to the nature of developing the harmful sickle cell disease.

I had expected to find it more biologically advantageous at first, indicated by its continued presence in the gene pool and, therefore, the fact that it was naturally selected in the past. However, when taking into account new treatments being developed for malaria (thus the dwindling importance of the gene defect's protective effect against it) and the lack of a cure or even safe treatment for sickle cell disease, I came to the conclusion that in modern times this gene defect was more biologically harmful than advantageous.

I was glad I picked this topic, as it was something I knew little about, but it had caught my attention when my biology teacher briefly mentioned sickle cell disease at GCSE. The content was complicated, and much of the mechanics of the disease itself and its protective effect against malaria just theories, but it gave me my first insight into research and medical engineering and I couldn't imagine a more interesting topic to have learned about.

I chose to do an EPQ on top of my studies because I have always enjoyed self-directed learning and I wanted a chance to really delve into something I had an interest in. I think in science, learning set content on a syllabus, though of course is important, isn't so much as essential as pursuing answers and information driven by your own curiosity. In my opinion, everyone wanting to go into a scientific career should have the chance to do this, and I am so glad that I did.

When I leave school at the end of next term, I plan to take a gap year where I will hopefully do a ski season working as a chalet host and gain some experience as a healthcare assistant while in the UK. In 2022, I will begin my medical degree at Bristol University, and will see where that takes me from there!