2. A Scientific Field That Deserves More Funding
Select a scientific field you believe should receive greater funding. Briefly describe the field and explain why increased investment would benefit science or society.

Recently, I watched a short-form video on a new scientific study on bowhead whales. The video began by introducing Peto's Paradox, named after statistician Richard Peto, that highlights the surprising observation that the size of an animal does not necessarily correlate with its chances of getting cancer (Caulin and Maley). Theoretically, a larger animal would have an increased risk of cancer. A larger body means a vastly larger number of cells, and therefore, more cell divisions and a higher risk of DNA mutations. However, complex animals such as whales and elephants appear to have anti-cancer mechanisms that repress cancer more effectively than those of humans. Bowhead whales, in particular, are not cancer-prone and have an average life span of over 200 years (Firsanov, Denis et al.). During initial studies, the whales were found to be less equipped to handle mutations compared to humans. However, when scientists began studying how frequently the mutations occurred in nature, they discovered that whale DNA mutates at a lower rate than human DNA. Beyond that, the bowhead whale cells have evolved to have a more sophisticated version of the repair protein CIRBP. Humans also have a version of the CIRBP protein; however, it is less efficient and effective. When a double-stranded DNA breaks, the CIRBP protein speeds up the repair and flawlessly melds the two strands back together, meaning that the chances of there being a malignant DNA are far lower, and thus less risk of cancer (Firsanov, Denis et al.). When scientists put the whale version of the protein into human cells, the cells were more efficient at homologous joining, resulting in fewer mutations.

These findings are crucial for human cancer reasearch. I believe that animal cell research and human cancer research go hand in hand. Investing into animal cell research is key to understanding health and disease. Animal cell research uses techniques such as cell culture and

gene editing to mimic human biological processes. Using cell culture to grow the animal cells outside the body allows scientists to understand cancer and immunology in a controlled environment. This is key to understanding diseases and testing experimental treatments/vaccines. In the bowhead whale research case, the protein discovered, CIRBP, is a huge step in advancing anti-aging medicine and new cancer prevention mechanisms. These findings often come from the most unexpected places, which is why it is important to invest in this research. Animals, like humans, have evolved certain traits and characteristics to survive, and these traits could be the answers to many diseases.

Works Cited

Caulin, Aleah F., and Carlo C. Maley. “Peto’s Paradox: Evolution’s Prescription for Cancer Prevention.” *Trends in Ecology & Evolution*, vol. 26, no. 4, Apr. 2011, pp. 175–182, www.ncbi.nlm.nih.gov/pmc/articles/PMC3060950/, https://doi.org/10.1016/j.tree.2011.01.002.

Firsanov, Denis et al. “DNA repair and anti-cancer mechanisms in the long-lived bowhead whale.” bioRxiv : the preprint server for biology 2023.05.07.539748. 5 Nov. 2024, doi:10.1101/2023.05.07.539748. Preprint.