

Writing Assignment #4
Summary of a Genetics-Related Article found in the Popular Press
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The article “Return of the Dire Wolf” by Jeffery Kluger, published by Times Magazine, reveals the remarkable discovery of bringing back an animal that was once extinct for almost 10,000 years, the Dire wolf. Colossal Biosciences, which has been founded since 2021, took ancient, preserved DNA and genetic engineering to bring back the Dire Wolf. Using domestic dogs as surrogate mothers, they rewrote the genetic code of the common gray wolf to match the wolf’s genome. Thus brought the life of Romulus, Remus, and 2 month old Khaleesi, bringing back life that was once extinct.

How they did it was by making “surprisingly a few genetic changes” with the difference between a living species and an extinct one. Wolves have about 19,000 genes, we have close to 30,000. To create a Dire wolf, they made around 20 edits in 14 genes in the common gray wolf. However, making those adjustments lead to a rise of different characteristics in Romulus’ and Remus’ traits such as the white coat, larger mass, wider head, and larger teeth and jaws. They also saw a difference in their vocalizations when they howled and whined. How they were able to clone the Dire wolf was that they snipped a blood sample from the common gray wolf and then isolated cells. They selected cells that were known as endothelial progenitor cells (EPCs), which form the lining of blood vessels. Then, rewriting 14 key genes in the cell’s nucleus to match the Dire Wolf, the edits of the nucleus were transferred into an enucleated ovum. Making this change, the scientists produced 45 engineered ova, developing into embryos in the lab. After those embryos were developed into the wombs of two surrogate mixes, chosen by their health and not to their size, produced large pups. (1) “The idea that we could just take a vial of blood, isolate EPCs, culture them, and clone from them, and they have a pretty high cloning efficiency, we think it’s a game changer,” George Church said, Colossal co-founder, and professor of genetics at both Harvard University and Massachusetts Institute of Technology. Having the less invasive cell-sampling process will make procedures easier on animals. The Colossal Bioscience are now confident they are able to bring back the woolly monmouth especially since they are making progress on their test subject, mice, and create the woolly mouse.

However many scientists are very concerned and upset about the unveiling discovery. According to science writer Carl Zimmer, he proposed that it's (2) “just a gray wolf clone with 20 dire-wolf gene edits, and some dire wolf traits.” This sparks the question of ethics of genetic manipulation. Are these true dire wolves or just modified gray wolves? This implants the big focus on the ethical piece of manipulating genomes. It also brings up a key issue in today's modern genetics and bioethics. This entire article revolves around the study of applying genetics to conservation, evolution, and synthetic biology. This project shows how altering an organism's genotype, especially an extinct species, can influence its phenotype, one of the foundations of genetics. As well as raising the important question of the limits of genetic engineering and what truly defines a species on the ethical side. Overall, these articles showcase how genetics can be used not only to understand modern genetics but past genetics from over 10,000+ years. This can shape the future of biodiversity and conservation. Colossal bioscience mission is to restore Earth to a healthier state of what it once was, while solving the future economies and biological necessities of the human condition. They plan to do this through technological and engineering breakthroughs by using biosciences and genetics.

References:

- (1) Kluger, J. (2025, April 8). *The return of the dire wolf*. TIME. <https://time.com/7274542/colossal-dire-wolf/>
- (2) Kupferschmidt, K. (2025, April 8). *Is the dire wolf back from the dead? Not exactly*. Science. <https://www.science.org/content/article/dire-wolf-back-dead-not-exactly>