# Pioneering genetic conservation: from woolly mammoths to the 'poo zoo'



Researchers at Colossal Biosciences have made significant strides in genetic engineering with the recent creation of mice exhibiting woolly mammoth-like traits. This achievement, which has drawn attention to the potential for de-extinction, involves modifying the genetic makeup of these mice to express characteristics reminiscent of the long-extinct mammal. By altering seven specific genes, scientists have successfully generated mice with longer and thicker fur and increased body weight, attributes traditionally associated with mammoths.

The implications of this work extend beyond mere fascination with the mammoth itself. It forms a foundation for genetic engineering efforts aimed at reviving extinct species and addressing environmental challenges. According to Dr. Beth Shapiro, chief science officer at Colossal, the development of the woolly mouse serves as a validation of their de-extinction methodology, suggesting that complex genetic traits can be successfully integrated into living organisms. Through an analytical approach that studies the genomes of both mammoths and their closest living relatives, elephants, researchers have pinpointed key genetic divergence essential for adaptations to cold climates.

While the project presents innovative solutions for biodiversity conservation and climate change mitigation, it has also ignited ethical debates regarding the implications of such technological advancements. Critics express concerns over the moral implications of resurrecting extinct species and argue that these efforts may divert crucial resources away from current conservation needs. However, Ben Lamm, co-founder and CEO of Colossal Biosciences, contends that their work is geared towards utilising genetic technologies to confront ecological problems rather than "playing God". Lamm emphasises the importance of collaboration among scientists, ethicists, and conservationists to responsibly navigate this uncharted territory.

In a different conservation effort, researchers at Oxford University are embarking on an innovative project colloquially referred to as the "poo zoo," which aims to harness genetic diversity from animal dung to support endangered species survival. This method is predicated on the idea that animal waste is a potentially rich source of live cells—specifically those shed from the intestinal lining—providing an alternative, non-invasive avenue for genetic research. Prof. Suzannah Williams of Oxford leads this team, expressing optimism about the potential for cultured cells from dung to enhance genetic diversity within populations by exploring options for introduction into conservation strategies.

The overarching goal of the "poo zoo" project is rooted in the technique known as "genetic rescue." This strategy involves not only analysing DNA from animal cells found in dung for genetic insights but also cultivating these cells in a laboratory setting. If successful, this could facilitate the development of entire animals through advanced reproductive technologies, including cloning and in vitro fertilisation techniques. The approach could bypass the limitations posed by geographical separation and the logistics of collecting genetic material directly from endangered animals.

Nonetheless, both projects face specific challenges. The implementation of the "poo zoo" requires careful consideration of the inherent complexity in processing vast amounts of dung, alongside ensuring the viability of live cells extracted from this material, which is notable for its high bacterial content. Prof. Williams reiterated that techniques are being developed to isolate live cells while mitigating bacterial contamination.

As interest in these innovative conservation methods grows, experts caution that leveraging such technologies must be balanced with conventional conservation efforts. As noted by conservation experts, preserving current species and their natural habitats should remain a priority to prevent reaching critical endangerment levels, where methods like cloning may become the only recourse for survival.

Both the work at Colossal Biosciences and the "poo zoo" initiative exemplify the bid to rethink and redefine conservation strategies in a landscape marked by rapid biodiversity loss. As researchers navigate the complexities of modern genetic technologies, the discourse surrounding ethical considerations, resource allocation, and ecological impacts continues to be essential.

Source: [Noah Wire Services](https://www.noahwire.com)

## References

* <https://www.genengnews.com/topics/genome-editing/colossals-multiplex-edited-mice-replicate-woolly-mammoth-hair-traits/> - This article supports the claim that Colossal Biosciences has created mice with woolly mammoth-like traits by editing seven specific genes, demonstrating progress in genetic engineering and de-extinction efforts.
* <https://www.science.org/content/article/mouse-mammoth-s-pelt-makes-superfuzzy-debut> - This article corroborates the creation of genetically engineered mice with mammoth-like hair traits, highlighting the use of multiple gene editing technologies and the implications for de-extinction research.
* <https://www.cbsnews.com/news/mice-genetically-engineered-thick-hair-extinct-woolly-mammoth/> - This news piece provides additional details on Colossal Biosciences' achievement, including the challenges and ethical considerations surrounding de-extinction efforts.
* <https://www.genengnews.com/topics/genome-editing/colossals-multiplex-edited-mice-replicate-woolly-mammoth-hair-traits/> - This article further explains the methodology behind creating the woolly mice, including the analysis of mammoth and elephant genomes to identify key genetic traits.
* <https://www.cbsnews.com/news/mice-genetically-engineered-thick-hair-extinct-woolly-mammoth/> - This article discusses the broader implications of genetic engineering for conservation and the potential applications beyond de-extinction.
* <https://www.science.org/content/article/mouse-mammoth-s-pelt-makes-superfuzzy-debut> - This article highlights the ethical debates and skepticism surrounding de-extinction efforts, emphasizing the need for careful consideration of the consequences.