

Seeking an ethical approach to ancient DNA analysis

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Hora Rockshelter in Malawi, where recent excavations uncovered two of the individuals analyzed in a collaborative study of ancient DNA. Credit: Jacob Davis

The study of ancient DNA provides valuable insights into human history, including how ancient populations migrated and merged with each other. But discoveries drawn from this ancient genetic data can directly impact

the living in unexpected and even harmful ways.

Yet in many places, including the United States, research on ancient human tissues is only lightly regulated.

By contrast, any scholarly study of living human subjects, including [medical research](#), almost universally requires ethical clearance from an institutional review board. It may only proceed if the board is satisfied that the proposed study will minimize harm, that all individuals voluntarily decide to participate as [research subjects](#), and that all participants will be adequately informed of how their information or specimens will be used. Through this practice of "informed consent," study subjects may withdraw their participation at any time.

In an [article](#) published in July in the journal *Communications Biology*, Yale paleoanthropologist Jessica Thompson and co-authors Victoria E. Gibbon and Sianne Alves, both of the University of Cape Town, propose guidelines for a process of informed proxy consent for people and communities that ancient DNA research might affect.

"Results from ancient DNA analysis can affect living people well beyond what researchers would ever anticipate and, in some contexts, might directly cause harm, such as by impacting a community's land or restitution claims," said Thompson, an assistant professor of anthropology in Yale's Faculty of Arts and Sciences, who has led research involving the analysis of ancient DNA.

"We're advocating for a deeper consultation process between researchers and other interested parties to reduce the risk of harm. Such engagement will also improve research by adding new perspectives, ideas, and information from those who live where we work."

The use of ancient DNA analysis, which requires the destruction of

minute amounts of human tissue, has grown exponentially in recent years.

Technological and methodological innovations have opened new paths for using ancient genetic data to illuminate human history, evolution, and even health, Thompson said—pointing to the work of paleo-geneticist Svante Pääbo, who in 2020 co-authored a study demonstrating that gene variants inherited from Neanderthals make some people more susceptible to severe cases of COVID-19.

Pääbo was awarded the Nobel Prize in Physiology or Medicine in 2022 for his work on the genomes of extinct hominins and human evolution.

When scholarly disciplines advance rapidly, it raises concerns that related ethical considerations might lag, Thompson explained, adding that simply adhering to legal requirements is insufficient.

"Does the fact that your research practices are legal also make them ethical?" she said. "We all know that the answer is not an automatic 'yes.' Our aim is to help researchers demonstrate that they've undergone a process to address potential ethical concerns. It will help them to be transparent and hopefully avoid mistakes and accusations of unethical behavior."

In the piece, Thompson and her co-authors acknowledge the complexities of creating an ethical framework for research involving the genetic material of deceased individuals who are thousands of years removed from the living.

They also note that some cultural groups strongly identify with ancient peoples regardless of temporal distance. For example, Australian Aboriginal communities in the Willandra Lakes Region have demonstrated a strong cultural affinity to ancient humans and have

successfully sought the repatriation of remains that date as far back as Neanderthals, the authors explain.

They lay out specific steps researchers can take to obtain informed proxy consent from potentially interested parties, which could include descendant communities, caretakers of cultural knowledge who may or may not claim direct descent, people who live near the location of remains, local government officials, and institutions responsible for the stewardship of human remains.

The particulars of each situation will vary, and they emphasize that there is no "one size fits all" solution. "But it is better than stopping at the bare minimum," Thompson said. "The details will emerge through the proxy consent process."

The authors advise a set of considerations analogous to the process of obtaining informed consent in living human subjects research but tailored to the specifics of ancient DNA. For example, the authors suggest that researchers provide interested parties with a detailed overview of ancient DNA research and a description of their project, including its background, objectives, and expected outcomes.

After allowing time for those parties to consider the project, researchers should reengage with them to address any concerns and discuss plans for returning human tissue and how data extracted from it will be stored and curated, the authors explain.

The process reduces the risk of "parachute research," in which researchers from well-resourced institutions conduct work in less-resourced places, utilizing local infrastructure and people, and leave without returning or explaining their results to interested parties, the authors state.

Thompson, whose work focuses on [ancient peoples](#) who inhabited present day Malawi in eastern Africa, recently visited the country with the primary goal of sharing results of her earlier research with local parties. Obtaining funding for this purpose can be challenging, both for researchers who work with ancient DNA and those who work on DNA from living people, Thompson said.

For this reason, Thompson and her co-authors argue that funding agencies and institutions must adopt a more inclusive view of the "essential costs of research" in order to undertake good-faith efforts to obtain informed proxy consent.

The intention of the article is not to browbeat or scold researchers, Thompson explained, but to offer step-by-step guidance and checklists to help them engage with people potentially affected by their work.

"Collectively, the research community hasn't given enough thought to the risk this work can pose to people," she said. "I hadn't given it enough thought in my own work. This is an effort to craft a better approach to research that is not just more ethical, but also more interesting and productive. It's about working with communities, not just within them."

More information: Victoria E. Gibbon et al, Informed proxy consent for ancient DNA research, *Communications Biology* (2024). [DOI: 10.1038/s42003-024-06413-0](#)

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