

ETHICS

DNA Returned to Tribe, Raising Questions About Consent

A tiny tribe of Native Americans who live beneath the cliffs of the Grand Canyon is shaking up genetics research, thanks to an unusual out-of-court agreement with Arizona State University (ASU). Tribe members charged that their DNA had been collected by university researchers without proper consent; after a 6-year legal battle, the university has now agreed—among other concessions—to return more than 100 DNA samples to the Havasupai and pay \$700,000.

Although some tribe members had signed consent forms allowing blood samples collected 20 years ago to be studied broadly, they claimed in court that they had been told that the DNA would be used only for diabetes research. In fact, the data were used for a variety of studies. The outcome suggests that consent forms alone may not be enough to ensure that subjects understand how their samples may be used or to protect researchers.

that such data be shared, including through a database housed at the U.S. National Institutes of Health (NIH) called dbGaP. NIH requires that researchers it funds for genome-wide association studies, which scan large stretches of the genome for disease DNA, deposit data in dbGaP. The agency is considering a similar requirement for all genomic data, says Laura Rodriguez, a genetics policy staffer at the National Human Genome Research Institute in Bethesda, Maryland, who helped design dbGaP.

The Havasupai case is unique in some ways. Tribe members alleged that the samples were used for schizophrenia and ancestry studies that were deeply offensive to them. (The lead researcher, Therese Markow, now at the University of California, San Diego, denies that any schizophrenia work was conducted.) Lawsuits filed by the Havasupai, seeking more than \$50 million in damages, claimed that researchers took tribe members' blood without informed consent.



Six-year battle. Havasupai tribe member Rex Tilousi speaks after Arizona State University agreed to return DNA research samples and pay a cash settlement.

The case may seem a footnote to popular medical studies that collect DNA and health information from thousands of people in the hunt for new disease genes. But to dismiss it as a story about Native American beliefs “would be unfortunate,” says Hank Greely, a law professor at Stanford University in Palo Alto, California, who has followed the case closely. “The same sort of thing can happen to any of us.”

DNA samples matched with health histories are a precious resource, Greely says. Researchers are driven to use them as broadly as they can—whether to help ailing patients or to win tenure and grants. Pressure also comes from funding agencies, which demand

that researchers took tribe members' blood without informed consent. Markow strongly denies that charge; those who gave blood samples, she said in an interview, signed broad consent forms, and “a huge explanation was given about the kinds of research that might be done.”

Nonetheless, an uproar ensued. The Havasupai case has led other Indian tribes to refuse to participate in research. It also illustrates that “consent is not a form, it’s a process,” says Greely, who believes the tribe members didn’t realize there might be any studies beyond diabetes, even years later. One alternative strategy for DNA research, described in a 2006 paper by a Canadian geneticist who works with aboriginal communities, is that individuals loan DNA for specific studies and retrieve their samples when the research is complete. “Research subjects need to have some ability to assert their property interests in their own biological samples,” says Kimberly TallBear, who studies the role of science and technology in Native American governance at the University of California, Berkeley.

People who use dbGaP are well aware that

they must be cautious about studies that go beyond the original intent for a particular set of genetic and health data. There are “multiple and specific checks of this exact issue, who’s allowed to access the samples and for what purpose,” says David Altshuler of the Broad Institute in Cambridge, Massachusetts, who serves on a dbGaP working group. In some cases, data are restricted to certain types of studies, such as those pertaining to health but not ancestry. All dbGaP data—and most genetics information in other data banks worldwide—are stripped of identifiers.

Most individuals who contribute their DNA, some studies have found, want science to benefit broadly and are not interested in being contacted for additional consent. But others may feel differently. Last year, a group from the state of Washington reported at the American Society of Human Genetics meeting that some volunteers had qualms about plans to put data from an Alzheimer’s study in dbGaP. The local institutional review board had required that study leaders first ask subjects’ permission, an unusual request. Of the 1340 surveyed, 88% consented, while 9.5% refused. The researchers were struck that even those who agreed were grateful to have been asked.

Consent forms may talk in general terms about future use of data without explicitly mentioning dbGaP or other databases—in part because these data banks didn’t exist when many forms were drawn up. The generic approach seemed sufficient in the past: “There was this perception that if we go back and ask [participants], and they all say yes, did we really need to bother?” says S. Malia Fullerton, a bioethicist at the University of Washington, Seattle, who participated in the Alzheimer’s work. “That’s been driving a lot of thinking in the policy arena.” But, she says, researchers may want to reconsider. Given that dbGaP now includes data from 188,000 individuals, if even a few percent don’t want it there, “that’s a lot of people,” says Greely.

“Scientists had better be paying attention” to the Havasupai case, “and they better think how [their work] would look if publicized,” says Ellen Wright Clayton, who directs the Center for Biomedical Ethics and Society at Vanderbilt University in Nashville, Tennessee. Losing the trust of research participants would decimate genetics studies, she and others note—and such trust wouldn’t be easy to regain. **—JENNIFER COUZIN-FRANKEL**