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DNA testing helps with family histories

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As she swabbed the inside of his cheek, Patt Heise assured her 84-year-old father that she wasn't crazy, just curious. She mailed off the saliva sample and waited for results. Her dad died a month later, too early to find out what DNA testing had revealed - a list of potential relatives from all over the world and a migration chart dating back to Adam.

That would be "Genetic Adam," who lived between 70,000 and 140,000 years ago in Africa, scientists believe.

"People are really into genealogy or they think you are crazy and wasting your time," said Heise, 61, of Palatine, Ill., who acknowledges she is overwhelmed with the information but eager to use it to fill in her family tree.

"I really would like to see a book on 'DNA for Dummies.'"

Genetic testing for genealogists has gone mainstream, with costs plummeting as private companies refine their techniques and improve the accuracy of results. For as little as $99, anyone can order a do-it-yourself kit that comes in the mail, then submit their spit for analysis and receive results within six weeks.

Genealogy hobbyists liken the quest to track their family tree to a scavenger hunt, laden with clues, surprises and dead ends. For some, a snippet of genetic material has helped confirm a specific family tie or provide new leads when a paper trail has run cold. Others have blown up ancestral land mines along the way, shredding oft-repeated family stories

or, as in Heise's case, discovering a notorious distant relative.

"I found out I was related to Charles Manson - eeewww," Heise said, who hasn't been able to keep up with her email. Her account is filled with messages from strangers, at least one in German, asking about her family lineage because of DNA test results.

Recently, scientists used the technology to confirm the identity of a skeleton buried beneath a parking lot in Leicester, England, as King Richard III, who died in battle in 1485. The scientists matched the bones to two living maternal-line relatives, according to the University of Leicester, which conducted the analysis along with radiocarbon dating and a skeletal exam.

Closer to home, not everyone is excited about the DNA technology, as some remain cautious about privacy or simply don't see the need, such as Heise's dad. But for others who are adopted or are trying to explain a gap in their family tree, the tests may provide a crucial breakthrough, experts said.

"I think a lot of people find it of use to them, personally, especially if they are searching for a form of identity they are able to uncover in this way," said Noah Rosenberg, associate professor at Stanford University's Department of Biology and expert in evolutionary biology and genetics.

"Many people have a missing relative or have a parent die young and are searching for some kind of connection," he said. "We see a significant trend where African-Americans are searching for some understanding of the populations from which their ancestors originated from Africa."

There are no federal regulations that govern the direct-to-consumer ancestry tests, said Hank Greely, a Stanford law professor who specializes in the ethical, legal and social implications of new biomedical

technologies.

"Basically, both state and federal regulation only cover tests sold or done for health purposes," Greely wrote in an emailed response to questions.

"I would note that various false advertising statutes and regulations could be applied to genealogical testing - and, frankly, I think some of the sites are not always very clear about what they can and cannot detect."

EMOTIONAL DISCOVERIES

Meanwhile, as more people contribute their own DNA to the mix, the pool of potential genetic matches grows. Private companies store the saliva samples and promise more information in years to come - for additional fees - as technology improves.

Drawing from the large databases, scientists have been able to determine where groups of people who share matching threads of DNA likely came from and where they migrated.

Terri O'Connell, 41, of Chicago learned through Ancestry.com that she is 37 percent Scandinavian, "which I thought was a little weird. I am Irish, German and Hungarian," she said.

"The percentage was rather large," said O'Connell, who expects the company to release more information this year. "On their website, they group together people they think are related to you. ... I have almost 100 people in this list. It will break it down like, 'We think you are fourth or fifth cousin.'"

O'Connell started studying her family's Irish lineage because she was young when her grandparents died.

"I wanted to know who they were and what they went through," said O'Connell, who was saddened by some of what she found. "They had these big families ... but by the time you look back again, half the kids had died."

Early on, the DNA tests used in genealogy were limited to studying the male's Y chromosome, which is transmitted from father to son going back generations. The maternal line is traced in a different test, which looks at the mitochondrial DNA, known as mtDNA, which a mother passes to her children.

More recently, Ancestry.com began offering a full genome - or "autosomal" - test that analyzes all 23 chromosomes at more than 700,000 places. The test provides a more recent snapshot of the maternal and paternal line, experts said.

"It's like a unique fingerprint that only you have," said Ken Chahine, senior vice president and general manager of AncestryDNA. "By having that many locations that we can identify, we create a unique signature for you."

Family Tree DNA, based in Houston, sold about 300 kits when it first offered the service in 2000, President Bennett Greenspan said. Last year, "it was tens of thousands of kits."

For $219, the test now offers 11 times more information than it did the first year, while increasing the numbers of DNA markers identified, he said. The particular region of the DNA that is analyzed is called a marker. A test that examines more markers can be expected to provide more specific information.

"Over time, you can start doing more and more," Greenspan said. "If you were to test your mother and your father ... you start matching more

people, you figure out what line that came from."

The company has more than 400,000 people in its database, many of whom have discovered common ancestors, he said.

"The U.S. population is actually far more related than what people first thought," Greenspan said.

SEARCHING FOR GREAT-GRANDMA

For people who already have a good idea of their family tree, the DNA tests may not offer much new information but may help them confirm what they believe to be true.

That was the case of two women who did not know they were related until they stumbled across each other on a genealogy website in 2008.

That year, Mildred Lee Bozeman of Clinton, Utah, was searching for information on Anna Kathryn Vaughn, her great-grandmother, formerly of Shawneetown in downstate Illinois. Bozeman discovered that Maureen Wood, 76, of Dallas was looking for information about the same person.

"It appeared we were both looking for our great-grandmother," Bozeman, 38, said.

Wood had already discovered that in 1897 Vaughn put up three children for adoption - including Wood's grandmother, Emma Pate - through the Children's Home and Aid Society in Chicago. She and Bozeman have been trying without success to find out more about the other two children.

During their research, they discovered that Vaughn married four times

and gave birth to nine more children. After comparing family trees, Bozeman and Wood were "99 percent sure" they were related, but they wanted evidence. Each signed up for Ancestry.com's autosomal test, then compared results.

"We are second cousins!" Bozeman wrote in an email describing the findings. "What a relief it was to know the truth after all these years. However, our celebration was short-lived because there are more unanswered questions. What happened to our great-grandmother Kate's other two Pate children? Did they survive and did they have descendants and where are they? We will not be able to rest until we find them."

The Chicago-based National Society of Genetic Counselors cautions consumers about DNA testing that reveals both ancestral and medical information. The tests can be misleading if left unexplained by a professional counselor, President Rebecca Nagy said.

"One of the biggest drawbacks to these tests is they are only testing for a few genetic markers, and those few markers represent the tip of the iceberg," Nagy said.

Some people have contacted her office, concerned about results that showed they were at risk of developing cancer or Alzheimer's disease, while ignoring the bigger medical picture.

"Be prepared for what you learn, and know what questions to ask so you know what the implications might be," she advised.

In 2007, a company called 23andMe began offering both medical and ancestry information for $999, a spokeswoman said. Today, a more encompassing version costs $99 and promises 250 reports, including ethnic breakdowns and health risks.

"Whatever science can tell you about your DNA, we want to make it available," said spokeswoman Catherine Afarian, adding that participants can choose not to view their health report. "We try to build in control and choice."

For amateur genealogists like Heise, the information on her ancestry alone is enough to keep her busy for years. She has bins of documents left to sort through and 137 new potential relatives to track down, courtesy of DNA.

She has confirmed that her great-great-great-great-great-great-great-great-grandfather was a member of the "French 500" who settled in Gallipolis, Ohio.

And because the costs have dropped significantly since she sent in her father's DNA in 2010, she expects to learn more as additional genetic matches are made.

"There are people all over the world who are doing this," she said, "which is exciting and overwhelming at the same time."