

AncestryDNA reconstructs partial genome of person living 200 years ago

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AncestryDNA genetic scientists have pushed the boundaries of human genome reconstruction methods by using the DNA of many living people to reassemble an unprecedented proportion of the human genome attributed to a 19th Century American and his two successive spouses. This scientific feat is a step forward in the use of consumer genetics in family history, providing a glimpse into what a long ago ancestor may have looked like or which traits they may have passed down to descendants.

"Imagine if you could go back in time and see your ancestors. Would you see a part of yourself in one of them? Genetics is starting to answer questions about what an ancestor may have looked like and the specific traits they passed down to you. This is very exciting, not just for those exploring their family history, but in better understanding those who came before us," said Catherine Ball, Vice President of Genomics and Bioinformatics who led the effort at AncestryDNA.

Human genome reconstruction methods involve using science and technology to marry the past with the present. By using genetic material of living people, AncestryDNA has reassembled pieces of the human genome from a man named David Speegle and his successive spouses Winifred Crawford and Nancy Garren who lived in the early 1800's Alabama. With many children between the two marriages during his lifetime, David and his spouses Winifred and Nancy were excellent candidates for reconstruction given the number of living descendants that all potentially carry a piece of their DNA.

Ancestral Genome Reconstruction

The AncestryDNA team of scientists leveraged more than 500,000 DNA samples and 60 million family trees from Ancestry to form more than 150,000 DNA Circles. DNA Circles is a feature [now available](#) to AncestryDNA customers who subscribe to Ancestry that uses genetic information to connect people who are all likely descendants of a common ancestor. Most DNA Circles connect customers to an ancestor living four to six generations ago or about 150-200 years ago.

Leveraging the technology underlying DNA Circles, AncestryDNA scientists identified one of these shared ancestors as David Speegle. Using an approach similar to reassembling a document that has been shredded, the team was able to piece together fragments of genetic code from David Speegle and his spouses Winifred and Nancy for roughly 50 percent of the length of the [human genome](#). In some cases, the team was even able to identify pieces of the genome that were unique to David Speegle because of the unique family tree structure. Six generations back, everyone has 64 great-great-great-great-grandparents from whom they have inherited their DNA—thus, attributing segments of DNA to any one or two of them is an impressive feat.

"We've already learned some interesting facts about David Speegle and his spouses Winifred and Nancy," said Ball, "For example; we've identified pieces of the genome that indicate David Speegle or his spouses had a gene attributed to a higher likelihood of male pattern baldness. And David apparently passed along a gene needed for blue eyes." DNA technology, involving genome reconstruction and other methods, has the ability to fill in the holes in family lineages where historical records may drop off - providing a new way to experience [family history](#) and gain a better understanding of one's self.

"This is a significant achievement that will have implications in

population genetics, genealogy, anthropology and health and offers a preview into future advancements that will be made possible by large databases of genetic and genealogical information," said Dr. Kenneth Chahine, Senior Vice President and General Manager of AncestryDNA. "It feels like science fiction, but it is very much a reality and only the beginning. Future insights may come in the form of tracing the source of particular traits in a population, reaching a better understanding of recent population history and enabling more targeted genetic genealogy research."

The new DNA Circles experience and the genome reconstruction project are part of the AncestryDNA science team's ongoing efforts to explore the potential of genetic data, not only to improve the AncestryDNA service, but to bring the excitement around the possibilities of personal genomics to all. By leveraging AncestryDNA's expanding database of DNA samples paired with Ancestry family tree data, the team will continue to innovate in order to provide unique insights to both consumers and the scientific community— potentially even elucidating the genetic makeup of many more distant ancestors.

Provided by Ancestry.com

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