

Anthropologists clarify link between Asians and early Native-Americans

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A tiny mountainous region in southern Siberia may have been the genetic source of the earliest Native Americans, according to new research by a University of Pennsylvania-led team of anthropologists.

Lying at the intersection of what is today Russia, Mongolia, China and Kazakhstan, the region known as the Altai "is a key area because it's a place that people have been coming and going for thousands and thousands of years," said Theodore Schurr, an associate professor in Penn's Department of Anthropology. Schurr, together with doctoral student Matthew Dulik and a team of graduate students and postdoctoral researchers, collaborated on the work with Ludmila Osipova of the Institute of Cytology and Genetics in Novosibirsk, Russia.

Among the people who may have emerged from the Altai region are the predecessors of the first Native Americans. Roughly 20-25,000 years ago, these prehistoric humans carried their Asian genetic lineages up into the far reaches of Siberia and eventually across the then-exposed Bering land mass into the Americas.

"Our goal in working in this area was to better define what those founding lineages or sister lineages are to Native American populations," Schurr said.

The team's study, published in the <u>American Journal of Human Genetics</u>, analyzed the genetics of individuals living in Russia's Altai Republic to identify markers that might link them to Native Americans. Prior



ethnographic studies had found distinctions between tribes in the northern and southern Altai, with the northern tribes apparently linked linguistically and culturally to ethnic groups farther to the north, such as the Uralic or Samoyedic populations, and the southern groups showing a stronger connection to Mongols, Uighurs and Buryats.

Schurr and colleagues assessed the Altai samples for markers in mitochondrial DNA, which is maternally inherited, and in Y chromosome DNA, which is passed from fathers to sons. They also compared the samples to ones previously collected from individuals in southern Siberia, Central Asia, Mongolia, East Asia and a variety of American indigenous groups. Because of the large number of gene markers examined, the findings have a high degree of precision.

"At this level of resolution we can see the connections more clearly," Schurr said.

Looking at the Y chromosome DNA, the researchers found a unique mutation shared by Native Americans and southern Altaians in the lineage known as Q.

"This is also true from the mitochondrial side," Schurr said. "We find forms of haplogroups C and D in southern Altaians and D in northern Altaians that look like some of the founder types that arose in North America, although the northern Altaians appeared more distantly related to Native Americans."

Calculating how long the mutations they noted took to arise, Schurr's team estimated that the southern Altaian lineage diverged genetically from the Native American lineage 13,000 to 14,000 years ago, a timing scenario that aligns with the idea of people moving into the Americas from Siberia between 15,000 and 20,000 years ago.



Though it's possible, even likely, that more than one wave of people crossed the land bridge, Schurr said that other researchers have not yet been able to identify a similar geographic focal point from which Native Americans can trace their heritage.

"It may change with more data from other groups, but, so far, even with intensive work in Mongolia, they're not seeing the same things that we are," he said.

In addition to elucidating the Asia-America connection, the study confirms that the modern cultural divide between southern and northern Altaians has ancient genetic roots. Southern Altaians appeared to have had greater genetic contact with Mongolians than they did with northern Altaians, who were more genetically similar to groups farther to the north.

However, when looking at the Altaians' mitochondrial DNA in isolation, the researchers did observe greater connections between northern and southern Altaians, suggesting that perhaps females were more likely to bridge the genetic divide between the two populations.

"Subtle differences here both reflect the Altaians themselves — the differentiation among those groups — and allow us to try to point to an area where some of these precursors of American Indian lineages may have arisen," Schurr said.

Moving forward, Schurr and his team hope to continue to use molecular genetic techniques to trace the movement of peoples within Asia and into and through the Americas. They may also attempt to identify links between genetic variations and adaptive physiological responses, links that could inform biomedical research.

For example, Schurr noted that both Siberian and Native American



populations "seem to be susceptible to Westernization of diet and moving away from traditional diets, but their responses in terms of blood pressure and fat metabolism and so forth actually differ."

Using genomic approaches along with traditional physical anthropology may lend insight into the factors that govern these differences.

Provided by University of Pennsylvania

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