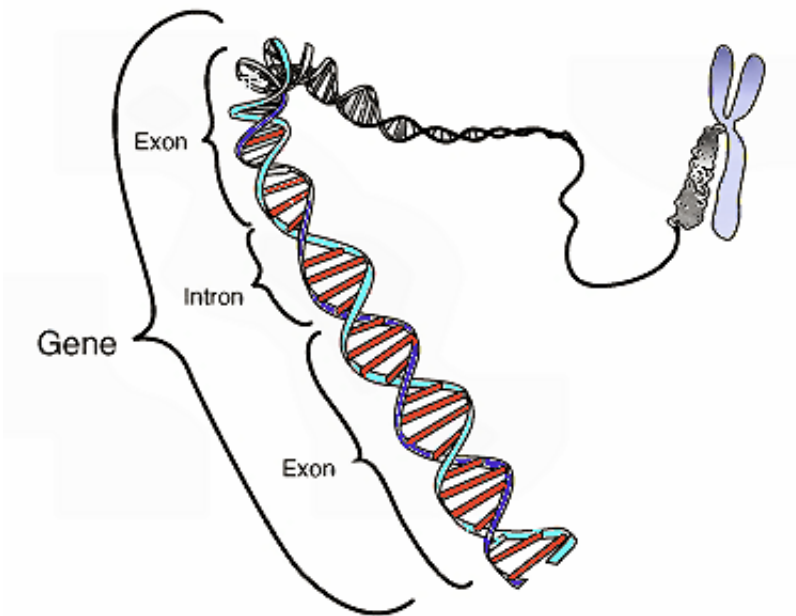


Genomic ancestry linked to mate selection, study shows

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This image shows the coding region in a segment of eukaryotic DNA. Credit: National Human Genome Research Institute

Genetic ancestry, as well as facial characteristics, may play an important part in who we select as mates, according to an analysis from UC San Francisco, Microsoft Research, Harvard, UC Berkeley and Tel Aviv University.

Researchers used population genomics and quantitative social sciences to gauge the relatedness of parents in a study of asthma in Mexican and

Puerto Rican children.

They found that the parents tended to choose partners with a similar mix of ancestry to their own, a phenomenon known as assortative mating. In the case of Mexicans, that meant having a similar proportion of mostly European and Native American ancestry, with some genomic heritage from Africa. For Puerto Ricans, that meant having similar amounts of European and African ancestry, with some Native American.

The average mix was similar enough to make the couples equivalent to between third and fourth cousins, a degree of closeness that may have implications for the perpetuation of some genetic diseases but also could have health benefits. A study done in Iceland, for example, found that the most fertile couples were about as closely related as fourth cousins.

Among the Puerto Rican, but not the Mexican couples, the researchers also found that parents had similar genes associated with [facial characteristics](#). The strength of the ancestry assortment in both groups was stronger than education assortment, a powerful factor in mate selection that has been well documented.

The researchers said their findings could affect a wide range of disciplines that employ population genomics.

"To avoid mathematical complexities, population and medical geneticists typically assume that people choose their mates randomly when modeling everything from demographic history to the diseases in a population," said Noah Zaitlen, PhD, an assistant professor of medicine at UCSF. "We now have evidence that these choices may not be random at all, and we should incorporate this new understanding to more accurately model human history and improve our understanding of the genetic basis of disease."

The researchers said it was important to keep in mind that they only found associations between factors like ancestry and partner selection, not evidence that one was influencing the other, and they warned that some of the factors they measured, like the genes known to be involved in facial development and genomic ancestry could be entangled with one another, or related to other factors they did not measure, like culture and religion.

Given their subjects' mixed European, Native American and African [ancestry](#), the researchers said their participants' high genomic diversity is likely to have contributed to a wider array of facial characteristics and may have magnified the effect of their tendency to choose similar-looking partners. The same thing could be happening in more homogenous populations, like European Americans, they said, but it could be harder to detect.

"To the extent that people assort based on physical appearance and cultural background, both factors can be correlated with individuals' genomic ancestries," said James Zou, PhD, a postdoctoral researcher with Microsoft Research in Cambridge, Mass. "In Mexican and Puerto Rican communities, there is greater diversity in individuals' genomic ancestries, compared to European Americans. If this is reflected in a greater diversity of physical appearances, this can contribute to stronger assortment."

The tendency to find a mate with a similar genetic background, a form of assortative mating, could also help perpetuate genetic diseases. In Puerto Ricans, who have founder mutations from both the Spaniards who colonized the island and the Native American women who bore their children, the researchers estimated that assortative mating could increase the prevalence of recessive diseases by 2 to 14 percent after 10 generations of mixing. And the researchers said it may help explain the high prevalence of certain diseases like asthma and Hermansky Pudlak

Syndrome among Puerto Ricans.

The researchers did not genotype the parents of the 2,757 trios they studied - about 1,246 of which were Mexican trios and 1,511 Puerto Rican trios - but rather inferred their relatedness through their children, who were genotyped. They also used a smaller study of 489 trios, in which both parents and children were genotyped, to validate their findings.

The researchers said more analyses should be done in other groups, to flesh out the implications of what they found.

"We need to understand how these patterns of assortment vary across diverse populations, as well, with finer geographic sampling of individuals," said Sriram Sankararaman, PhD, a postdoctoral fellow at Harvard Medical School.

More information: Genetic and socioeconomic study of mate choice in Latinos reveals novel assortment patterns, *PNAS*, www.pnas.org/cgi/doi/10.1073/pnas.1501741112

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