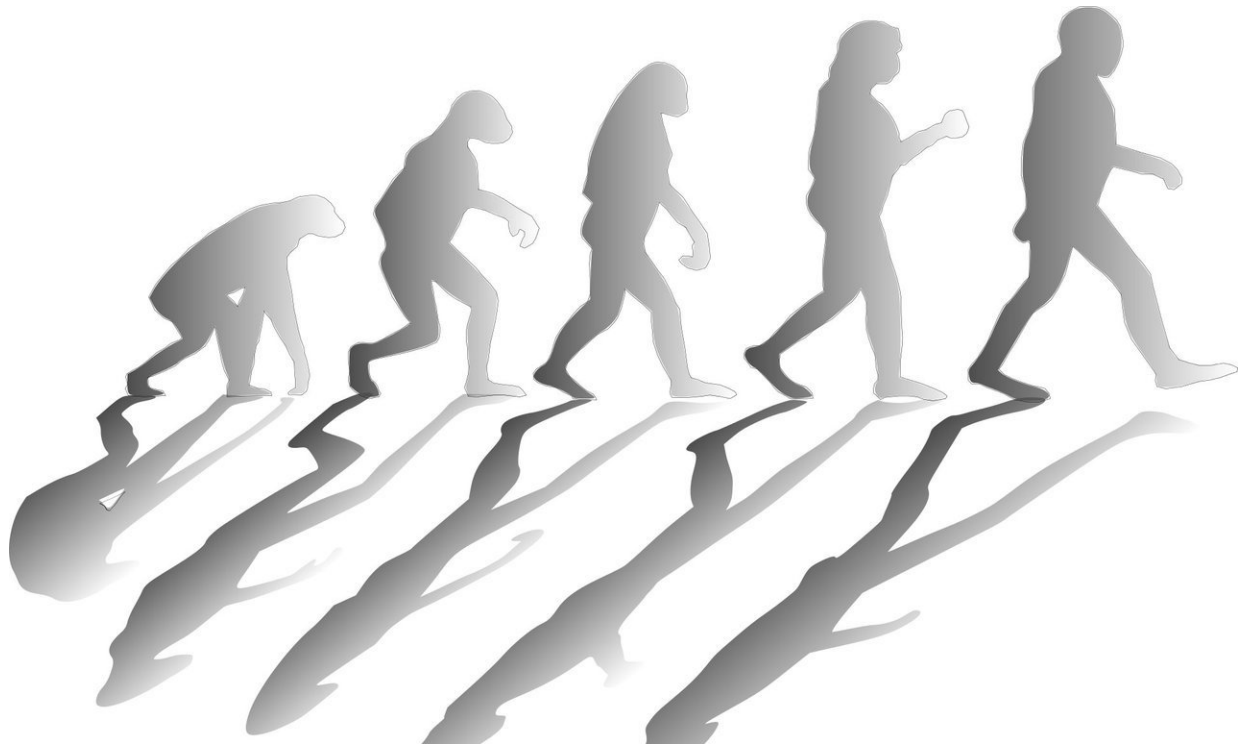


Does evolution make us or are we just drifting that way?

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Evolution may be responsible for a range of complex traits, including height and waist-to-hip ratio, and diseases such as schizophrenia, research from The University of Queensland shows.

The findings improve understanding of how [natural selection](#) shapes

human populations, and could lead to better prevention, diagnosis and treatment of complex diseases through an enhanced knowledge of their underlying genetics.

The study, led by Professor Jian Yang from UQ's Institute for Molecular Bioscience and Queensland Brain Institute, used more than 400,000 genetic samples from African, East Asian and European populations.

"Many human complex traits are concentrated in different populations around the world," Professor Yang said.

"For example, populations in the Northern Hemisphere tend to get taller the further north you go, and European Americans have a lower [body mass index](#) (BMI) than African Americans, but higher than Chinese, Indonesians or Thais.

"Environmental factors currently play a role, but most complex traits have a genetic component.

"The question is whether or not these differences are the consequence of natural selection or simply the result of what we call 'genetic drift' – where gene mutations (also called genetic variants) become more or less frequent in a population by chance."

Professor Yang and his colleagues set out to answer the question by testing to see if genetic variants were more differentiated across African, East Asian and European populations than expected under genetic drift.

They looked at a range of complex traits – including height, BMI, waist-to-hip ratio and cholesterol levels – and four [common diseases](#) – [coronary artery disease](#), type II diabetes, Alzheimer's disease and schizophrenia.

If genetic variants associated with a complex trait resulted from natural selection they should appear more frequently than expected under [genetic drift](#).

The analysis supported this, showing that the genetic variants associated with height, weight-to-hip ratio and schizophrenia were more differentiated than expected by random drift.

The genetic variants expected to affect height were higher in Europeans than Africans and East Asians and were consistent with observed differences between the populations.

"Our research was made possible by the availability of massive banks of genetic information that are being harnessed to shed new light on modifiable health risks that underlie common diseases."

The methods developed in the study, published in *Nature Communications*, are general and applicable to other complex traits.

More information: Jing Guo et al. Global genetic differentiation of complex traits shaped by natural selection in humans, *Nature Communications* (2018). [DOI: 10.1038/s41467-018-04191-y](https://doi.org/10.1038/s41467-018-04191-y)

Provided by University of Queensland

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