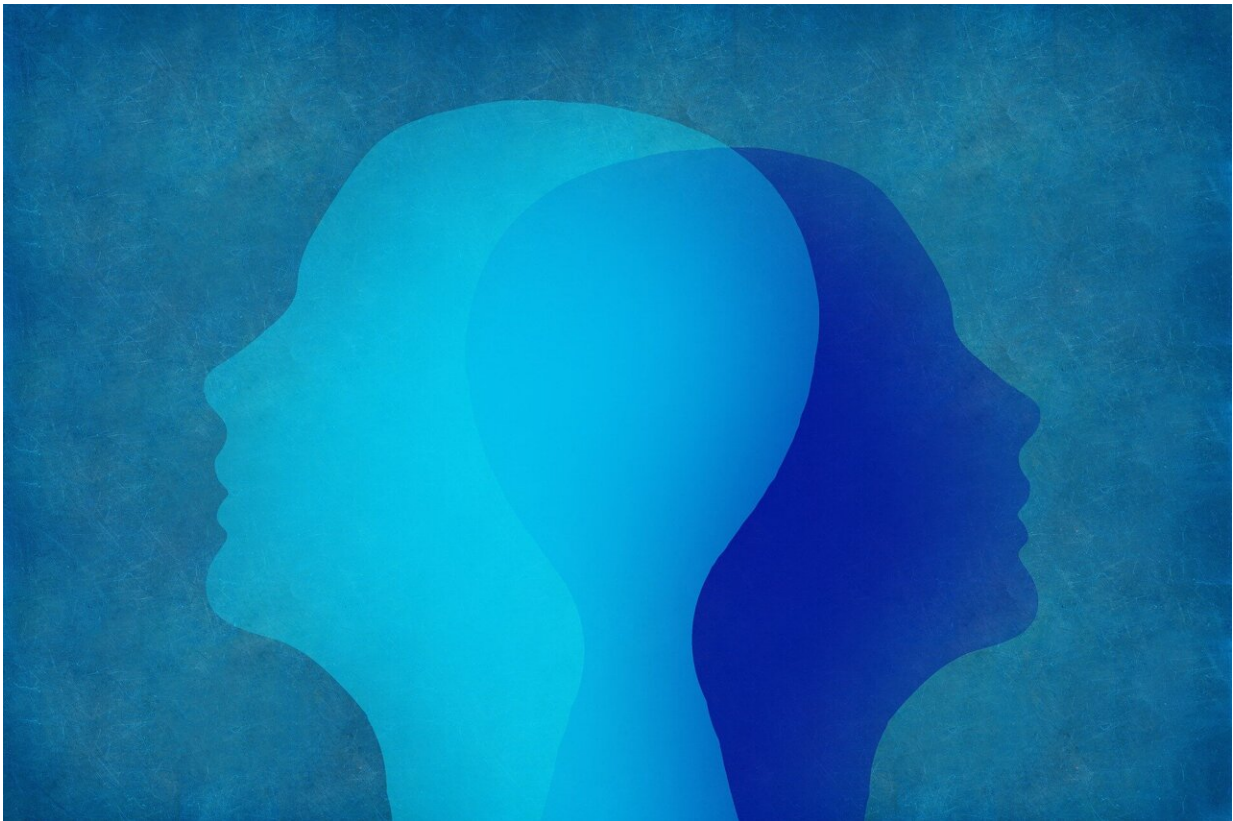


# New research investigates the genetic influences to health of circulating vitamin A

March 7 2024

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A Newcastle research team has been exploring the role of vitamin A in the pathogenesis of psychiatric disorders. The study, titled "Genetic influences on circulating retinol and its relationship to human health," is

[published](#) in *Nature*.

Professor Murray Cairns of the University of Newcastle and Hunter Medical Research Institute said the connectivity between neurons in the brain is thought to be altered in people with schizophrenia and other psychiatric conditions.

"Our previous research suggests this could be to do with vitamin A levels or [retinol](#) levels, which are known to play an important role in the differentiation, maturation and synaptic function of brain cells.

"Our new study by William Reay and colleagues combined the summary statistics from thousands of individual genomes to find out what [genetic factors](#) regulate retinol levels in blood. We essentially matched retinol levels with variation in genes to give us a better understanding of the genes involved in retinol absorption and transport in the blood," says Professor Cairns.

Beyond understanding the genetic architecture of retinol levels in humans, Professor Cairns says the real value of this research is to better understand its role in a range of complex health conditions.

"We can use the genetic variation that influences retinol as a proxy for levels of the vitamin in large genetic studies in millions of individuals in relation to more than 17,000 traits. This is a powerful method compared to [observational studies](#) because it's not confounded by correlation or reverse causation.

"Using this approach, we can support the significance of retinol in inflammation, plasma lipids, adiposity, vision, microbiome, brain structure/connectivity, asthma, COPD, and several other traits. This is significant because we use synthetic retinoids as drugs and potentially guide their application through a genetically informed precision

medicine approach. For example, people with [autoimmune diseases](#) have low levels of retinol.

"There's a lot more work that needs to be done to fully understand how retinol impacts human health but we do know that it is very important and potent. Like salt and sugar, we need enough of this vitamin but if we have too much or too little, it can cause all sorts of problems," says Professor Cairns.

Vitamin A is a fat-soluble nutrient that is abundant in meat, as well as green and orange plants. The plant form starts out as beta-carotene and the liver turns it into retinol.

Too much vitamin A can also be a problem for the [developing fetus](#) and therefore [pregnant women](#) and women of childbearing age should be careful with high dose supplements and retinoid drugs. It should always be taken under medical advice and in moderation.

"Retinol is hugely important for many aspects of our development; brain, immune system, skin and vision. It's really important to know what it does and how it can be used more effectively to improve [human health](#)," says Professor Cairns.

**More information:** William R. Reay et al, Genetic influences on circulating retinol and its relationship to human health, *Nature Communications* (2024). [DOI: 10.1038/s41467-024-45779-x](https://doi.org/10.1038/s41467-024-45779-x)

Provided by Hunter Medical Research Institute

Citation: New research investigates the genetic influences to health of circulating vitamin A (2024, March 7) retrieved 28 April 2024 from <https://medicalxpress.com/news/2024-03-genetic->

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