

Age-related diseases can be linked by genetics

April 19 2021



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In a research paper published in *Nature Aging*, the team reports using a novel approach to provide the first data-driven classification of multiple diseases obtained using human genetic and medical data freely available from the UK Biobank.

Co-author Professor Linda Partridge (UCL Institute of Health Aging and Max Planck Institute for Biology of Aging) said: "Advancing age is the main risk for major diseases, including cancer, dementia, and [cardiovascular disease](#). Understanding the molecular links between the aging process and age-related diseases could allow them to be targeted with drugs to improve late-life health.

"The striking finding from the study was that diseases with a similar age of onset were genetically more similar to each other than they were to diseases in the other three clusters."

The researchers based at UCL and the European Molecular Biology Laboratory's European Bioinformatics Institute (EMBL-EBI) uses data from the UK Biobank to investigate the genetic associations of 116 diseases including cardiovascular and gastrointestinal diseases, anemia, deep vein thrombosis, thyroid problems and depression. The researchers grouped these diseases based on their age of onset to define the relationship between [disease](#) incidence and age. This revealed genetic links between diseases with the same onset profile, suggesting that they may share a common cause.

The UK Biobank is a biomedical database that houses data from half a million UK participants. These participants regularly provide blood, urine and saliva samples, as well as detailed information about their lifestyle and the onset of any diseases. The database—the largest of its kind—is openly available to researchers working towards new scientific

discoveries that may improve public health.

Co-lead researcher Professor Dame Janet Thornton, Director Emeritus of EMBL-EBI, said: "Having access to [human health](#) and genetic data made this study possible. We couldn't have done anything like this without the UK Biobank. Many studies have used model organisms to look at aging and disease but humans are so much more complicated. If you really want to know about human aging you need access to human data."

This study uses a novel approach developed by Dr. Melike Dönertaş, first author on the paper at EMBL-EBI, to define a link between genetics and the onset of age-related diseases.

Dr. Dönertaş said: "There haven't been many studies that look at multiple diseases to see whether they have common genetic causes, so this was the motivation behind this study. We grouped diseases into age-of-onset profiles and found that diseases with similar profiles are also genetically very similar. We could also see that this shared genetics was associated with aging."

Professor Partridge concluded: "The results are important because they suggest that different stages in the aging process are associated with clusters of diseases with common underlying causes. These could therefore potentially be targeted to prevent or treat groups of age-related diseases simultaneously."

More information: Handan Melike Dönertaş et al. Common genetic associations between age-related diseases, *Nature Aging* (2021). [DOI: 10.1038/s43587-021-00051-5](https://doi.org/10.1038/s43587-021-00051-5)

Provided by University College London

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