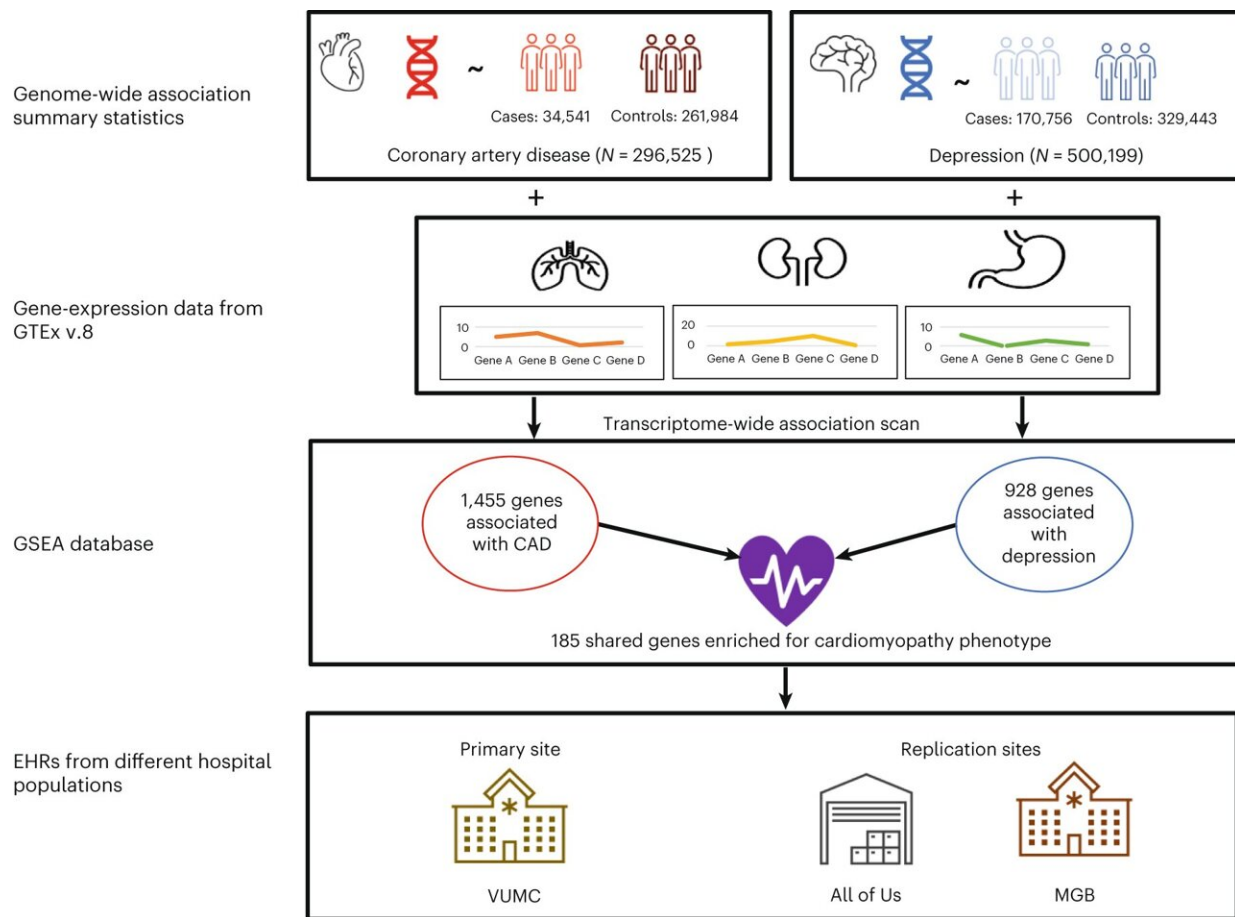


# Heart disease and depression may be genetically linked by inflammation

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Overall schematic of the study. Credit: *Nature Mental Health* (2024). DOI: 10.1038/s44220-024-00219-z

Coronary artery disease and major depression may be genetically linked

via inflammatory pathways to an increased risk for cardiomyopathy, a degenerative heart muscle disease, researchers at Vanderbilt University Medical Center and Massachusetts General Hospital have found.

Their report, published April 5 in the journal [\*Nature Mental Health\*](#), suggests that drugs prescribed for coronary artery disease and depression, when used in combination, potentially may reduce inflammation and prevent the development of cardiomyopathy.

"This work suggests that chronic low-level inflammation may be a significant contributor to both depression and cardiovascular disease," said the paper's corresponding author, Lea Davis, Ph.D., associate professor of Medicine in the Division of Genetic Medicine and Vanderbilt Genetics Institute.

The [connection](#) between depression and other serious health conditions is well known. As many as 44% of patients with [coronary artery disease](#) (CAD), the most common form of cardiovascular disease, also have a diagnosis of [major depression](#). Yet the biological relationship between the two conditions remains poorly understood.

A possible connection is inflammation. Changes in the levels of inflammatory markers have been observed in both conditions, suggesting that there may be a common biological pathway linking neuroinflammation in depression with atherosclerotic inflammation in CAD.

In the current study, the researchers used a technique called transcriptome-wide association scans to map [single nucleotide polymorphisms](#) (genetic variations) involved in regulating the expression of genes associated with both CAD and depression.

The technique identified 185 genes that were significantly associated

with both depression and CAD, and which were "enriched" for biological roles in inflammation and cardiomyopathy. This suggests that predisposition to both depression and CAD, which the researchers called (major) depressive CAD, or (m)dCAD, may further predispose individuals to cardiomyopathy.

However, when the researchers scanned large electronic health record databases at VUMC, Mass General, and the National Institutes of Health's All of Us Research Program, they found the actual incidence of cardiomyopathy in patients with the enriched genes for (m)dCAD was lower than in patients with CAD alone.

One possible explanation is that medications prescribed for CAD and depression, such as statins and antidepressants, may prevent development of cardiomyopathy by reducing inflammation, the researchers concluded.

"More research is needed to investigate optimal treatment mechanisms," Davis added, "but at a minimum this work suggests that patient heart and brain health should be considered together when developing management plans to treat depression or cardiovascular disease."

Kritika Singh, Ph.D., the paper's first author, is a former graduate student in the Davis lab who is now a postdoctoral Innovation Fellow at Novartis in Cambridge, Massachusetts.

**More information:** Kritika Singh et al, Genes associated with depression and coronary artery disease are enriched for cardiomyopathy and inflammatory phenotypes, *Nature Mental Health* (2024). [DOI: 10.1038/s44220-024-00219-z](https://doi.org/10.1038/s44220-024-00219-z)

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