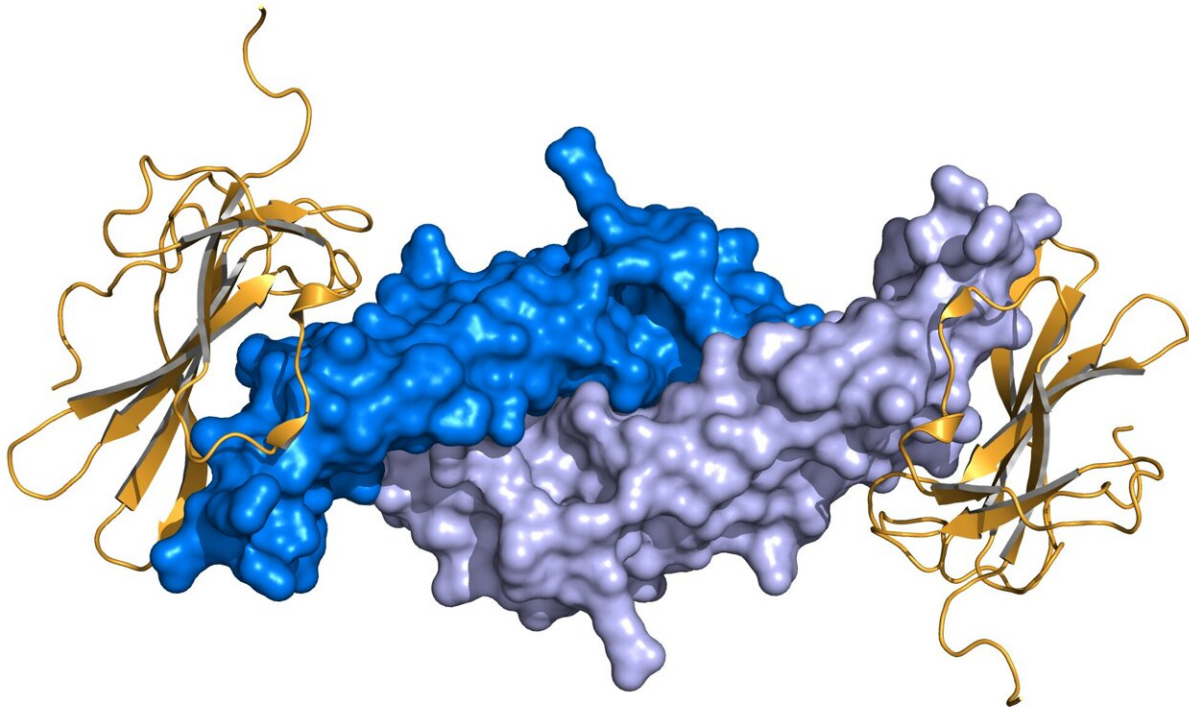


This hormone may be the missing ingredient to heart-healthy cholesterol levels for menopausal women

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3D crystal structure rendered in pyMol of Anti-müllerian hormone bound to its receptor, AMHR2. Credit: Drewhow, CC BY-SA 4.0 , via Wikimedia Commons

Step aside estrogen. Scientists at the University of Pittsburgh have discovered a predictor of blood lipid—or cholesterol—status for midlife women that may be key to understanding how hormone replacement therapy contributes to heart health.

In a study published today in the *Journal of Clinical Lipidology*, Samar R. El Khoudary, Ph.D., M.P.H., has identified a link between a lesser-known hormone called anti-Müllerian hormone (AMH) and lipid, or cholesterol, levels in midlife women. With this information, and with what is known about [estrogen](#), clinicians may get a better picture of cardiovascular risk for people entering [menopause](#).

"Estrogen is not the only story," said Dr. El Khoudary, a professor of epidemiology in Pitt's School of Public Health. "We are now getting more information about other markers that could play an important role and could more precisely and consistently tell women where they are in relation to their [menopause transition](#)."

Throughout the period before, during and after menopause, also known as the menopause transition, midlife women are at a heightened risk for cardiovascular disease with changes in their lipid levels, such as a sharp increase in LDL-C or "bad" cholesterol.

Scientists previously determined that this increased risk of [cardiovascular disease](#) might be partly due to a decrease in estrogen levels. However, estrogen replacement therapy has not had the

cardioprotective effects doctors were hoping for. Thus, scientists have been on the search for other factors that might be affecting cholesterol levels.

AMH is a hormone that is most well studied as an important factor for determining the gender of a fetus in utero. Recently, however, AMH was found to have a strong and reliable connection to the timing of the menopause transition and new technology is making it increasingly easy and cost-effective to monitor.

"AMH can be used to measure how long your ovaries can keep producing eggs," said Dr. El Khoudary. "The more eggs there are, the higher AMH; the fewer eggs, the lower the level of AMH. When the levels become very low, we can use it to predict menopause."

With such a strong connection between AMH and menopause, Dr. El Khoudary wondered whether, like estrogen, the loss of AMH might have an impact on cholesterol.

"We wanted to understand the mechanism behind lipid changes during the menopause transition and understand how this new biomarker, AMH, interacts with estrogen and impacts lipids," explained Dr. El Khoudary.

Dr. El Khoudary's team analyzed blood samples from the Study of Women's Health Across the Nation (SWAN), which followed a diverse group of 1,440 midlife women through the menopause transition. These blood samples were tested for estrogen and AMH levels as well as good and bad cholesterol.

Through this study, Dr. El Khoudary found that, while high estrogen level was important for lowering LDL-C or bad cholesterol levels, high AMH was responsible for lowering HDL-C or "good" cholesterol. This

means that as women traverse the menopause transition, they lose estrogen and AMH, increasing both their bad and good cholesterol levels.

This may sound contradictory but, to Dr. El Khoudary, it supports her suspicions that good cholesterol is not always good for menopausal women. Previous studies from Dr. El Khoudary's group have determined that good cholesterol levels in these women could be masking other cardiovascular issues and may even be a sign of HDL dysfunction, preventing good [cholesterol](#) from performing its cardioprotective duties.

In the future, Dr. El Khoudary hopes to examine [blood samples](#) from midlife women currently undergoing [hormone replacement therapy](#) to determine the effects of estrogen on AMH and lipid levels and to conclude whether these treatments are actually helping or hurting menopausal women. She hopes her studies will be able to better inform both patients and physicians when making decisions for their cardiovascular health.

More information: Samar R. El Khoudary et al, The independent associations of anti-Müllerian hormone and estradiol levels over the menopause transition with lipids/lipoproteins: The study of women's health across the nation, *Journal of Clinical Lipidology* (2022). [DOI: 10.1016/j.jacl.2022.11.008](#)

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