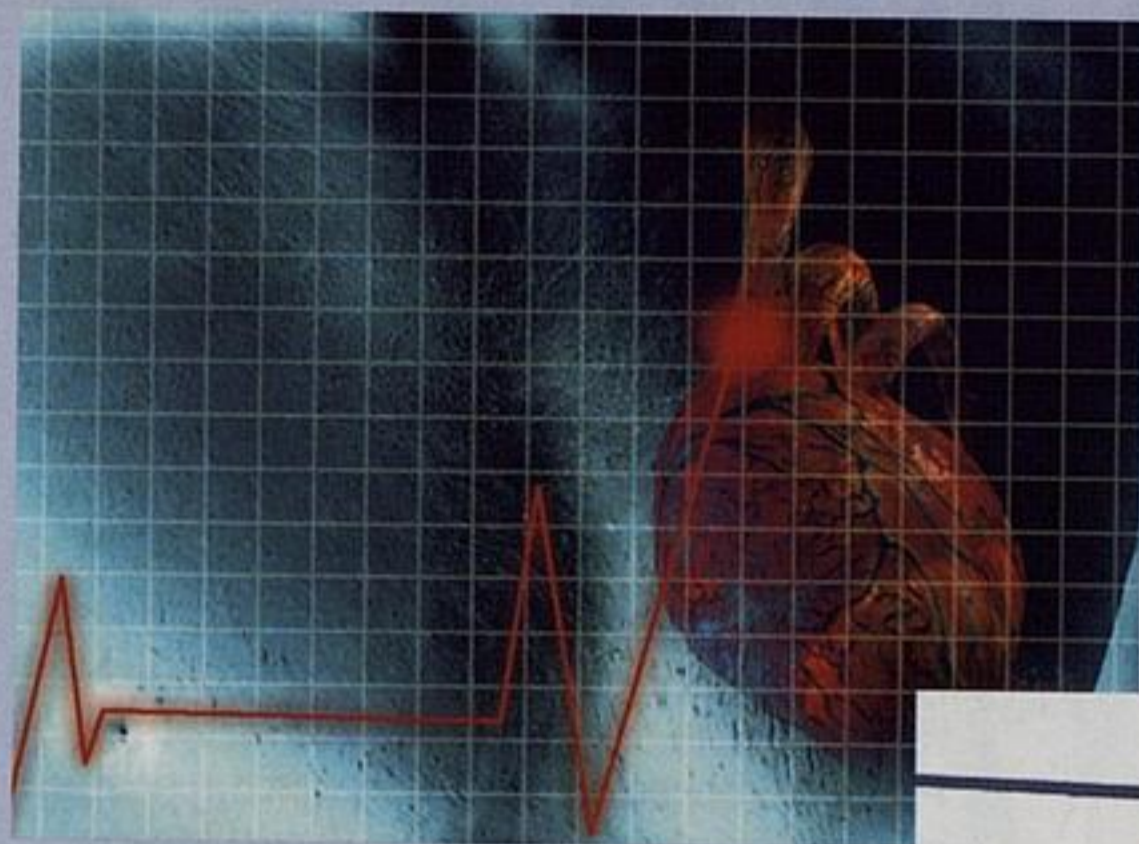


## New Findings about Heart Disease



A UK team led by Eric Smart, Ph.D., associate professor and vice chair of research, Department of Pediatrics, and the Barnstable-Brown Chair in Diabetes Research, UK College of Medicine, has found that estrogen, as well as estradiol, associated with HDL, may produce protection against heart disease.

**W**hat is good cholesterol? Does it lower the risk of heart disease? Does estrogen play a role in lowering the risk of heart attacks? Should postmenopausal women go on hormone replacement therapy (HRT) to prevent heart disease?

A UK study sheds new light on these questions by presenting a new picture of the roles of estrogen, estradiol (a form of estrogen used in HRT) and good cholesterol (high density lipoproteins, or HDL) in heart disease.

A UK team, led by Eric Smart, Ph.D., associate professor and vice chair of research, Department of Pediatrics, and Barnstable-Brown Chair in Diabetes Research, UK College of Medicine, has found that estrogen, as well as estradiol, associated with HDL, may produce protection against heart disease. This protection may come through stimulation of the production of nitric oxide, which lowers blood pressure and acts as an anti-inflammatory agent. HDL and estrogen act together, or concurrently, to stimulate the production of nitric oxide and provide cardioprotective results.

The study, published in the *Journal of Clinical Investigation*, produces a new model for examining the cardiovascular effects of HDL and estrogen, and may have future implications in the study of cardiovascular disease, as well as in women's health, particularly areas involving HRT.

The research team examined two factors associated with a decreased risk of developing cardiovascular disease, HDL levels and sex. Specifically, there is a decreased risk for heart disease given elevated HDL levels, and a decreased risk in premenopausal women.

In previous studies, it has been shown that HDL and estrogen stimulate the production of nitric oxide, which has

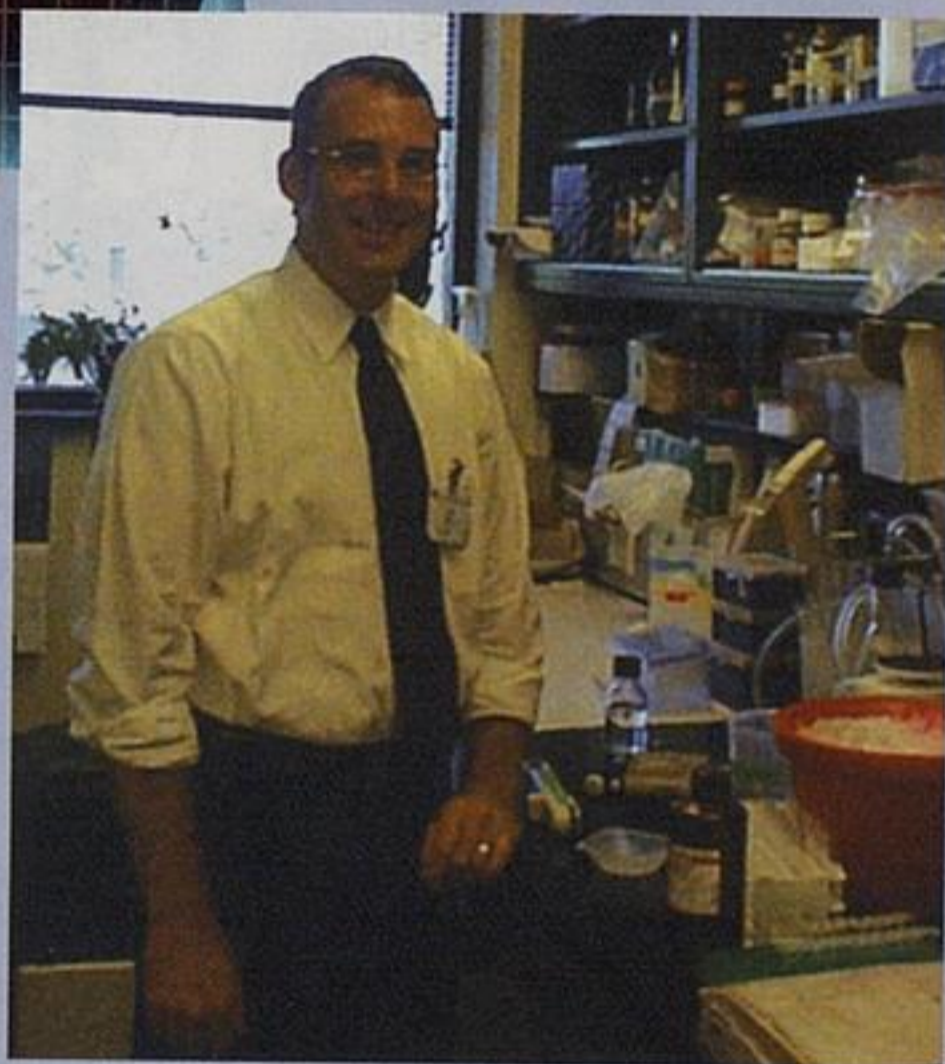


Photo: UK Public Relations

numerous protective effects in the cardiovascular system including lowering of blood pressure and anti-inflammatory effects. Given the earlier work, the research team tested the hypothesis that HDL and estrogen (and estradiol) work together to produce nitric oxide and provide subsequent cardiovascular benefits.

In studies using cell culture and animal models, it was found that male HDL and female HDL are different. HRT, estradiol specifically, worked in conjunction with HDL to produce nitric oxide, and potentially, cardioprotective effects.

In human studies, HDL isolated from women stimulated the production of nitric oxide, whereas HDL isolated from men had minimal activity. Also, HDL isolated from

premenopausal women or postmenopausal women receiving estradiol stimulated the production of nitric oxide, whereas HDL isolated from postmenopausal women did not.

In summary, the team, based on these results, concludes that HDL works with estrogen, as well as estradiol, in stimulating the production of nitric oxide. These studies establish a new model for examining the cardiovascular effects of HDL and estrogen, and may have future implications in the prevention and progression of cardiovascular disease as well as the use of HRT for cardioprotective effects.

The study is part of the \$8.3 million National Institutes of Health Center for Biomedical Research Excellence (COBRE) grant, the largest single grant ever to be awarded in the area of women's health at UK.



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