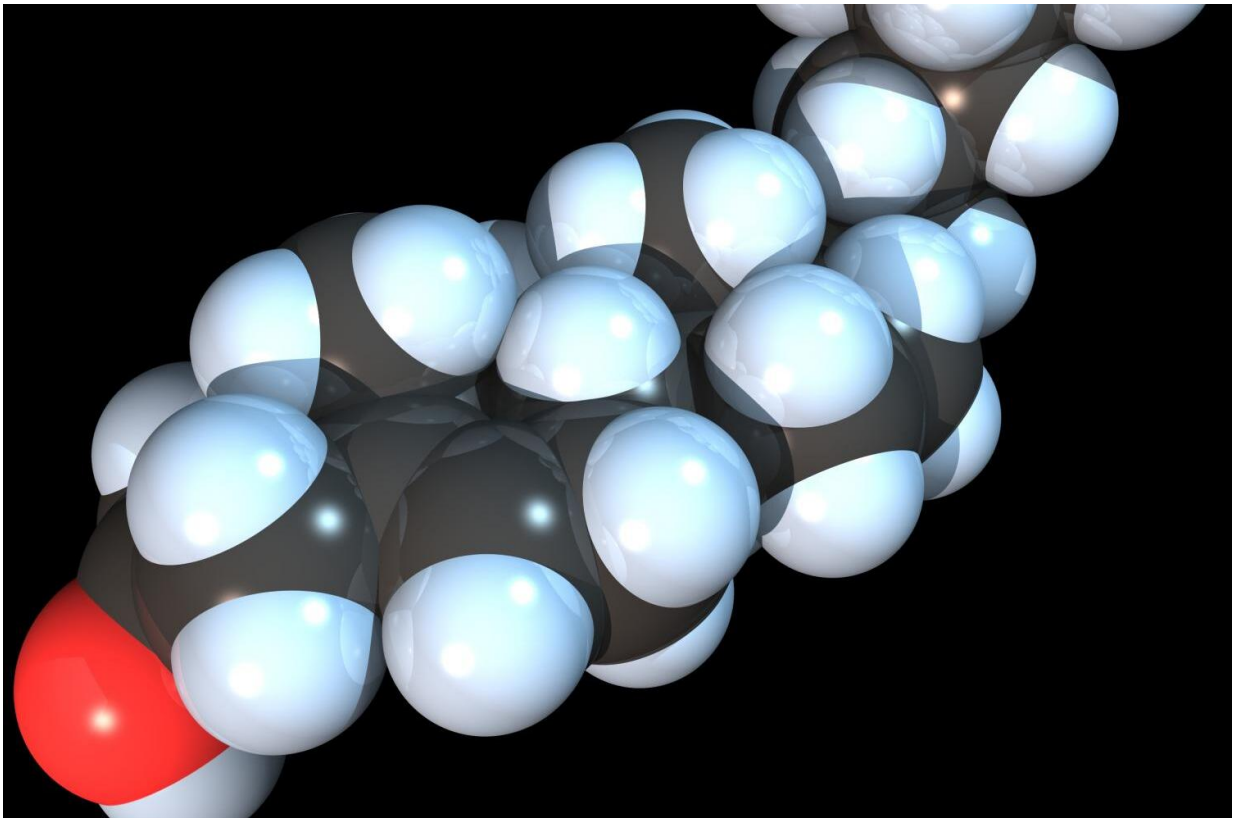


High-fat diet leads to same intestinal inflammation as a virus

June 22 2017, by David Olmos



Space-filling model of the Cholesterol molecule. Credit: RedAndr/Wikipedia

A new study by scientists at UCLA found that when mice eat a high-fat diet, the cells in their small intestines respond the same way they do to a viral infection, turning up production of certain immune molecules and

causing inflammation throughout the body. The scientists also found that feeding the mice tomatoes containing a protein similar to that in HDL, or "good cholesterol," along with the generic cholesterol drug Ezetimibe, reversed the inflammation.

The results could lead to new types of drugs, targeting the intestinal cells, to reduce people's risk of heart attacks and strokes, or to treat other conditions linked to inflammation, including cancer and [inflammatory bowel disease](#).

Researchers already knew that prolonged obesity can cause inflammation of the liver and fat tissues, and that this inflammation contributes to the development of diabetes and [heart disease](#). Studies have also shown that higher levels of high-density lipoprotein, or HDL, cholesterol, reduces a person's risk of heart disease.

The UCLA research team, led by Alan Fogelman, chair of the department of medicine at the David Geffen School of Medicine at UCLA, previously developed genetically engineered tomatoes that contained 6F, a protein resembling the main protein in [high-density lipoprotein](#). In early experiments on 6F, they found that the compound was active in the [small intestines](#) of [mice](#), and that it reduced inflammation. But exactly how it did this was unclear.

The scientists fed either a standard chow or a high-fat, high-cholesterol Western diet to mice that were especially prone to developing clogged arteries. They also treated some of the mice with either 6F, in the form of a tomato concentrate containing the protein, Ezetimibe, or both. After two weeks, cells from the small intestines of the mice were collected and blood samples were taken. The researchers measured cholesterol levels as well as the levels of inflammatory and immune molecules in both the intestines and throughout the body.

The findings shed light on the molecular details of how high-fat diets cause [inflammation](#) in the body, by making the intestines activate the pathway normally triggered by a virus. This suggests that blocking this immune reaction—as 6F and Ezetimibe do—may treat inflammatory diseases and decrease people's risk of heart attack and stroke.

The study was published June 7, 2017, in the *Journal of Lipid Research*.

More information: Pallavi Mukherjee et al. Transgenic Tomatoes Expressing the 6F Peptide and Ezetimibe Prevent Diet-induced Increases of Interferon- β and Cholesterol 25-hydroxylase in Jejunum, *Journal of Lipid Research* (2017). [DOI: 10.1194/jlr.M076554](https://doi.org/10.1194/jlr.M076554)

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