

Get to Know Your ApoE Genotype

What is the normal function of the *ApoE* (apolipoprotein E) gene?

It is the most common gene affecting cholesterol levels and determines how your body processes cholesterol and how it responds to dietary fat, alcohol and some medications.

The *ApoE* gene provides instructions for making a protein called **apolipoprotein E** which combines with fats (lipids) in the body to form molecules called lipoproteins. Lipoproteins are responsible for packaging cholesterol and other fats and carrying them through the bloodstream. Maintaining normal levels of cholesterol is essential for the prevention of disorders that affect the heart, brain and blood vessels (cardiovascular disease), including heart attack and stroke.

There are at least three slightly different versions of the *ApoE* gene: **E2**, **E3**, and **E4**. The most common form is **E3**, which is found in more than half of the general population. E2 and E4 are considered mutations of the gene. Individuals inherit one of these forms from each of their parents and thus have two copies. For example, if you inherit E3 from both parents, you have a combination called E3/3. Other possible combinations (**genotypes**) include E2/2, E2/3, E2/4, E3/4 and E4/4.

How are changes in the *ApoE* gene related to health conditions?

The E4 version of the *ApoE* gene increases an individual's risk for developing cardiovascular disease (known as ***atherosclerosis***, a progressive narrowing of the arteries that increases the risk of heart attack and stroke) and ***late-onset Alzheimer disease***. People who inherit one copy of the *ApoE* E4 gene have an increased chance of developing these diseases; those who inherit two copies of the gene are at even greater risk.

It is important to note that people with the *ApoE* E4 gene inherit an increased *risk* of developing atherosclerosis and Alzheimer disease, *not* the diseases themselves. In other words, ApoE E4 is neither necessary nor sufficient by *itself* to cause either disease.

What can I do if I have the ApoE E4 gene?

Because carriers of the E4 gene tend to absorb more fat from their diet than the average individual, a low-fat diet can typically help lower cholesterol levels and decrease risk of heart disease and stroke. Likewise, studies indicate that those who possess the E4 gene should avoid alcohol as it can increase risk of heart disease in these individuals (by suppressing production of good cholesterol).

We encourage all those patients with the E4 gene to consult with Dr. Jeff Emery who specializes in preventive medicine and undergo advanced testing to more fully evaluate their risk for heart attack, stroke and dementia. Much can be done through modern science and medicine to reduce our risk of these diseases if we simply take a proactive approach to our health!