Apolipoprotein ∈4 Allele
Fact Sheet for Patients

Carrier or Non-Carrier

- A part of the blood sample taken during your first visit (Visit 1) will be used to find whether you carry a gene that increases your chance of developing Alzheimer's disease. Genes come in pairs, each pair is known as an allele. The blood sample will be used to test whether you have the Apolipoprotein (ApoE) ∈4 allele. The information about your Apolipoprotein ∈4 allele will help us find out which study you can join. You will know from the blood sample whether you are a "carrier" or a "non-carrier" of the ApoE ∈4 allele.
- No other specific information about the results will be given to you or your caregiver.

What is the ApoE Gene?

ApoE is the only gene that researchers know increases the chance for developing late onset Alzheimer's disease. Every person inherits two copies (one from each parent) of the ApoE gene. Each copy of the ApoE gene is in one of three forms: ∈2 allele, ∈3 allele, or ∈4 allele. Therefore, every individual possesses one of six possible ApoE combinations.

What is the Job of the ApoE Gene?

The ApoE gene helps make a protein called apolipoprotein E. This protein combines with the fats in the body that are responsible for packaging cholesterol and other fats, carrying them through the bloodstream, and delivering them to the right areas of the body for processing.

What Role Does ApoE ∈4 Play in Alzheimer's Disease?

Of the three different forms of the ApoE gene, ApoE ∈4 is most likely to increase a person's chance of developing Alzheimer's disease. Having the ∈4 allele doesn't mean that a person will definitely develop Alzheimer's disease; it only increases the chance. Also, having the ∈4 allele does not predict when Alzheimer's disease might develop.

Beta-amyloid plaques & Neurofibrillary tangles

The brains of people with Alzheimer's disease have more of these two abnormal structures:

- Beta-amyloid plaques, which are thick areas of protein and cellular material. These plaques build up outside and around nerve cells
- Neurofibrillary tangles, which are twisted fibers that build up inside the nerve cells

Plaques and tangles usually develop as a person ages, beginning in areas devoted to learning and memory, and gradually spread to other areas. They develop faster in people with Alzheimer's disease. Although researchers do not know how the ApoE ∈4 allele changes plaque and tangle development, they know there is a link between having ∈4 and having more plaques and tangles.

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Risk Factors for Alzheimer's Disease

Everyone has some chance of developing late onset Alzheimer's disease. The average person has a 10 to 15 percent chance of developing Alzheimer's disease. This means that approximately 15 out of 100 people will get the disease by age 85. Things that may change this chance include age, ApoE genetic status, family history, gender, and ethnicity.

- AGE – Age increases a person's chance of developing Alzheimer's disease. The older a person gets, the greater his or her chance of developing Alzheimer's disease. Most people with Alzheimer's disease are aged 65 years or older.
- FAMILY HISTORY – Those who have one or more close family members with Alzheimer's disease are more likely to develop the disease than those without a family history.
- GENDER – Women have a greater chance of developing Alzheimer's disease than men.
- ApoE ∈4 – This is the only gene that researchers know increases the chance for developing late onset Alzheimer's disease. Having a specific form of the ApoE gene, ApoE ∈4, increases one's lifetime chance of developing late onset Alzheimer's disease. Having the ∈4 allele doesn't mean that a person will definitely develop Alzheimer's disease; it only increases the chance.
- ApoE ∈2 - Having the ApoE ∈2 form decreases one's lifetime chance of developing Alzheimer's disease. The ∈2 form is rare and may protect against Alzheimer's disease.
- ApoE ∈3 – This form is the most common. It might not affect a person's chance of developing Alzheimer's disease.
- ETHNICITY – Ethnicity may play a role in susceptibility to Alzheimer's disease.

For more information, visit **www.ICARAstudy.com**

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