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cell based solutions

NEURODEGENERATIVE DISEASES

ALZHEIMER DISEASE

APOE4 CELL LINES

Alzheimer's disease (AD) is a progressive neurodegenerative disorder and the most common cause of dementia. It is characterized by memory loss, cognitive decline, and behavioral changes.

The disease is associated with the accumulation of neurofibrillary tangles (NFTs) inside neurons, primarily composed of hyperphosphorylated Tau protein.
These pathological changes lead to synaptic dysfunction, neuronal death, and brain atrophy, particularly in regions responsible for memory and cognition. While the exact causes of AD are not fully understood, genetic and environmental factors contribute to its development.

Currently, there is no cure, but treatments aim to manage symptoms and slow disease progression.

Prot. Official Full Name: Apolipoprotein E4 (APOE4)
cDNA accesion number: NM_001302688.2
Resistance: G418
Storage: Liquid Nitrogen
Host cell lines:

P30757 - HEK 293 ($3x10^6$ cells/vial)
P30758 - Immortalized Astrocytes($1x10^6$ cells/vial)
P30759 - Immortalized Microglia ($1x10^6$ cells/vial)

Background

Apolipoprotein E4 (ApoE4) is one of the three major isoforms of the apolipoprotein E (ApoE) gene, which plays a key role in lipid transport and metabolism.

The presence of the ApoE4 allele is the strongest genetic risk factor for late-onset Alzheimer's disease. Additionally, ApoE4 has been associated with increased risk of cognitive decline and dementia in Parkinson's disease.

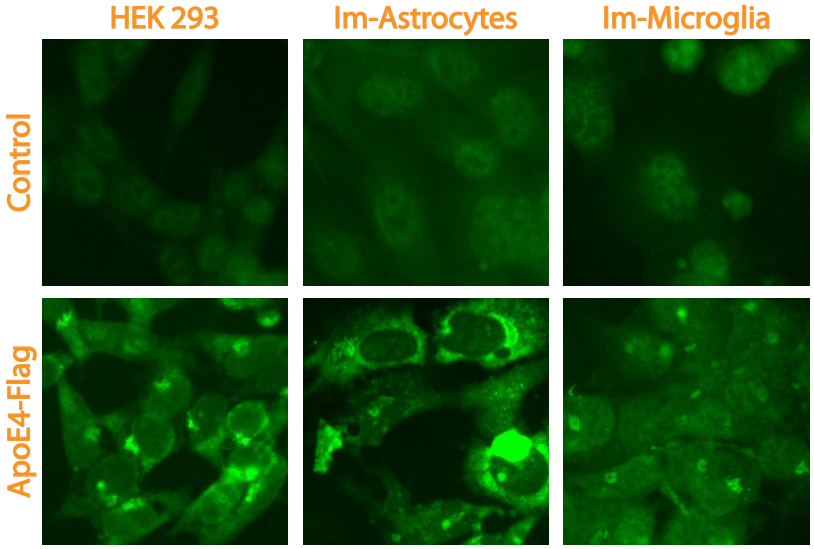

Figure 1. Immunofluorescence Analysis of ApoE4-FLAG overexpression. Immunofluorescence images show the expression of ApoE4-FLAG in untransfected HEK293 cells, immortalized astrocytes, and immortalized microglia (upper row) compared to the same cell lines overexpressing the ApoE4-FLAG construct (lower row). Primary Antibody: APOE Monoclonal Antibody (4E4) (Invitrogen MA5-16146).

NEURODEGENERATIVE DISEASES

Characterization of ApoE Expression in Cell Lines

HEK293, Immortalized Microglia, and Immortalized Astrocytes overexpressing ApoE4-FLAG are stably engineered to overexpress the ApoE4 isoform tagged with a C-terminal FLAG epitope, enabling easy detection and purification.

Protein overexpression has been validated by both immunofluorescence (Figure 1) and Western blot (Figure 2).

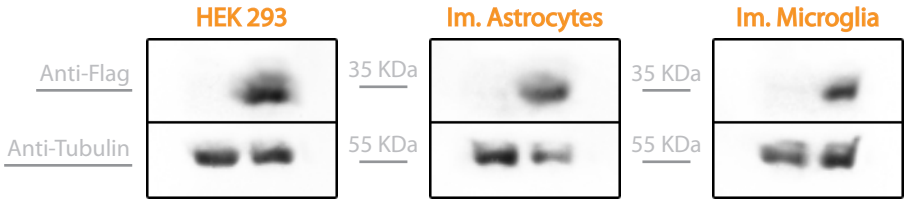

Figure 2. Western blot analysis showing overexpression of the ApoE4-FLAG construct. Each panel shows a Western blot with the untransfected cell lines in lane 1 and the overexpressing APOE-Flag cell lines in lane 2. Top row: Detection with Anti-Flag antibody (Thermo Fisher MA1-142). Bottom row: Detection with Anti-tubulin antibody (Invitrogen MA5-16308-HRP).

Additionally, active secretion of ApoE4 into the culture medium has been confirmed via ELISA (Table 1), ensuring functional expression and suitability for studies on lipid metabolism, neuroinflammation, and neurodegenerative disease mechanisms.

Cell Line	ApoE Levels
HEK 293	80 ng/ml
Imm. Astrocytes	60 ng/ml
Imm. Microglia	57 ng/ml

Table 1. Quantification of Secreted ApoE Protein by ELISA. ApoE levels secreted into the culture media were measured by ELISA after 48 hours of incubation in APOE-overexpressing HEK293 cells, as well as in immortalized astrocyte and microglia cell lines.

Applications

Investigating ApoE4-Driven Lipid and Cholesterol Dysregulation: Overexpression of ApoE4-FLAG in HEK293 cells enables the study of ApoE4's role in intracellular lipid trafficking and cholesterol homeostasis.

Modeling Neuroinflammation and Glial Activation in ApoE4 Context: Immortalized microglia overexpressing ApoE4-FLAG allow for the investigation of pro-inflammatory responses and cytokine release under stress or stimulus.

Studying ApoE4's Impact on Neuronal Support and Synaptic Modulation: Immortalized astrocytes expressing ApoE4-FLAG can be used to assess its effects on synaptic maintenance, glutamate clearance, and metabolic support to neurons.

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