

Product Information

Apolipoprotein E4 human recombinant, expressed in *Escherichia coli*

Catalog Number **A3234**
Storage Temperature $-20\text{ }^{\circ}\text{C}$

Synonym: Human rApo E4

Product Description

Apolipoprotein E (Apo E) has long been known to be a ligand for the low density lipoprotein (LDL) receptor and has recently been implicated as an important factor in nerve degeneration and regeneration. Ongoing research points to new roles for Apo E in neuron function and suggests potential ways in which the protein may be involved in the development of new therapeutics for crippling diseases in the neurological sciences.

The discovery that apolipoprotein E isoforms are associated with the progression of Alzheimer's disease in late-onset families renewed the interest in the function of this important member of the apolipoprotein family.¹ Researchers have shown there is a prevalence of Alzheimer's disease in individuals with the Apo E4 isoform. The role of Apo E isoforms in Alzheimer's disease is unclear. In one hypothesis, Apo E4 is less potent than Apo E3 in inhibiting nucleation of amyloid formation.² Another theory focused on the ability of Apo E3 and E2 to stabilize the neuronal microtubule protein Tau, preventing nerve cell death.

Molecular mass of rApoE: $\sim 34\text{ kDa}$ (SDS-PAGE)

pI (2-D gel electrophoresis):

~ 6.25 (rApo E2)
 ~ 6.35 (Apo E3)
 $6.55\text{--}6.7$ (Apo E4)

The pI values of Apo E2, E3, and E4 differ due to unique amino acid substitutions within the amino acid sequence.

	Residue	
	112	158
E2	Cys	Cys
E3	Cys	Arg
E4	Arg	Arg

It competes with iodinated human low density lipoprotein for binding to the human Apo B/E (LDL) receptor and binds to amyloid- β peptide in soluble binding assays.³ The recombinant human Apo E2, E3, and E4 isoforms retain full biological activity, enabling researchers to study interactions of ApoE isoforms with amyloid- β and Tau proteins as well as the LDL receptor.

Reagent

Supplied as a lyophilized powder from a $0.2\text{ }\mu\text{m}$ sterile filtered solution of 20 mM sodium phosphate, pH 7.8.

Purity: $>90\%$ (SDS-PAGE and HPLC)

Endotoxin level is less than $0.1\text{ ng per }\mu\text{g}$ ($1\text{ EU}/\mu\text{g}$).

Precautions and Disclaimer

This product is for R&D use only, not for drug, household, or other uses. Please consult the Material Safety Data Sheet for information regarding hazards and safe handling practices.

Preparation Instructions - Storage/Stability

Human rApoE is soluble in aqueous solutions. Reconstitute in water to a concentration of $0.1\text{--}1.0\text{ mg/ml}$.

This solution can then be diluted into other aqueous buffers and stored at $-20\text{ }^{\circ}\text{C}$ for future use. For extended storage, it is recommended to further dilute in a buffer containing 0.1% BSA. At concentrations $>1.0\text{ mg/ml}$, there may be no free monomer due to self-association common to the amphipathic apoproteins.⁴

Store the lyophilized powder at $-20\text{ }^{\circ}\text{C}$.

The lyophilized protein remains active for at least 2 years at $-20\text{ }^{\circ}\text{C}$. Reconstituted ApoE4 remains active for at least 3 months when stored in working aliquots with a carrier protein at $-20\text{ }^{\circ}\text{C}$. Avoid repeated freeze/thaw cycles.

ApoE may aggregate with repeated freeze-thaws. Freezing Apo E in ammonium bicarbonate solutions is the preferred method of storage. Avoid storage at 2–8 °C.⁵ In order to remove the ammonium bicarbonate, the solution should be dialyzed gently into the desired buffer. Lyophilization of Apo E is not recommended because some biological activities may be affected. If Apo E samples are lyophilized, in order to minimize self-association and aggregation of lyophilized samples, dissolve lyophilized powders in 0.7 M ammonium bicarbonate. Aggregates and multimers may still exist.

References

1. Corder, E.H., et al., *Science*, **261**, 921 (1993).
2. Evans, K.C., et al., *Proc. Natl. Acad. Sci. USA*, **92**, 763-767 (1995).
3. LaDu, M.J., et al., *J. Biol. Chem.*, **269**, 23403 (1994).
4. Formisano, S., et al., *J. Biol. Chem.*, **253**, 354 (1978).
5. Rall, S.C., et al., *Methods in Enzymol.*, **128**, 273 (1986).

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