



Product Information

Apolipoprotein E2 human, recombinant expressed in baculovirus infected Sf cells

Catalog Number **A2673**
Storage Temperature $-20\text{ }^{\circ}\text{C}$

Synonyms: Apo E2; Human rApo E

Product Description

Apolipoprotein E2 is a member of the apolipoprotein E family of plasma lipoproteins. It regulates plasma lipid levels by increasing the degradation of particles rich in triglycerides and cholesterol. It binds to LDL receptors and particles containing apolipoprotein E2 bind amyloid- β protein, the major component of plaques in Alzheimer's disease, which it delivers to the microglia, the major scavenger cells of brain. Compared to apolipoprotein E3, apolipoprotein E2 is associated with lower plasma LDL levels and may protect against the development of atherosclerosis. Apolipoprotein E2 also appears to be associated with reduced risk for Alzheimer's disease.

The discovery that apolipoprotein E (Apo 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 Apo E: $\sim 34\text{ kDa}$
(2-D gel electrophoresis)

pI (2-D gel electrophoresis):
 ~ 6.25 (rApo E2)
 ~ 6.35 (rApo E3)
 $6.55\text{--}6.7$ (rApo E4)

Minor acidic isoforms are also present and appear to be due to glycosylation and deamination differences.

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

Post-translational Modifications: 2-D gel electrophoresis reveals a complicated isoform pattern for hrApo E, reminiscent of the human serum Apo E pattern.³ Along with the primary hrApo E band, 3–4 additional bands occur at more acidic isoelectric points (pI), apparently representing sialylated and deaminated forms of hrApo E. The relative abundance of each recombinant isoform is in the range seen with human serum Apo E.

This human, recombinant product is expressed in baculovirus infected *Spodoptera frugiperda* cells and is supplied in a 0.7 M ammonium bicarbonate solution.⁴ It competes with iodinated human low density lipoprotein for binding to the human Apo B/E (LDL) receptor 1 and binds to amyloid- β peptide in a soluble binding assays.⁵ 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.

Purity: $\geq 90\%$ (SDS-PAGE)

Protein is determined by the Bradford method with BSA as the standard. Because ammonium bicarbonate interferes with this assay, the buffer should be included in all standards and blanks. Do not use other common protein assays such as the Lowry and BCA assays.

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

Human rApo E is soluble in aqueous solutions. At concentrations >1.0 mg/mL, there may be no free monomer due to self-association common to the amphipathic apoproteins.⁶

Storage/Stability

Store the product at -20 °C. Apo E may aggregate with repeated freeze-thaws. Freezing ApoE in ammonium bicarbonate solutions is the preferred method of storage. Avoid storage at 2-8 °C.⁷ 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 ApoE samples are lyophilized, in order to minimize self-association and aggregation, 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. Zannis, V.I., and Breslow, J.L., *Mol. Cell. Biochem.*, **42**, 3-20 (1982).
4. Gretch, D. et al., *PNAS USA*, **8**, 8530 (1991).
5. LaDu, M.J. et al., *J. Biol. Chem.*, **69**, 23403 (1994).
6. Formisano, S. et al., *J. Biol. Chem.*, **53**, 354 (1978).
7. Rall, S.C., et al., *Methods in Enzymology*, **128**, 273 (1986).

RBG,MAM 09/07-1

Sigma brand products are sold through Sigma-Aldrich, Inc.

Sigma-Aldrich, Inc. warrants that its products conform to the information contained in this and other Sigma-Aldrich publications. Purchaser must determine the suitability of the product(s) for their particular use. Additional terms and conditions may apply. Please see reverse side of the invoice or packing slip.