



## 人载脂蛋白 E 定量分析酶联免疫检测试剂盒

本试剂盒仅供科研使用。用于体外定量检测人血清、血浆或细胞培养上清液中的载脂蛋白 E 浓度。**使用前请仔细阅读说明书并检查试剂组分是否完整。**如有产品包装破损或质量投诉，请在收到货一个月之内联系我们。

### 载脂蛋白 E 简介：

载脂蛋白 E，是一个低密度脂蛋白，极低密度脂蛋白，高密度脂蛋白及乳糜的基本构成蛋白，是一个糖蛋白。成熟的载脂蛋白 E 的分子量为 34 千道尔顿。主要由肝细胞，巨噬细胞及神经系统中非神经细胞产生。

载脂蛋白 E 能够抑制 TNF- $\alpha$ ，Toll 样受体 3 和 Toll 样受体 4 介导的炎症反应，刺激和调整 T 细胞及增强 M2 型巨噬细胞的抑制炎症作用。载脂蛋白 E 在淀粉类代谢中起重要作用，在阿尔茨默氏病的发生中起重要作用。

### 检测原理：

本试剂盒采用双抗体夹心 ELISA 法检测样本中载脂蛋白 E 的浓度。载脂蛋白 E 捕获抗体已预包被于酶标板上，当加入标本或参考品时，其中的载脂蛋白 E 会与捕获抗体结合，其它游离的成分通过洗涤的过程被除去。当加入生物素化的抗人载脂蛋白 E 抗体后，抗人载脂蛋白 E 抗体与载脂蛋白 E 接合，形成夹心的免疫复合物，其它游离的成分通过洗涤的过程被除去。随后加入辣根过氧化物酶标记的亲合素。生物素与亲合素特异性结合，亲合素连接的酶就会与夹心的免疫复合物连接起来；其它游离的成分通过洗涤的过程被除去。最后加入显色剂，若样本中存在载脂蛋白 E 将会形成免疫复合物，辣根过氧化物酶会催化无色的显色剂氧化成蓝色物质，在加入终止液后呈黄色。通过酶标仪检测，读其 450nm 处的 OD 值，载脂蛋白 E 浓度与 OD<sub>450</sub> 值之间呈正比，通过参考品绘制标准曲线，对照未知样本中 OD 值，即可算出标本中载脂蛋白 E 浓度。

### 人载脂蛋白 E 定量分析酶联免疫检测试剂盒组成：

组分	规格 (96T/48T)
人载脂蛋白 E 预包被板	12 条/6 条
5× 标准品稀释液	20ml/10ml
人载脂蛋白 E 标准品	2/1 支 (冻干)
人载脂蛋白 E 生物素化抗体	10ml/5ml
亲和素连接的 HRP 酶	10ml/5ml
浓缩洗涤液 20×	30ml/15ml
TMB 底物	10ml/5ml
中止液	5ml/3ml
封板胶纸	3/2 张
说明书	1 份

### 标本收集：

- 标本的收集请按下列流程进行操作：
  - 细胞上清标本离心去除悬浮物后即可；
  - 血清标本应是自然凝固后，取上清，避免在冰箱中凝固血液；
  - 血浆标本，推荐用 EDTA 的方法收集；
  - 若待测样本不能及时检测，标本收集后请分装，冻存于 -20℃，避免反复冻融。
- 血清标本不应添加任何防腐剂或抗凝剂；
- 标本应清澈透明，检测前样本中如有悬浮物应通过离心去除。
- 请勿使用溶血，高血脂或污染的标本检测，否则结果将不准确。

### 注意事项：

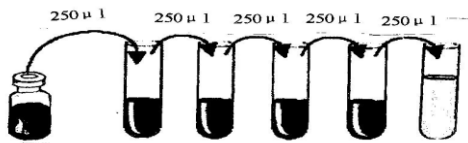
- 试剂盒请保存在 2~8℃。
- 浓缩洗涤液因在低温下可能有结晶，请水浴加热使结晶完全溶解后再配制工作液。



3. 标准品复溶加样后，剩余部份请丢弃。
4. 底物请勿接触氧化剂和金属。
5. 加样时，请及时更换枪头，避免交叉污染。
6. 严禁混用不同批号的试剂盒组份。
7. 充分混匀对保证反应结果的准确性很重要，在加液后请轻轻叩击边缘以保证混匀。
8. 室温反应，请严格控制在25-28℃。
9. 洗涤过程是至关重要的，洗涤不充分会使精确度下降并导致结果误差较大。
10. 试验中标准品和样本检测时建议作双复孔。
11. 加样过程中避免气泡的产生。
12. 血清和血浆标本的检测时，检测抗体的孵育时间应当适当延长

### 检测前准备工作：

1. 试剂盒自冰箱中取出后应置室温（25-28℃）平衡20分钟；每次检测后剩余试剂请及时于2~8℃保存。
2. 将浓缩洗涤液用双蒸水或去离子水稀释（1份加19份水）。
3. 如有5X标准品稀释液，请按所需量用双蒸水或去离子水稀释（1份加4水）。
4. 标准品：按标签复溶体积加入标准品稀释液复溶使载脂蛋白E终浓度达到4000pg/ml，室温反应，请严格控制在25~28℃，静置15~20分钟后轻轻混悬（建议抽吸几次）待彻底溶解，用标准品稀释液倍比梯度稀释后依次加入检测孔中。（标准曲线取七个点，最高浓度为4000 pg/ml，标准品稀释液直接加入作为0浓度。）



### 洗涤方法：

自动洗板机或人工洗板：每孔洗涤液为300ul，注入与吸出间隔15-30秒。洗板5次。最后一次洗板完成后将板倒扣着在厚吸水纸上用力拍干。

### 实验过程需自备的材料：

1. 不同规格的加样枪及相应的枪头；
2. 酶标仪；
3. 自动洗板机；
4. 去离子水或双蒸水；

### 操作步骤：

1. 通过计算并确定一次性实验所需的板条数，取出所需板条放置在框架内，暂时用不到板条请放回铝箔袋密封，保存于4℃。
2. 建议设置本底校正孔，即空白孔，设置方法为该孔只加TMB显色液和终止液。每次实验均需做标准品对照并画出标准曲线。
3. 分别将标本或不同浓度标准品（100ul/孔）加入相应孔中，用封板胶纸封住反应孔，室温（25-28℃）孵育120分钟。血清血浆，1500~6000倍稀释，如无明确范围，可从3000倍开始。尿样无需稀释，细胞上清，1~15倍稀释，可从2倍开始。
4. 洗板5次，且最后一次置厚吸水纸上拍干。
5. 加入生物素化抗体工作液（100ul/孔）。用封板胶纸封住反应孔，室温（25-28℃）孵育60分钟。
6. 洗板5次，且最后一次置厚吸水纸上拍干。
7. 加入亲和素连接的HRP酶工作液（100ul/孔）。用封板胶纸封住反应孔，避光室温（25-28℃）孵育20分钟。
8. 洗板5次，且最后一次置厚吸水纸上拍干。
9. 加入显色剂TMB100ul/孔，避光室温（25-28℃）孵育20分钟。
10. 加入终止液50ul/孔，混匀后即刻测量OD450值。

### 结果判断：

1. 复孔的值在20%的差异范围内结果才有效，复孔的值平均后可作为测量值。
2. 每个标准品或标本的OD值应减去本底校正孔的OD值。



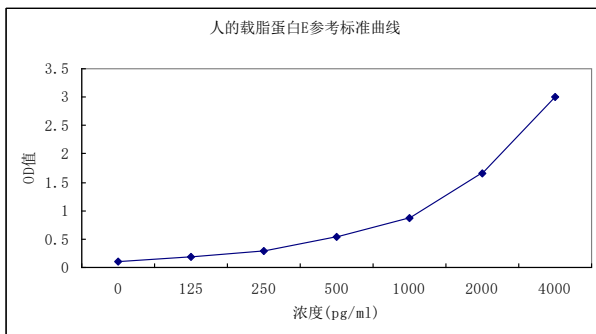
3. 手工绘制标准曲线。以标准品浓度作横坐标，OD值作纵坐标，以平滑线连接各标准品的坐标点。通过标本的OD值可在标准曲线上查出其浓度。

4. 若标本OD值高于标准曲线上限，应当稀释后重测，计算浓度时应乘以稀释倍数。

#### 典型数值和参考曲线

浓度pg/ml	典型OD值1	典型OD值2	OD平均值
0	0.097	0.109	0.103
125	0.186	0.202	0.194
250	0.287	0.303	0.295
500	0.512	0.56	0.536
1000	0.858	0.89	0.874
2000	1.623	1.707	1.665
4000	2.941	3.085	3.013

#### 人载脂蛋白E参考标准曲线



#### 灵敏度，特异性和重复性：

1. 灵敏度：多次重复结果表明，最小检出量为79.6pg/ml。
2. 特异性：与人的ApoA1、ApoA2、ApoB、ApoB100、ApoC1、ApoC2、ApoD等没有交叉反应。
3. 重复性：板内，板间变异系数均<10%。

#### 参考文献：

1. Mullick, A.E. et al. (2007) Arterioscler. Throm. Vasc. Biol. 27:339
2. Perugini, M.A. et al. (2000) J. Biol. Chem. 275:36758.
3. Krimbou, L. et al. (2004) J. Lipid. Res. 45:839.
4. Baitsch, D. et al. (2011) Arterioscler. Throm. Vasc. Biol. 31:1160.
5. Jones, P.B. et al. (2011) PLoS ONE 6:e14586.
6. Chroni, A. et al. (2005) Biochemistry 44:13132.



## ELISA Kit for the Quantitative

### Analysis of Human Apolipoprotein E

The human Apolipoprotein E ELISA (enzyme-linked immunosorbent assay) kit is used for detection of human Apolipoprotein E in cell culture supernatants, human serum and plasma. **THE ELISA KIT IS FOR RESEARCH USE ONLY.** Please read this instruction manual carefully and check out the material provided before use, and you can contact with our company if any questions. You can enter our website or call us for other aim.

#### Introduction

ApoE, a glycoprotein, is a structural component of serum LDL, VLDL, HDL, and chylomicrons. Mature human ApoE is a 34 kDa protein. It is produced predominantly by hepatocytes, macrophages, and non-neuronal cells in the central nervous system.

ApoE suppresses TNF- $\alpha$ , TLR3, and TLR4 mediated inflammation and promotes the development of regulatory T cells and anti-inflammatory M2 macrophages. ApoE also plays a critical role in amyloid metabolism and the development of Alzheimer's disease.

#### Principles of the Test

The kits is a solid sandwich enzyme-linked immunosorbent assay for detection of human Apolipoprotein E. An anti-human Apolipoprotein E monoclonal antibody has been absorbed onto the wells of the microtiter strips provided. Samples including specimens or standards were pipetted into wells. The human Apolipoprotein E in specimens or standards would be captured by the coated antibody and the free others were removed by washing. The human Apolipoprotein E biotin-conjugated antibody were added and binds to human Apolipoprotein E captured by the first antibody, which formed a sandwich. Streptavidin-HRP would be added and binds to the biotin conjugated antibody, then free Streptavidin-HRP would be removed during a wash step. After this, substrate solution would be added and catalyzed by the HRP, and a coloured product is formed. The intensity of the colored product is used to calculate in proportion to the amount of human Apolipoprotein E in the original specimen.

#### Materials provided with the kits:

Reagent	96/48Test Kit
Human Apolipoprotein E Antibody-Coated Wells	12 strips/6 strips
5 $\times$ Standard Diluent	20ml/10ml
Human Apolipoprotein E Standard	2/1 vial(s)
Human Apolipoprotein E Detection Antibody	10ml/5ml
Streptavidin-HRP	10ml/5ml
Wash Buffer Concentrate 20 $\times$	30ml/15ml
TMB	10ml/5ml
Stop Solution	5ml/3ml
Plate Covers	3/2
Complete Instruction Manual	1

#### Specimen Collection

- Collecting specimen as following:
  - The particulate of the cell culture supernatants should be removed before use.
  - Serum was obtained from clot at room temperature.
  - Please collect plasma with EDTA.
  - Assay immediately or store samples at -20 $^{\circ}$ C. Avoid free-thaw cycles.
- Antiseptic and anticoagulant should not appear in Serum samples.
- Any particulate should be removed from samples before use.



4. Do not use grossly hemolyzed or lipemic samples.

**Note: Strongly recommend that the serum and plasma samples should be diluent as doubling dilution before use.**

### Precautions for use:

1. Please storage the Kit at 2~8°C.
2. Washing buffer concentrate may have crystal in low temperature, and you can melt its in water-bath before use.
3. Please discard the remains after use of the dissolved standard.
4. Avoid contact of substrate solution with oxidizing agents and metal.
5. Usage of disposable pipette tips avoid microbial contamination or cross-contamination of reagents or specimens.
6. Do not mix or substitute reagents with those from other lots or other sources.
7. To ensure the adequate mixture of added reagents, please tap gently the plate after the wells were filled with liquid.
8. Incubation temperature should be 25~28°C.
9. Wash step was crucial for whole assay process.
10. Duplicate wells of the same sample were recommended in assay process.
11. Avoid the foam while pour the liquid into wells.
12. For serum or plasma samples, the biotin-conjugated antibody should be incubate for at least 90 minutes.

### Reagent Preparation

1. The reagents should be warmed up to room temperature before use. The remanent reagents must reseal and put into refrigeratory again as soon as possible.
2. Dilute 1ml of wash buffer Concentrate into 19ml deionized or distilled water to work.
3. If you have a 5x standard diluent, please dilute it with double steaming water or deionized water.
4. Add standard diluent to the bottle according to the volume of the label and wait 15 minutes for complete dissolution. Incubation temperature should be 25~28°C. And in turn add the half concentration diluent by standard diluent.

### Wash step:

Automated microplate washer or operating by pipette: Each well should be pour into 300ul wash buffer and soak 15 or 30 seconds, then be aspirated, five times process were repeated. After the last wash, remove remaining wash buffer by aspirating. Invert the plate and blot it against clean paper towels.

### Materials Required But Not Provided

1. pipettes and pipette tips
2. Microwell strip reader capable of reading at 450 nm (540 nm as optional reference wave length)
3. automated microplate washer
4. Glass-distilled or deionized water

### Assay procedure

1. The needed strips were putted into the frame, the remains were returned into foil pouch and resealed.
2. Blank well were recommended, which only color reagent and stop solution be added. It is suggested that each testing with gradient density of standard for standard curve.
3. Add 100ul of standard or sample. Cover with the Plate Covers provided. Incubate for 2 hours at room temperature. If the serum or plasma sample, you should diluent from 1500 to 6000 times, you can start with 3000times diluent while have no scope. If the cell culture supernatants, you should diluent 2 times for the assay or diluent further more.
4. Five times wash process were repeated.
5. Add 100ul of detetion antibody. Cover with the Plate Covers provided. Incubate for 1 hour at room temperature.
6. Five times wash process were repeated.
7. Add 100ul of Streptavidin-HRP. Cover with the Plate Covers provided. Lucifugal incubation for 20 minutes at room temperature.
8. Five times wash process were repeated.
9. Add 100ul of TMB, Lucifugal incubation for 20 minutes at room temperature.
10. Add 50ul of stop solution to each well, determine the optical density of each well within 10 minutes.



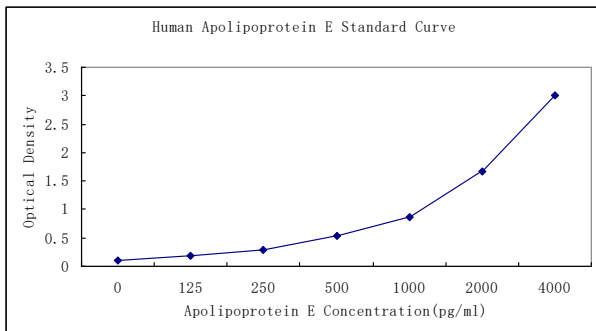
## Calculation of Results

1. Duplicates should be within 20 percent of the mean. Average absorbance values for each set of duplicate samples were used as detection results.
2. The blank absorbance values of subtract should be deducted.
3. Drawing a best fit curve through the points of graph. Draw the standard curve by plotting assayed OD value (on the Y axis) vs. concentration (on the X axis). The sample concentration was obtained based on its OD value founding in the standard concentration curve.
4. If the values obtained are not within the expected range of the standard, Samples should be dilute and assay again.

## Typical Data and Standard Curve

Concentration (pg/ml)	Typical data 1	Typical data 2	Average
0	0.097	0.109	0.103
125	0.186	0.202	0.194
250	0.287	0.303	0.295
500	0.512	0.56	0.536
1000	0.858	0.89	0.874
2000	1.623	1.707	1.665
4000	2.941	3.085	3.013

### Human Apolipoprotein E Standard Curve



## Sensitivity, Specificity, Repeatability

**Sensitivity:** repeated assays were evaluated and the minimum detectable dose was 79.6 pg/ml.

**Specificity:** No significant cross-reactivity or interference with human ApoA1, ApoA2, ApoB, ApoB100, ApoC1, ApoC2, ApoD.

**Repeatability:** The coefficient of variation between wells or plates is less than 10 per cent.

## REFERENCES:

1. Mullick, A.E. et al. (2007) Arterioscler. Throm. Vasc. Biol. 27:339
2. Perugini, M.A. et al. (2000) J. Biol. Chem. 275:36758.
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