



人的C反应蛋白CRP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CRP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。

CRP简介：

C反应蛋白（CRP）是人体内的急性反应蛋白，在人体免疫防御反应中重要的介导体，属于穿透素家族的蛋白。CRP蛋白的前体蛋白是224残基的蛋白，成熟的CRP有206个酪氨酸残基，通过非共价结合的方式形成五聚体的环状结构。

无论是感染还是非感染性的炎症、组织坏死和恶性肿瘤时，人体血液中的CRP蛋白浓度都会急剧升高。在感染，炎症反应及组织坏死中，人血清中的CRP蛋白在24~48小时内可急剧升高到正常水平的1000倍。

在许多种细菌和真菌表面的胆碱磷酸是CRP蛋白的配体，CRP与配体的结合是依赖Ca²⁺的。CRP也可与受伤细胞的膜、坏死的胞核和调亡的细胞等结合。一旦与受体结合，CRP蛋白就会启动C1q，从而引起一系列的级联反应。CRP蛋白也会与吞噬细胞的表面FcγRI和FcγRII结合，从而启动吞噬细胞的吞噬反应。

CRP主要在肝内产生，IL-6是肝实质细胞产生CRP蛋白的主要介导体，此外IL-1和糖皮质激素也是CRP蛋白产生重要的诱导物。

检测原理：

本试剂盒采用双抗体夹心ELISA法检测样本中CRP的浓度。CRP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CRP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。当加入与HRP偶连的抗人CRP抗体后，抗人CRP抗体与CRP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。最后加入显色剂，若样本中存在CRP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，CRP浓度与OD₄₅₀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CRP浓度。

人CRP定量分析酶联免疫检测试剂盒组成：

| 组分 | 规格（96T/48T） |
|-------------|-------------|
| 人CRP预包被板 | 12条/6条 |
| 标准品稀释液 | 10ml/5ml |
| 人CRP标准品 | 8支/4支（冻干） |
| HRP连接的抗体结合物 | 10ml/5ml |
| 浓缩洗涤液 20× | 30ml/15ml |
| TMB底物 | 10ml/5ml |
| 终止液 | 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。



4. 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。

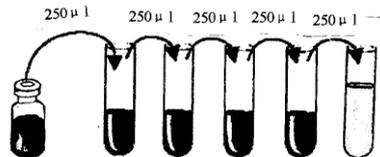
注：人血清或血浆样本请用标准品稀释液做倍比稀释后再检测。

注意事项：

1. 试剂盒请保存在2~8℃。
2. 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，剩余部分请丢弃。
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 CRP 终浓度达到 100ng/ml，室温反应，请严格控制在 25~28℃，静置 10~15 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 100ng/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300u1，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(100u1/孔)加入相应孔中,用封板胶纸封住反应孔,室温(25~28℃)孵育30分钟。如果是血清血浆样本,不同样本稀释比例不一样,一般范围在100~1000倍,如无明确范围,建议从200倍稀释,如果样本浓度过高,超过检测范围,请加大稀释倍数后重新稀释检测。
4. 洗板3次,且最后一次置厚吸水纸上拍干。
5. 加入HRP连接抗体工作液(100u1/孔)。用封板胶纸封住反应孔,室温(25~28℃)孵育30分钟。
6. 洗板3次,且最后一次置厚吸水纸上拍干。
7. 加入显色剂TMB100u1/孔,避光室温(25~28℃)孵育20分钟。
8. 加入终止液50u1/孔,混匀后即刻测量OD450值。

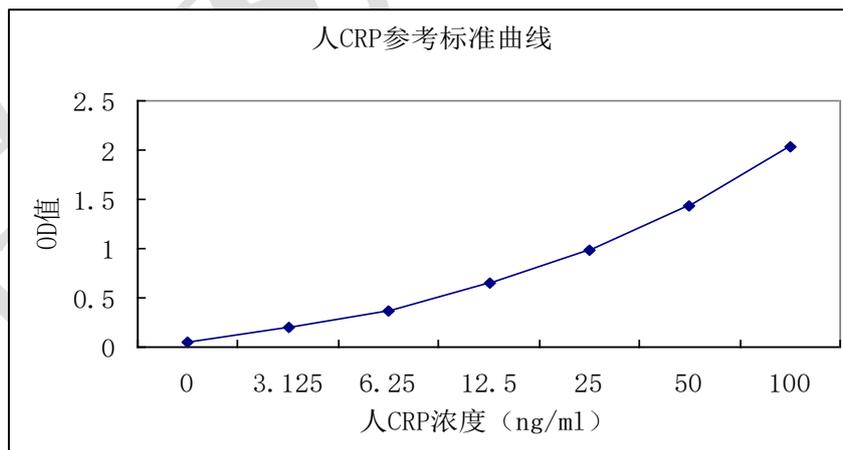
结果判断:

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,应当适当稀释后重测,计算浓度时应乘以稀释倍数。

典型数值和参考曲线

| 浓度ng/ml | 典型OD值1 | 典型OD值2 | OD平均值 |
|---------|--------|--------|--------|
| 0 | 0.0467 | 0.0573 | 0.052 |
| 3.125 | 0.2008 | 0.2224 | 0.2116 |
| 6.25 | 0.3745 | 0.4207 | 0.3976 |
| 12.5 | 0.6529 | 0.7103 | 0.6816 |
| 25 | 0.9832 | 1.0852 | 1.0342 |
| 50 | 1.4261 | 1.4523 | 1.4392 |
| 100 | 2.0301 | 2.2481 | 2.1391 |

人CRP参考标准曲线



注意: 本图仅供参考,应以同次试验标准品所绘标准曲线计算标本含量。

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1.4ng/ml。
2. 重复性: 板内,板间变异系数均<10%。



参考文献:

1. Johnson HL et al; Applications of acute phase reactants in infectious diseases J. Microbiol. Immunol. Infect. 1999, 32: 73
2. Helgeson N et al; C - Reactive Protein : Laboratory Medicine, Vol. 2 (Race G. J., Ed.),Harper & Row, Hagerstown, chapter 29 (1973).
3. Gewurz H et al; C-Reactive Protein and the Acute Phase Response. Adv in Int Med, 1982,27: 345
4. Frank, R. and R. Hargreaves (2003) Nat. Rev. Drug Disc. 2:566.

上海传秋生物科技有限公司



ELISA Kit for the Quantitative Analysis of Human CRP

The human CRP ELISA (enzyme-linked immunosorbent assay) kit is used for detection of human CRP 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

C-Reactive Protein (CRP) is the prototypical acute phase protein in humans and is an important mediator of immune host defense (1, 2) of the pentraxin family (4-6).. Human CRP precursor is a 224 amino acids protein. The mature human CRP protein has 206 amino acids that are noncovalently linked to form the homo pentameric ring structure .

Serum concentration of CRP increases significantly in cases of both infectious and noninfectious inflammation, of tissue damage and necrosis and in the presence of malignant tumors. In response to infection, inflammation or tissue damage, the level of CRP in human serum can increase 1,000 fold within 24~48 hours.

CRP exhibits Ca²⁺ dependent binding to ligands. Phosphocholine (PCh), a constituent of many bacterial and fungal walls, is a principal ligand of CRP. CRP also binds to the membrane of injured cells, membrane and nuclear components of necrotic and apoptotic cells. Upon binding with the ligands, CRP is recognized by C1q and initiates the activation of complement cascade. Ligand bound CRP also binds to Fcγ RI and Fcγ RIa on phagocytes and activates phagocytotic responses. CRP produced exclusively in the liver. Interleukin-6 is the mediator for the synthesis by the hepatocytes . IL-6, IL-1 and glucocorticoids are the major inducer of the CRP gene.

Principles of the Test

The kits is a solid sandwich enzyme-linked immunosorbent assay for detection of human CRP. An anti-human CRP monoclonal antibody has been absorbed onto the wells of the microtiter strips provided. Samples including specimens or standards were pipetted into wells. The human CRP in specimens or standards would be captured by the coated antibody and the free others were removed by washing. The human CRP HRP-conjugated antibody were added and binds to human CRP captured by the first antibody, which formed a sandwich. 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 CRP in the original specimen.

Materials provided with the kits:

| | |
|---------------------------------|--------------------|
| reagent | 96/48Test Kit |
| Human CRP Antibody-Coated Wells | 12 strips/6 strips |
| Standard Diluent | 10 ml/5ml |
| Human CRP Standard | 8/4vial(s) |
| HRP coupled Antibody | 10ml/5ml |
| Wash Buffer Concentrate 20x | 30ml/15ml |
| TMB | 10ml/5 ml |
| Stop Solution | 5ml/3 ml |
| Plate Covers | 3/2 |
| Complete Instruction Manual | 1 |

Specimen Collection

1. Collecting specimen as following:

A. The particulate of the cell culture supernatants should be removed before use.



- B. Serum was obtained from clot at room temperature.
- C. Please collect plasma with EDTA.
- D. Assay immediately or store samples at -20°C . Avoid free-thaw cycles.

- 2. Antiseptic and anticoagulant should not appear in Serum samples.
- 3. 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 diluted as doubling dilution before use.

Precautions for use:

- 1. Please storage the Kit at $2\sim 8^{\circ}\text{C}$.
- 2. Washing buffer concentrate may have crystal in low temperature, and you can melt its in water-bath before use.
- 3. Please discard the dissolved standard after 3 days for use.
- 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 $25\sim 28^{\circ}\text{C}$.
- 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. 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.



- 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.
- Add 100ul of standard or sample. cover with the Plate Covers provided. Incubate for 30 minutes at room temperature. If is plasma serum samples, different sample dilution ratio is different, generally in the range of 100 ~ 1000 times, if there is no definite scope, advice from 200 times dilution, if the sample concentration is too high, more than test scope, please increase after diluted times dilution test again.
- Three times wash process were repeated.
- Add 100ul of HRP- antibody. Cover with the Plate Covers provided. Incubate for 30 minutes at room temperature.
- Three times wash process were repeated.
- Add 100ul of TMB, Lucifugal incubation for 20 minutes at room temperature.
- Add 50ul of stop solution to each well, determine the optical density of each well within 10 minutes.

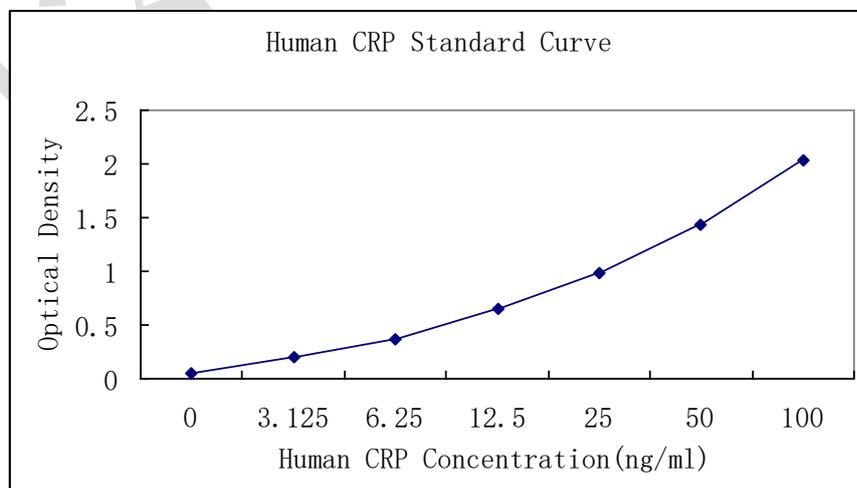
Calculation of Results

- Duplicates should be within 20 per cent of the mean. Average absorbance values for each set of duplicate samples were used as detection results.
- The blank absorbance values of subtract should be deducted.
- 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.
- 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 (ng/ml) | Typical data 1 | Typical data 2 | Average |
|-----------------------|----------------|----------------|---------|
| 0 | 0.0467 | 0.0573 | 0.052 |
| 3.125 | 0.2008 | 0.2224 | 0.2116 |
| 6.25 | 0.3745 | 0.4207 | 0.3976 |
| 12.5 | 0.6529 | 0.7103 | 0.6816 |
| 25 | 0.9832 | 1.0852 | 1.0342 |
| 50 | 1.4261 | 1.4523 | 1.4392 |
| 100 | 2.0301 | 2.2481 | 2.1391 |

Human CRP Standard Curve





Sensitivity, Specificity, Repeatability

Sensitivity: repeated assays were evaluated and the minimum detectable dose was 1.4ng/ml.

Repeatability: The coefficient of variation between wells or plates is less than 10 percent.

REFERENCES:

1. Johnson HL et al; Applications of acute phase reactants in infectious diseases J. Microbiol. Immunol. Infect. 1999, 32: 73
2. Helgeson N et al; C - Reactive Protein : Laboratory Medicine, Vol. 2 (Race G. J., Ed.),Harper & Row, Hagerstown, chapter 29 (1973).
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