



Human CRP ELISA Kit

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Hinweis/Note:

Der Packungsbeileger dient nur als erste Information.
Der relevante Packungsbeileger liegt der Ware bei.

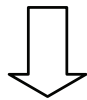
The datasheet is only a first information.
The relevant datasheet is included with the product.

For any questions regarding troubleshooting or performing the assay, please contact our support team at support@assaypro.com.

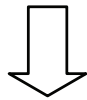
Thank you for choosing Assaypro.

Assay Summary

Add 50 μ l of Standard/ Sample per well.
Incubate 2 hours.



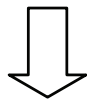
Wash, then add 50 μ l of
Biotinylated Antibody per well.
Incubate 30 minutes.



Wash, then add 50 μ l of
SP Conjugate per well.
Incubate 30 minutes.



Wash, then add 50 μ l of
Chromogen Substrate per well.
Incubate 10 minutes.



Add 50 μ l of Stop Solution per well.
Read at 450 nm immediately.

AssayMax Human C-Reactive Protein (CRP) ELISA Kit

Catalog No. EC1001-1
Sample Insert/Reference Only

Introduction

C-Reactive Protein (CRP) is a liver protein composed of five identical non-glycosylated subunits, with a total molecular weight of 105 kDa. CRP has a variety of powerful effects related to immunology, inflammation, and coagulation. As a marker of low-level inflammation, CRP appears to predict future cardiovascular disease events among apparently healthy individuals. High plasma concentration of CRP was associated with increased risk of stroke, myocardial infarction, and peripheral vascular disease (1-3). CRP has also been associated with increased risks of fatal coronary events among high-risk male smokers and incident coronary disease among the elderly (4, 5). Studies have established the prognostic usefulness of CRP in the setting of angina (6). Originally used as a marker of acute inflammation, CRP has become a leading candidate as the measure of choice for estimating the inflammatory component of cardiovascular disease risk.

Principle of the Assay

The AssayMax Human C-Reactive Protein ELISA (Enzyme-Linked Immunosorbent Assay) kit is designed for detection of human CRP in plasma, serum, milk, urine, and cell culture supernatant samples. This assay employs a quantitative sandwich enzyme immunoassay technique that measures CRP in less than 4 hours. A murine antibody specific for CRP has been pre-coated onto a 96-well microplate with removable strips. CRP in standards and samples is sandwiched by the immobilized antibody and biotinylated polyclonal antibody specific for CRP, which is recognized by a streptavidin-peroxidase conjugate. All unbound material is then washed away and a peroxidase enzyme substrate is added. The color development is stopped and the intensity of the color is measured.

Caution and Warning

- **Prepare all reagents (working diluent buffer, wash buffer, standards, biotinylated antibody, and SP conjugate) as instructed, prior to running the assay.**

- **Prepare all samples prior to running the assay. The dilution factors for the samples are suggested in this protocol. However, the user should determine the optimal dilution factor.**
- **Spin down the SP conjugate vial and the biotinylated antibody vial before opening and using contents.**
- This kit is for research use only.
- The kit should not be used beyond the expiration date.
- The Stop Solution is an acidic solution.

Reagents

- **Human CRP Microplate:** A 96-well polystyrene microplate (12 strips of 8 wells) coated with a murine antibody against CRP.
- **Sealing Tapes:** Each kit contains 3 precut, pressure sensitive sealing tapes that can be cut to fit the format of the individual assay.
- **Human CRP Standard:** Human CRP in a buffered protein base (16 ng, lyophilized).
- **Biotinylated Human CRP Antibody (50x):** A 50-fold biotinylated polyclonal antibody against CRP (140 μ l).
- **EIA Diluent Concentrate (10x):** A 10-fold concentrated buffered protein base (30 ml).
- **Wash Buffer Concentrate (20x):** A 20-fold concentrated buffered surfactant (30 ml, 2 bottles).
- **Streptavidin-Peroxidase Conjugate (SP Conjugate):** A 100-fold concentrate (80 μ l).
- **Chromogen Substrate:** A ready-to-use stabilized peroxidase chromogen substrate tetramethylbenzidine (8 ml).
- **Stop Solution:** A 0.5 N hydrochloric acid to stop the chromogen substrate reaction (12 ml).

Storage Condition

- Upon arrival, immediately store components of the kit at recommended temperatures up to the expiration date.
- Store SP Conjugate and Biotinylated Antibody at -20°C.
- Store Microplate, Diluent Concentrate (10x), Wash Buffer, Stop Solution, and Chromogen Substrate at 2-8°C.
- Unused microplate wells may be returned to the foil pouch with the desiccant packs and resealed. May be stored for up to 30 days in a vacuum desiccator.
- Diluent (1x) may be stored for up to 30 days at 2-8°C.
- Store Standard at 2-8°C before reconstituting with diluent and at -20°C after reconstituting with diluent.

Other Supplies Required

- Microplate reader capable of measuring absorbance at 450 nm.
- Pipettes (1-20 μ l, 20-200 μ l, 200-1000 μ l and multiple channel pipette).
- Deionized or distilled reagent grade water.

Sample Collection and Storage

- **Plasma:** Collect plasma using one-tenth volume of 0.1 M sodium citrate as an anticoagulant. Centrifuge samples at 3000 x *g* for 10 minutes. Dilute samples 1:4000 with EIA Diluent or within the range of 1000x to 8000x, and assay. The undiluted samples can be stored at -20°C or below for up to 3 months. Avoid repeated freeze-thaw cycles (EDTA or Heparin can also be used as an anticoagulant).
- **Serum:** Samples should be collected into a serum separator tube. After clot formation, centrifuge samples at 3000 x *g* for 10 minutes and remove serum. Dilute samples 1:4000 into EIA Diluent or within the range of 1000x to 8000x, and assay. The undiluted samples can be stored at -20°C or below for up to 3 months. Avoid repeated freeze-thaw cycles.
- **Milk:** Collect milk using sample tube. Centrifuge samples at 800 x *g* for 10 minutes. Dilute milk 1:30 into EIA Diluent or within the range of 1x to 100x, and assay. The undiluted samples can be stored at -20°C or below for up to 3 months. Avoid repeated freeze-thaw cycles.
- **Urine:** Collect urine using sample tube. Centrifuge samples at 800 x *g* for 10 minutes and assay. Samples can be stored at -20°C or below for up to 3 months. Avoid repeated freeze-thaw cycles.
- **Cell Culture Supernatants:** Centrifuge cell culture media at 3000 x *g* for 10 minutes to remove debris. Collect supernatants and assay. Samples can be stored at -20°C or below. Avoid repeated freeze-thaw cycles.

Reagent Preparation

- Freshly dilute all reagents and bring all reagents to room temperature before use.
- **EIA Diluent Concentrate (10x):** If crystals have formed in the concentrate, mix gently until the crystals have completely dissolved. Dilute the EIA Diluent Concentrate 1:10 with reagent grade water. Store for up to 30 days at 2-8°C.
- **Human CRP Standard:** Reconstitute the 16 ng of Human CRP Standard with 1 ml of EIA Diluent to generate a 16 ng/ml stock solution. Allow the standard to sit for 10 minutes with gentle agitation prior to making dilutions. Prepare duplicate or triplicate standard points by serially diluting the standard stock solution (16 ng/ml) 1:2 with equal volume of EIA Diluent to produce 8, 4, 2, 1, 0.5, and 0.25 ng/ml solutions. EIA

Diluent serves as the zero standard (0 ng/ml). Any remaining solution should be frozen at -20°C and used within 30 days.

Standard Point	Dilution	[CRP] (ng/ml)
P1	Standard (16 ng/ml)	16.0
P2	1 part P1 + 1 part EIA Diluent	8.00
P3	1 part P2 + 1 part EIA Diluent	4.00
P4	1 part P3 + 1 part EIA Diluent	2.00
P5	1 part P4 + 1 part EIA Diluent	1.00
P6	1 part P5 + 1 part EIA Diluent	0.50
P7	1 part P6 + 1 part EIA Diluent	0.25
P8	EIA Diluent	0.00

- **Biotinylated Human CRP Antibody (50x):** Spin down the antibody briefly and dilute the desired amount of the antibody 1:50 with EIA Diluent. Any remaining solution should be frozen at -20°C.
- **Wash Buffer Concentrate (20x):** If crystals have formed in the concentrate, mix gently until the crystals have completely dissolved. Dilute the Wash Buffer Concentrate 1:20 with reagent grade water.
- **SP Conjugate (100x):** Spin down the SP Conjugate briefly and dilute the desired amount of the conjugate 1:100 with EIA Diluent. Any remaining solution should be frozen at -20°C.

Assay Procedure

- Prepare all reagents, working standards, and samples as instructed. Bring all reagents to room temperature before use. The assay is performed at room temperature (20-25°C).
- Remove excess microplate strips from the plate frame and return them immediately to the foil pouch with desiccants inside. Reseal the pouch securely to minimize exposure to water vapor and store in a vacuum desiccator.
- Add 50 µl of Human CRP Standard or sample per well. Cover wells with a sealing tape and incubate for 2 hours. Start the timer after the last addition.
- Wash five times with 200 µl of Wash Buffer manually. Invert the plate each time and decant the contents; hit 4-5 times on absorbent material to completely remove the liquid. If using a machine, wash six times with 300 µl of Wash Buffer and then invert the plate, decanting the contents; hit 4-5 times on absorbent material to completely remove the liquid.
- Add 50 µl of Biotinylated Human CRP Antibody to each well and incubate for 30 minutes.
- Wash the microplate as described above.

- Add 50 μ l of Streptavidin-Peroxidase Conjugate per well and incubate for 30 minutes. Turn on the microplate reader and set up the program in advance.
- Wash the microplate as described above.
- Add 50 μ l of Chromogen Substrate per well and incubate for about 10 minutes or till the optimal color density develops. Gently tap the plate to ensure thorough mixing and break the bubbles in the well with pipette tip.
- Add 50 μ l of Stop Solution to each well. The color will change from blue to yellow.
- Read the absorbance on a microplate reader at a wavelength of 450 nm **immediately**. If wavelength correction is available, subtract readings at 570 nm from those at 450 nm to correct optical imperfections. Otherwise, read the plate at 450 nm only. Please note that some unstable black particles may be generated at high concentration points after stopping the reaction for about 10 minutes, which will reduce the readings.

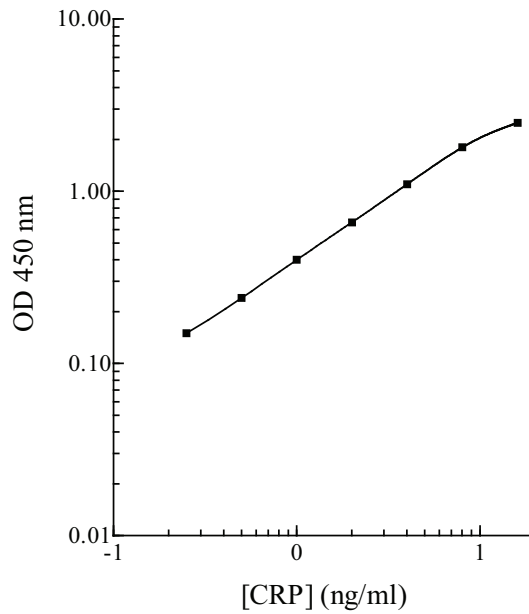
Data Analysis

- Calculate the mean value of the duplicate or triplicate readings for each standard and sample.
- To generate a standard curve, plot the graph using the standard concentrations on the x-axis and the corresponding mean 450 nm absorbance on the y-axis. The best-fit line can be determined by regression analysis using log-log or four-parameter logistic curve-fit.
- Determine the unknown sample concentration from the Standard Curve and multiply the value by the dilution factor.

Standard Curve

- The curve is provided for illustration only. A standard curve should be generated each time the assay is performed.

CRP Standard Curve



Performance Characteristics

- The minimum detectable dose of CRP is typically ~ 0.25 ng/ml.
- Intra-assay and inter-assay coefficients of variation were 5.0 % and 7.1% respectively.

Cross-Reactivity

Species	% Cross Reactivity
Beagle	None
Bovine	None
Monkey	None
Mouse	None
Rat	None
Rabbit	None
Swine	<10%
Human	100%

Linearity

Sample Dilution	Average Percentage of Expected Value	
	Plasma	Serum
1:2000	92%	93%
1:4000	99%	100%
1:8000	104%	105%

Recovery

Standard Added Value	0.5 – 8 ng/ml
Recovery %	88 – 110%
Average Recovery %	98.5%

References

- (1) Ridker, P.M. *et al.* (1997) *N. Engl. J. Med.* 336: 973
- (2) Ridker, P.M. *et al.* (1998) *Circulation* 98: 731
- (3) Ridker, P.M. *et al.* (1998) *Circulation* 97: 425
- (4) Kuller, L.H. *et al.* (1996) *Am. J. Epidemiol.* 144:537
- (5) Tracy, R.P. *et al.* (1997) *Arterioscler. Thromb. Vasc. Biol.* 17:1121
- (6) Liuzzo, G. *et al.* (1994) *N. Engl. J. Med.* 331:417

Version 7.2

Related Products:

- ERC1001-1 AssayMax Rat C-Reactive Protein ELISA Kit (Plasma, Serum, Urine, and Cell Culture samples)
- EMC1001-1 AssayMax Mouse C-Reactive Protein ELISA Kit (Plasma, Serum, Urine, and Cell Culture samples)