

Coenzyme Q10 (COQ10) ELISA Kit

Catalog No: abx159767

Size: 96T

Range: 3.12 ng/ml - 50 ng/ml

Sensitivity: < 1.56 ng/ml

Storage: Store the 96-well plate, Standards, and Detection Reagent(s) at -20°C, and the rest of the kit components at 4°C.

Application: The quantitative detection of COQ10 in serum, plasma and tissue homogenates.

Principle of the Assay: This kit is based on competitive enzyme-linked immuno-sorbent assay technology. An antibody is pre-coated onto a 96-well plate. Standards, test samples, and a HRP-conjugated COQ10 are added to the wells and incubated. A competitive inhibition reaction takes place between the HRP-labelled COQ10 and the unlabelled-COQ10, with the pre-coated antibody. Unbound conjugates are removed using wash buffer. TMB substrate is used to quantify the HRP enzymatic reaction. After TMB substrate is added, only wells that contain sufficient COQ10 will produce a blue coloured product, which then changes to yellow after adding the acidic stop solution. The intensity of the color yellow is inversely proportional to the COQ10 amount bound on the plate. The OD is measured spectrophotometrically at 450 nm in a microplate reader, from which the concentration of COQ10 can be calculated.

Kit Components

- Pre-coated 96-Well Microplate: 12 x 8
- Standard: (10X) 200 µl
- Wash Buffer: (25X) 20 ml
- Sample Diluent Buffer: 2 x 20 ml
- Detection Reagent: (100X) 60 µl
- Detection Reagent Diluent: 10 ml
- TMB Substrate: 10 ml
- Stop Solution: 10 ml
- Plate Sealer: 3
- Hermetic Bag: 1

Materials Required But Not Provided

- 37°C incubator
- Multi and single channel pipettes and sterile pipette tips
- Squirt bottle or automated microplate washer
- 1.5 ml tubes
- Distilled water
- Absorbent filter papers
- 100 ml and 1 liter graduated cylinders
- Microplate reader (wavelength: 450 nm, correction wavelength: 540 or 570 nm)
- ELISA Shaker

Instructions for Use

Version: 2.0.1

Revision date: 25 May 2021



Protocol

A. Sample Preparation

Analyse immediately or store samples at 2-8°C (within 24 hrs). For long term storage, aliquot and store at -20°C or -80°C. Avoid multiple freeze-thaw cycles.

- **Serum:** Samples should be collected into a serum separator tube. Coagulate the serum by leaving the tube undisturbed in a vertical position overnight at 4°C or at room temperature for up to 1 hr. Centrifuge at approximately 1000 × g for 20 mins. If precipitate appears, centrifuge again. Assay immediately or aliquot and store at -20°C or -80°C.
- **Plasma:** Collect plasma using EDTA as an anticoagulant. Centrifuge for 15 mins at 1000 × g, within 30 mins of collection. If precipitate appears, centrifuge again. Avoid hemolytic samples.
- **Tissue Homogenates:** The preparation of tissue homogenates will vary depending upon tissue type – this is just an example. Rinse tissues with ice-cold PBS to remove the excess of blood. Weigh before homogenization. Finely mince tissues and homogenize with a tissue homogenizer on ice in PBS and sonicate the cell suspension. Centrifuge the homogenates at 10000 × g for 5 mins and collect the supernatant.

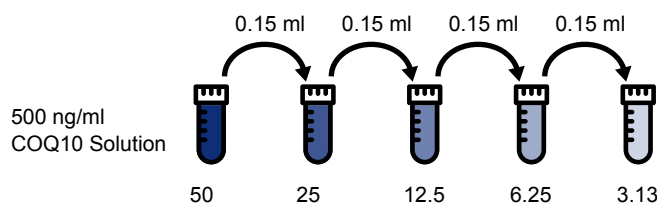
Notes:

- Samples must be diluted so that the expected concentration falls within the kit's range. **Serum/Plasma samples should be diluted 100-fold.**
- Always use non-pyrogenic, endotoxin-free tubes for blood collection.
- Fresh samples, or recently obtained samples, are recommended to prevent protein degradation and denaturation that may lead to erroneous results.
- NaN₃ cannot be used as a test sample preservative, since it inhibits HRP.
- If possible, prepare solid samples using sonication and/or homogenization, as lysis buffers may (on occasion) interfere with the kit's performance.
- If a sample is not indicated in the manual's applications, a preliminary experiment to determine the suitability of the kit will be required.

B. Reagent Preparation

Standard: Centrifuge the Standard tube before use. Dilute the Standard 10-fold (1/10) with Sample Diluent to give the highest standard, 50 ng/ml - i.e. add 270 µl Sample Diluent Buffer to 30 µl of Standard. Mix thoroughly. Label tubes in preparation for the serial dilutions - see the diagram below for reference. Aliquot 0.15 ml of the Standard Diluent Buffer into each tube (apart from the highest standard tube). Add 0.5 ml of the highest standard solution into the 1st tube and mix thoroughly. Transfer 0.15 ml from the 1st to 2nd tube, mix thoroughly, and so on.

Note: Do not vortex the standard during reconstitution, as this will destabilize the protein. Once the standard has been reconstituted, it should be used within 15 mins. It is not recommended to reuse the reconstituted standard.



Wash Buffer: Dilute the concentrated Wash Buffer 25-fold (1/25) with distilled water (i.e. add 20 ml of concentrated wash buffer into 480 ml of distilled water). If crystals have formed in the concentrated Wash Buffer, warm to room temperature and mix gently until the crystals have completely dissolved.

Detection Reagent Working Solution Preparation: Calculate the total volume of working solution required. Dilute the Detection Reagent 100-fold with Detection Reagent Diluent, and mix thoroughly. Pipette with a slow, smooth action to reduce volume errors.

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C. Assay Protocol

Prepare all standards, samples and reagents as directed above. Equilibrate the kit components and samples to room temperature prior to use. It is recommended to measure in duplicate, and to plot a standard curve for each test.

1. Set standard, test sample and control (zero) wells on the pre-coated plate respectively, and record their positions. *Add the solution to the bottom of each well without touching the side walls. Pipette the standards and samples up and down to mix before adding to the wells. Avoid foaming or bubbles.*
2. Aliquot 50 µl of the diluted standards into the standard wells.
3. Aliquot 50 µl of Standard Diluent buffer into the control (zero) well.
4. Aliquot 50 µl of appropriately diluted sample into the test sample wells. Gently tap the plate to mix, or use a microplate shaker.
5. Immediately aliquot 50 µl of Detection Reagent working solution to each well (except the control well). Gently tap the plate to mix, or use a microplate shaker. Cover the plate with a plate sealer and incubate for 40 mins at 37°C.
6. Remove the cover and discard the solution. Wash the plate 5 times with 1X Wash Buffer. *Fill each well completely with Wash buffer (200 µl) using a multi-channel Pipette or autowasher (1-2 mins soaking period is recommended). Complete removal of liquid at each step is essential for good performance. After the final wash, remove any remaining Wash Buffer by aspirating or decanting. Invert the plate and blot it against clean absorbent paper towels.*
7. Aliquot 90 µl of TMB Substrate into each well. Cover the plate with the plate sealer. Gently tap the plate to mix thoroughly. Incubate at 37°C for 10-20 minutes. The incubation time is for reference only, the optimal time should be determined by end user. Avoid exposure to light.
8. Aliquot 50 µl of Stop Solution into each well. It is important that the Stop Solution is mixed quickly and uniformly throughout the microplate to inactivate the enzyme completely.
9. Ensure that there are no fingerprints or water on the bottom of the plate, and that the fluid in the wells is free of bubbles. Measure the OD at 450 nm immediately.

This assay is competitive, therefore there is an inverse correlation between the concentration of the sample and the OD measured. Create a graph with the log of the standard concentration (Y) and OD measured (X). Apply a best fit trendline through the standard points. Use this graph to calculate sample concentrations based on their OD values. If the samples have been diluted, the concentration read from the standard curve must be multiplied by the dilution factor.

Precautions:

- Before using the kit, centrifuge the tubes to bring down the contents trapped in the lid.
- Do not leave the wells uncovered for extended periods between incubations. The addition of reagents for each step should not exceed 10 mins.
- Ensure that the plate is properly sealed or covered during the incubation steps, and that the time and temperature are controlled.
- Do not reuse pipette tips and tubes.
- Do not use expired components, or components from a different kit.
- The TMB substrate should be used under sterile conditions, and light exposure should be minimised. Unused substrate should be colorless, or a very light yellow in appearance. Do not discard any residual solution back into the vial.
- Please note that this kit is optimised for detection of native samples, rather than recombinant proteins or synthetic chemicals. We are unable to guarantee detection of recombinant proteins, as they may have different sequences or tertiary structures to the native protein.

Precision:

Intra-assay Precision (Precision within an assay): 3 samples with low, medium and high levels of COQ10 were tested 20 times on one plate, respectively.

Inter-assay Precision (Precision between assays): 3 samples with low, medium and high levels of COQ10 were tested on 3 different plates, 8 replicates in each plate.

$$CV (\%) = (\text{Standard Deviation} / \text{Mean}) \times 100$$

Intra-Assay: CV ≤ 8%

Inter-Assay: CV ≤ 10%

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D. Typical Data and Standard Curve

Typical Standard Curve Data is provided for demonstration purposes only. A new standard curve must be generated for each assay performed.

