

Datasheet for ABIN5067563
NADP+/NADPH Assay Kit

3 Images

[Go to Product page](#)

Overview

Quantity:	100 tests
Application:	Biochemical Assay (BCA)

Product Details

Purpose:	NADP+ /NADPH Assay Kit is a convenient quantitative tool that measures NADP+ and NADPH within biological samples. The assay is based on an enzymatic cycling reaction in which NADP+ is reduced to NADPH. NADPH reacts with a colorimetric probe that produces a colored product which can be measured at 450 nm. The intensity of the product color is proportional to the NADP+ and NADPH within a sample. A simple acid or base treatment will differentiate NADPH from NADP+ within a sample. Samples and standards are incubated for 1-4 hours and then read with a standard 96-well colorimetric plate reader . Samples are compared to a known concentration of NADP+ standard within the 96-well microtiter plate format. . NADP+/NADPH Cycling Assay Principle. 2
Sample Type:	Cell Samples, Tissue Lysate
Analytical Method:	Quantitative
Characteristics:	NADP+/NADPH Assay Kit is a simple colorimetric assay that can measure both NADP+ and NADPH present in biological samples such as cell lysates or tissue extracts in a 96-well microtiter plate format. The kit is specific for NADP+, NADPH, and their ratio. The kit will not detect NAD or NADH. Each kit provides sufficient reagents to perform up to 100 assays, including blanks, NADP+ standards and unknown samples. The total NADP+/NADPH concentrations of unknown samples are determined by comparison with a known NADP+ standard. Determination of both NADP+ and NADPH requires two separate samples for quantification. NADP+ and NADPH do not need to be purified from samples, but rather can be

Product Details

extracted individually with a simple acid or base treatment prior to performing the assay. The kit has a detection sensitivity limit of approximately 4 nM NADP+.

Components:

1. Colorimetric Probe : One 1.0 mL amber tube
2. NADP Cycling Substrate : One 50 µL tube
3. Assay Buffer : One 25 mL bottle
4. Extraction Buffer (10X) : One 10 mL bottle

Box 2 (shipped on blue ice packs)

Target Details

Background:

Nicotinamide adenine dinucleotide phosphate (NADP+) is an enzymatic cofactor involved in metabolic redox and cell signaling reactions. Its main function in animal metabolism is to shift electrons from one redox reaction to another. During these reactions, the coenzyme cycles between the electron donating reduced form (NADPH) and the electron accepting oxidized form (NADP+). The major source of NADPH produced in animal cells is the oxidative branch of the pentose phosphate pathway (PPP). NADPH is involved with macromolecule biosynthesis by providing reducing power. These characteristics have made NADPH an important molecule in cancer cell proliferation and metabolism. NADPH is also involved in the accumulation of Reactive Oxygen Species (ROS) and protecting against its toxicity. It is also involved in anabolic pathways, such as fatty acid elongation and lipid and cholesterol synthesis. Understanding the metabolism of these cofactors has become important to developing new therapeutic methods against pathological disease states.

Application Details

Comment:

- Detects NADP+, NADPH, or total NADP+/NADPH
- Compatible with cell or tissue lysates
- NADP+ standard included

Reagent Preparation:

- 1X Extraction Buffer: Dilute the stock 10X Extraction Buffer 1:10 with deionized water for a 1X solution. Stir or vortex to homogeneity.
- NADP Cycling Reagent: Prepare an NADP Cycling Reagent for the number of assays being tested and just before use. Prepare by diluting the NADP Cycling Substrate 1:100, NADP Cycling Enzyme 1:400, and Colorimetric Probe 1:5 in 1X Assay Buffer. (eg. For 100 assays, combine 50 µL NADP Cycling Substrate, 12.5 µL NADP Cycling Enzyme, 1000 µL Colorimetric Probe to 3.938 mL of 1X Assay Buffer for a 5 mL total solution). Use the NADP Cycling Reagent the same day as preparation. Preparation of Samples These preparation protocols are intended as a guide for preparing unknown samples. The user may need to adjust the sample treatment accordingly. It is highly recommended that all samples should be assayed

immediately upon preparation or stored for up to 1 month at -80 °C. A trial assay with a representative test sample should be performed to determine the sample compatibility with the dynamic range of the standard curve. High levels of interfering substances may cause variations in results. Samples may be diluted in deionized water as necessary before testing. Run proper controls and account for any sample dilutions. Always run a standard curve with samples.

- Tissue homogenates: Sonicate or homogenize 100 mg tissue sample in 0.5 mL cold 1X Extraction Buffer. Centrifuge at 14,000 rpm for 5 minutes at 4 °C to remove insoluble material. Filter the solution with a 10 kDa spin filter to deproteinate the sample. Collect flow through. Perform dilutions in cold deionized water. Sample may be tested immediately for total NADP⁺/NADPH quantification or extracted with acid or base to separate the cofactors. Store unused samples at -80 °C for up to 1 month.
 - Cell lysates: Culture cells until confluent and harvest. Centrifuge and wash cell pellet with 1X PBS. Centrifuge to pellet cells and remove wash. Resuspend cells at 1-5 x 10⁶ cells/mL in 0.5 mL 1X Extraction Buffer. Homogenize or sonicate the cells on ice. Centrifuge at 14,000 rpm for 5 minutes 4 °C to remove debris. Filter the solution with a 10 kDa spin filter to deproteinate the sample. Collect flow through. Perform dilutions in cold deionized water. Sample may be tested immediately for total NADP⁺/NADPH quantification or extracted with acid or base to separate the cofactors. Store unused samples at -80 °C for up to 1 month.
Note: Enzymes in tissue and cell sample lysates may deplete NADPH rapidly and affect results. Samples should be deproteinized before extracting the cofactors or using within the assay. A spin filter with a 10 kDa cutoff is recommended for efficient and clean separation.
- NADPH Extraction Procedure:** To measure NADPH and destroy NADP⁺, add 25 µL of sample to a microcentrifuge tube. Add 5 µL of 0.1 N NaOH and mix thoroughly. Incubate the tube at 80 °C for 60 minutes and protected from light. Centrifuge the tube to pool all sample solution. Add 20 µL of 1X Assay Buffer to shift the pH of the sample back to neutral. Vortex to mix and centrifuge to pool sample. Keep sample on ice until assaying.
- NADP⁺ Extraction Procedure:** To measure NADP⁺ and destroy NADPH, add 25 µL of sample to a microcentrifuge tube. Add 5 µL of 0.1 N HCl and mix thoroughly. Incubate the tube at 80 °C for 60 minutes and protected from light. Centrifuge the tube to pool all sample solution. Add 20 µL of 1X Assay Buffer to shift the pH of the sample back to neutral. Vortex to mix and centrifuge to pool sample. Keep sample on ice until assaying.
- Notes:**
- If testing both total NADP⁺/NADPH and individual cofactors, dilute the total NADP⁺/NADPH samples 1:2 with Assay buffer to maintain sample dilution consistency.
 - Avoid samples containing SH groups like DTT, β-mercaptoethanol, or reduced glutathione.
 - Samples should be close to neutral pH before harvesting. Samples with extremely high or low pH values could fail to yield reliable results.

Assay Procedure:

1. Prepare and mix all reagents thoroughly before use. Each sample, including unknowns and standards, should be assayed in duplicate or triplicate. 5
2. Add 50 µL of each NADP⁺ standard or unknown sample into wells of a 96-well microtiter plate.
3. Add 50 µL of NADP Cycling Reagent to each well. Mix the well contents thoroughly and incubate for 1-4 hours at room temperature protected from light. Note: This assay is

Application Details

continuous (not terminated) and therefore may be measured at multiple time points to follow the reaction kinetics. The assay may be stopped at a desired time point by adding 50 μ L 0.5 N H₂SO₄.

4. Read the plate with a spectrophotometric microplate reader at 450 nm.
5. Calculate the concentration of NADP⁺/NADPH within samples by comparing the sample OD to the standard curve.

Calculation of Results:

1. Calculate the average absorbance values for every standard, control, and sample. Subtract the average zero standard value from itself and all standard and sample values. This is the corrected background absorbance. If sample background control value is high, subtract the sample background control value from the sample reading.
2. Plot the corrected absorbance for the NADP⁺ standards against the final concentration of the standards from Table 1 to determine the best slope (μ M⁻¹). See Figure 2 for an example standard curve.
3. Since all NADP⁺ is converted to NADPH by the Cycling Reagent, use the standard curve to determine the total NADP⁺/NADPH concentration in pmoles within the sample. Determine the total concentration of the samples with the equation obtained from the linear regression analysis of the standard curve. Substitute the corrected absorbance values for each sample. Remember to account for dilution factors. Total NADP⁺/NADPH = Sample corrected absorbance x Sample dilution Slope

Restrictions:

For Research Use only

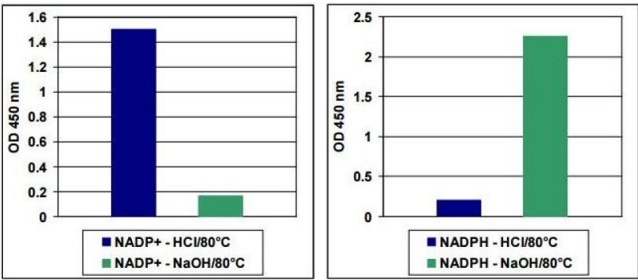
Handling

Storage:

-20 °C/-80 °C

Storage Comment:

Upon receipt, store the NADP Cycling Enzyme and NADP⁺ Standard at -80°C. Store the Colorimetric Probe at -20°C. Store the remaining components at 4°C.



Biochemical Assay

Image 1. NADP+/NADPH Detection. NADP+ and NADPH were both tested at 1 μ M with the extraction procedure. NADP+ or NADPH were incubated for 60 minutes at 80°C with 0.1N HCl or 0.1N NaOH

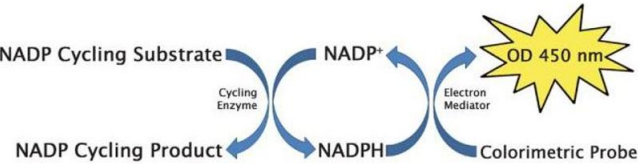
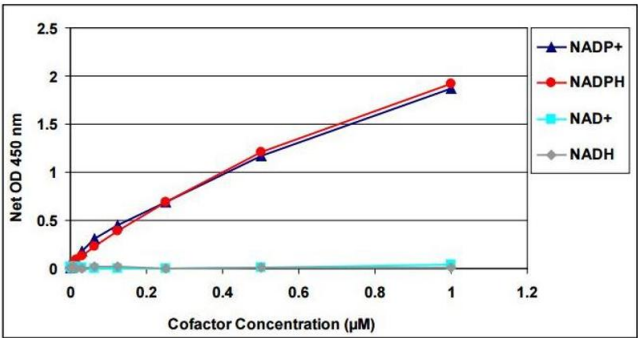


Image 2. NADP+/NADPH Cycling Assay Principle.



Biochemical Assay

Image 3. NADP+ Standard Curve and Specificity of Assay for NADP+ and NADPH. NADP+ NADPH, NAD+ , and NADH, were tested in the NADP+ /NADPH Assay Kit.