PRODUCT INFORMATION

NADPH Cytochrome P450 Reductase (human, recombinant)

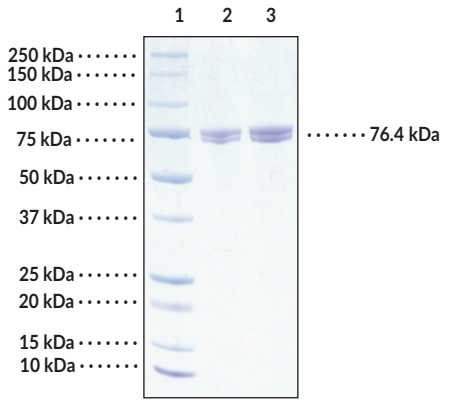
Item No. 33015

Overview and Properties

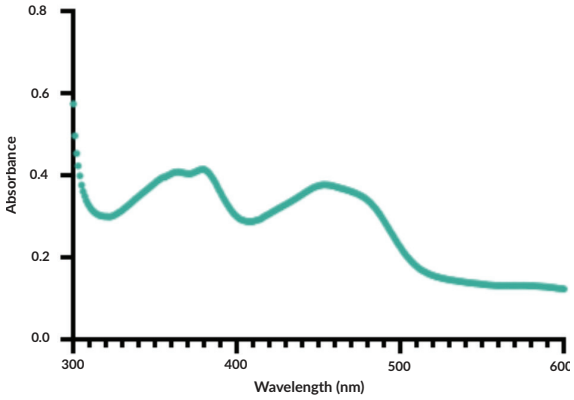
Synonyms:	CPR, CYPOR, NADPH Hemoprotein Reductase, NCPR, P450R, POR
Source:	Active recombinant human C-terminal His-tagged NADPH cytochrome P450 reductase expressed in *E. coli*
Amino Acids:	24-677
Uniprot No.:	P16435
Molecular Weight:	76.4 kDa
Storage:	-80°C (as supplied)
Stability:	≥1 year
Purity:	≥90% estimated by SDS-PAGE
Supplied in:	50 mM potassium phosphate, pH 7.6, with 10% glycerol
Protein Concentration:	***batch specific*** mg/ml
Activity:	***batch specific*** U/ml
Specific Activity:	***batch specific*** U/mg
Unit Definition:	One unit is defined as the amount of enzyme required to reduce 1 nmol of cytochrome *c* per minute at 25°C in 25 mM potassium phosphate, pH 7.6.

Information represents the product specifications. Batch specific analytical results are provided on each certificate of analysis.

Images



Lane 1: MW Markers
Lane 2: NADPH Cytochrome P450 Reductase (human, recombinant) (2 µg)
Lane 3: NADPH Cytochrome P450 Reductase (human, recombinant) (4 µg)



Typical UV-visible absorption spectra of purified NADPH Cytochrome P450 Reductase (human, recombinant).
The presence of FAD loaded domains in NADPH Cytochrome P450 Reductase (human, recombinant) are verified spectrophotometrically by FAD absorption at 463 nm using an extinction coefficient of 0.0136 μM^{-1} cm^{-1}.

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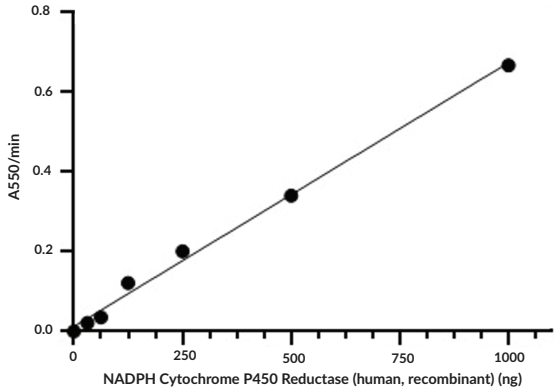

NADPH Cytochrome P450 Reductase (human, recombinant) activity was determined through the reduction of cytochrome *c* from bovine heart (Sigma-Aldrich, Product No. C3131) using β-NADPH (Sigma-Aldrich, Product No. N7505) as the cofactor. The reduction of cytochrome *c* results in the increase in absorbance at 550 nm, thereby allowing activity to be monitored.

Description

NADPH cytochrome P450 reductase (POR) is a flavoprotein and key electron donor to cytochrome P450s (CYPs).[1,2] It is composed of an N-terminal membrane anchor domain and FMN-binding domain, which is linked to a C-terminal FAD-binding domain and NADPH-binding domain and localized to the cytosolic side of the endoplasmic reticulum.[1,3,4] POR transfers electrons from NADPH through FAD and FMN coenzymes into the iron of the prosthetic heme group of CYPs.[1,3] Cortical levels of POR are increased in the APPswe/PSEN1dE9 transgenic mouse model of Alzheimer's disease.[5] Deficiency in *POR* is associated with ambiguous genitalia and the disruption of steroid metabolism in patients with Antley-Bixler syndrome.[6] Cayman's NADPH Cytochrome P450 Reductase (human, recombinant) can be used for enzyme activity assays.

References

1. Laursen, T., Jensen, K., and Møller, B.L. Conformational changes of the NADPH-dependent cytochrome P450 reductase in the course of electron transfer to cytochromes P450. *Biochim. Biophys. Acta.* **1814(1),** 132-138 (2011).
2. Backes, W.L. and Kelley, R.W. Organization of multiple cytochrome P450s with NADPH-cytochrome P450 reductase in membranes. *Pharmacol. Ther.* **98(2),** 221-233 (2003).
3. Jensen, K. and Møller, B.L. Plant NADPH-cytochrome P450 oxidoreductases. *Phytochemistry* **71(2-3),** 132-141 (2010).
4. Barnaba, C., Gentry, K., Sumangala, N., *et al.* The catalytic function of cytochrome P450 is entwined with its membrane-bound nature. *F1000Res.* **6(F1000 Faculty Rev),** 662 (2017).
5. Yao, Y., Huang, J.-Z., Chen, L., *et al. In vivo* and *in vitro* studies on the roles of p38 mitogen-activated protein kinase and NADPH-cytochrome P450 reductase in Alzheimer's disease. *Exp. Ther. Med.* **14(5),** 4755-4760 (2017).
6. Pandey, A.V. and Flück, C.E. NADPH P450 oxidoreductase: Structure, function, and pathology of diseases. *Pharmacol. Ther.* **138(2),** 229-254 (2013).

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