Active Cytochrome P450 3A4 (CYP3A4)

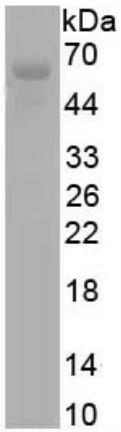
Catalog#:PEH12910

概述（Summary）

别称（Alternative Names）	CYP3A3; CYPIIIA4; 1,8-cineole 2-exo-monooxygenase; Albendazole sulfoxidase; Nifedipine oxidase; Quinine 3-monooxygenase; Taurochenodeoxycholate 6-alpha-hydroxylase
纯度（Purity）	Greater than 90% as determined by reducing SDS-PAGE.
内毒素（Endotoxin level）	Please contact with the lab for this information
蛋白构建（Construction）	【Pro344-Asp497】
Accession #	P08684
表达宿主（Host）	E.coli
种属（Species）	Homo sapiens (Human)
预测分子量（Predicted MW）	21.6 kDa
制剂（Form）	Lyophilized from a 0.2 μm filtered solution of 20mM Tris, 150mM NaCl, pH8.0, containing 1mM EDTA, 1mM DTT, 0.01% SKL, 5% Trehalose and Proclin300.
运输方式（Shipping）	The product is shipped with ice bag. Upon receipt, store it immediately at the temperature listed below.
稳定性&储存（Stability &Storage）	12 months at -20°C to -80°C in lyophilized state.6 months at -20°C to -80°C under sterile conditions after reconstitution.7-10 days at 2°C to 8°C under sterile conditions after reconstitution.Please minimize freeze-thaw cycles.
复溶（Reconstitution）	Reconstitute in ddH_2O to a concentration of 0.1-0.2 mg/mL. Do not vortex.
背景介绍（References）	A cytochrome P450 monooxygenase involved in the metabolism of sterols, steroid hormones, retinoids and fatty acids. Mechanistically, uses molecular oxygen inserting one oxygen atom into a substrate, and reducing the second into a water molecule, with two electrons provided by NADPH via cytochrome P450 reductase (NADPH--hemoprotein reductase). Catalyzes the hydroxylation of carbon-hydrogen bonds. Exhibits high catalytic activity for the formation of hydroxyestrogens from estrone (E1) and 17beta-estradiol (E2), namely 2-hydroxy E1 and E2, as well as D-ring hydroxylated E1 and E2 at the C-16 position. Plays a

role in the metabolism of androgens, particularly in oxidative deactivation of testosterone. Metabolizes testosterone to less biologically active 2beta- and 6beta-hydroxytestosterones. Contributes to the formation of hydroxycholesterols (oxysterols), particularly A-ring hydroxylated cholesterol at the C-4beta position, and side chain hydroxylated cholesterol at the C-25 position, likely contributing to cholesterol degradation and bile acid biosynthesis. Catalyzes bisallylic hydroxylation of polyunsaturated fatty acids (PUFA). Catalyzes the epoxidation of double bonds of PUFA with a preference for the last double bond. Metabolizes endocannabinoid arachidonoylethanolamide (anandamide) to 8,9-, 11,12-, and 14,15-epoxyeicosatrienoic acid ethanolamides (EpETrE-EAs), potentially modulating endocannabinoid system signaling. Plays a role in the metabolism of retinoids. Displays high catalytic activity for oxidation of all-trans-retinol to all-trans-retinal, a rate-limiting step for the biosynthesis of all-trans-retinoic acid (atRA). Further metabolizes atRA toward 4-hydroxyretinoate and may play a role in hepatic atRA clearance. Responsible for oxidative metabolism of xenobiotics. Acts as a 2-exo-monooxygenase for plant lipid 1,8-cineole (eucalyptol). Metabolizes the majority of the administered drugs. Catalyzes sulfoxidation of the anthelmintics albendazole and fenbendazole. Hydroxylates antimalarial drug quinine. Acts as a 1,4-cineole 2-exo-monooxygenase. Also involved in vitamin D catabolism and calcium homeostasis. Catalyzes the inactivation of the active hormone calcitriol (1-alpha,25-dihydroxyvitamin D(3)).

电泳图（SDS-PAGE image）



Greater than 90% as determined by reducing SDS-PAGE.

活性图（Bioactivity image）

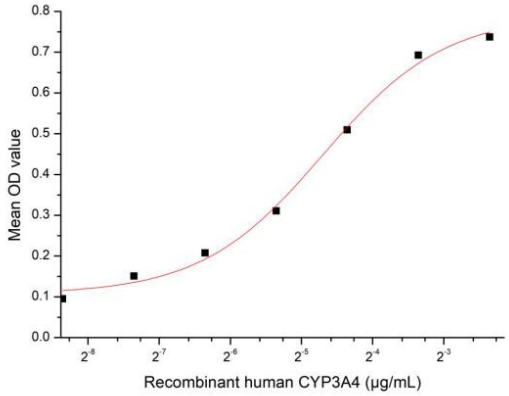


Figure 1. The binding activity of CYP3A4 and CYP1A1

Cytochrome P450 3A4 (CYP3A4), a member of the cytochrome P450 superfamily of heme - containing enzymes, is predominantly expressed in the human liver and small intestine, serving as a key player in xenobiotic metabolism and endobiotic biotransformation. It catalyzes the oxidation of over 50% of clinically used drugs, including statins, immunosuppressants, and anticancer agents, by adding oxygen atoms to hydrophobic substrates, thereby facilitating their excretion. CYP3A4 expression and activity are highly variable among individuals due to genetic polymorphisms, environmental inducers (e.g., rifampicin, phenobarbital) and inhibitors (e.g., ketoconazole, grapefruit juice). Beyond drug metabolism, it participates in the breakdown of endogenous compounds such as steroids and bile acids, maintaining physiological homeostasis. Notably, CYP3A4 and CYP1A1, both phase I metabolic enzymes, exhibit potential functional binding to synergistically modulate the metabolism of shared substrates, with their interaction being a critical part of the hepatic metabolic network.To detect the activity of recombinant CYP3A4, a functional ELISA assay was performed to evaluate the interaction between recombinant human CYP3A4 and recombinant human CYP1A1.Briefly, biotin-linked CYP3A4 were diluted serially in PBS, with 0.01% BSA (pH 7.4). Duplicate samples of 100μl were then transferred to CYP1A1-coated microtiter wells and incubated for 1h at 37℃. Wells were washed with PBST 3 times and incubation with Streptavidin-HRP for 30min, then wells were aspirated and washed 5 times. With the addition of substrate solution, wells were incubated 15-25 minutes at 37℃. Finally, add 50μl stop solution to the wells and read at 450nm immediately. The binding activity of CYP3A4 and CYP1A1 was shown in Figure 1, the EC50 for this effect is 0.03849μg/mL..

注意事项（Note）