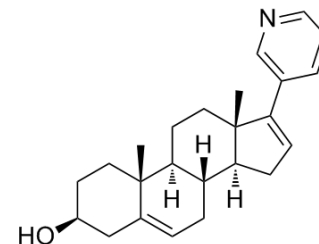


Abiraterone

Cat. No.:	HY-70013
CAS No.:	154229-19-3
Molecular Formula:	C ₂₄ H ₃₁ NO
Molecular Weight:	349.51
Target:	Cytochrome P450
Pathway:	Metabolic Enzyme/Protease
Storage:	Powder -20°C 3 years 4°C 2 years In solvent -80°C 6 months -20°C 1 month



SOLVENT & SOLUBILITY

In Vitro

DMF : 8.75 mg/mL (25.04 mM; Need ultrasonic and warming)
 Ethanol : 5.4 mg/mL (15.45 mM; Need ultrasonic)
 DMSO : 5 mg/mL (14.31 mM; Need ultrasonic)

Preparing Stock Solutions	Solvent		1 mg	5 mg	10 mg
	Concentration	Mass			
	1 mM		2.8611 mL	14.3057 mL	28.6115 mL
	5 mM		0.5722 mL	2.8611 mL	5.7223 mL
	10 mM		0.2861 mL	1.4306 mL	2.8611 mL

Please refer to the solubility information to select the appropriate solvent.

BIOLOGICAL ACTIVITY

Description

Abiraterone is a potent and irreversible CYP17A1 inhibitor with antiandrogen activity, which inhibits both the 17 α -hydroxylase and 17,20-lyase activity of the cytochrome p450 enzyme CYP17 with IC₅₀s of 2.5 nM and 15 nM, respectively.

IC₅₀ & Target

IC₅₀:17 α -hydroxylase (2.5 nM), 17,20-lyase (15 nM)^[6]

In Vitro

Significant inhibition of proliferation of the AR-positive prostate cancer cell lines LNCaP and VCaP with doses of Abiraterone \geq 5 μ M is confirmed^[2]. Abiraterone shows IC₅₀ values of 15 nM and 2.5 nM for the 17,20-lyase and 17 α -hydroxylase (CYP17 is a bifunctional enzyme with both 17 α -hydroxylase and 17,20-lyase activity). Abiraterone inhibits human 17,20-lyase and 17 α -hydroxylase with IC₅₀ of 27 and 30 nM respectively^[3]. Abiraterone inhibits recombinant human 3 β HSD1 and 3 β HSD2 activity with competitive K_i values of 2.1 and 8.8 μ M. 10 μ M Abiraterone is sufficient to completely block synthesis of 5 α -dione and DHT in both cell lines. Treatment with abi significantly inhibited CRPC progression in the robustly growing subset, effectively putting a ceiling on tumor growth over 4 weeks of treatment (P<0.00001). [³H]-dehydroepiandrosterone (DHEA) depletion and Δ^4 -androstenedione (AD) accumulation are inhibited by Abiraterone in LNCaP, with an IC₅₀<1 μ M^[4].

MCE has not independently confirmed the accuracy of these methods. They are for reference only.

In Vivo

The 0.5 mmol/kg/d Abiraterone treatment dose is previously shown to yield serum concentrations of about 0.5 to 1 μ M. Xenograft tumor growth in the control group is widely variable, with some tumors growing slowly and only a subset of tumors exhibiting robust growth^[4]. Following i.v. administration (5 mg/kg) the clearance (Cl) and volume of distribution (V_d) are found to be 31.2 mL/min/kg and 1.97 L/kg, respectively. The $AUC_{0-\infty}$ (area under the plasma concentration-time curve from time zero to infinity time point) is found to be 2675 ng*h/mL. The terminal half-life ($t_{1/2}$) is 0.73 h. Because of high clearance, Abiraterone (ART) is quantifiable only until 2 h following i.v. administration^[5].

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PROTOCOL

Cell Assay ^[2]

LNCaP and VCaP cells are seeded in 96-well plates and grown in CSS-supplemented phenol red-free or FBS-supplemented media for 7 days. Cells are treated with Abiraterone (5 μ M and 10 μ M) at 24 and 96 hours after plating and cell viability is determined on day 7 by adding CellTiter Glo and measuring luminescence^[2].

MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Animal Administration ^{[4][5]}

Mice^[4]

Male NOD/SCID mice 6 to 8 weeks of age are surgically orchiectomized and implanted with a 5 mg 90-day sustained release DHEA pellet to mimic CRPC with human adrenal physiology. Two days later, 7×10^6 LAPC4 cells are injected subcutaneously with Matrigel. Tumor dimensions are measured 2 to 3 times per week, and volume is calculated as length \times width \times height \times 0.52. Once tumors reach 300 mm³, mice are randomly assigned to vehicle or Abiraterone treatment groups. Mice in the Abiraterone group are treated with 5 mL/kg intraperitoneal injections of 0.5 mmol/kg/d (0.1 mL 5% benzyl alcohol and 95% safflower oil solution) and control mice with vehicle only, once daily for 5 days per week over a duration of 4 weeks (n=8 mice per treatment). Statistical significance between Abiraterone and vehicle treatment groups is assessed by ANOVA based on a mixed-effect model.

Rats^[5]

Male Sprague-Dawley rats (n=8, 240-260 g) are used. Blood samples (450 μ L) are obtained following an i.v. 5 mg/kg dose of ART into polypropylene tubes containing Na₂-EDTA solution as an anticoagulant and at pre-dose, 0.12, 0.25, 0.5, 1, 2, 4, 6, 8 and 24 h (a sparse sampling protocol is adopted during blood collection and at each time point blood is collected from four animals). Plasma is harvested by centrifuging the blood using a Biofuge at 1760g for 5 min and stored frozen at $-80 \pm 10^\circ\text{C}$ until analysis.

MCE has not independently confirmed the accuracy of these methods. They are for reference only.

CUSTOMER VALIDATION

- Nature. 2012 Jan 22;482(7383):116-9.
- Cell Res. 2020 Oct;30(10):833-853.
- Eur Urol. 2015 Aug;68(2):228-35.
- Anal Chem. 2016 Oct 4;88(19):9347-9350.
- Acta Pharmacol Sin. 2021 Jan;42(1):108-114.

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[1]. Attard G, et al. Phase I clinical trial of a selective inhibitor of CYP17, abiraterone acetate, confirms that castration-resistant prostate cancer commonly remains hormone

driven. J Clin Oncol. 2008 Oct 1;26(28):4563-71.

[2]. Richards J, et al. Interactions of abiraterone, eplerenone, and prednisolone with wild-type and mutant androgen receptor: a rationale for increasing abiraterone exposure or combining with MDV3100. Cancer Res. 2012 May 1;72(9):2176-82.

[3]. Stein MN, et al. Androgen synthesis inhibitors in the treatment of castration-resistant prostate cancer. Asian J Androl. 2014 May-Jun;16(3):387-400.

[4]. Li R, et al. Abiraterone inhibits 3 β -hydroxysteroid dehydrogenase: a rationale for increasing drug exposure in castration-resistant prostate cancer. Clin Cancer Res. 2012 Jul 1;18(13):3571-9.

[5]. Kumar SV, et al. Validated RP-HPLC/UV method for the quantitation of abiraterone in rat plasma and its application to a pharmacokinetic study in rats. Biomed Chromatogr. 2013 Feb;27(2):203-7.

[6]. Stein MN, et al. Androgen synthesis inhibitors in the treatment of castration-resistant prostate cancer. Asian J Androl. 2014 May-Jun;16(3):387-400.

Caution: Product has not been fully validated for medical applications. For research use only.

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