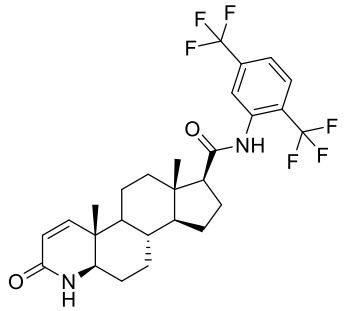
Product data sheet

MedKoo Cat#: 206219 Name: Dutasteride CAS#: 164656-23-9 Chemical Formula: $C_{27}H_{30}F_6N_2O_2$ Exact Mass: 528.22115 Molecular Weight: 528.53	
Product supplied as:	Powder
Purity (by HPLC):	≥ 98%
Shipping conditions	Ambient temperature
Storage conditions:	Powder: -20°C 3 years; 4°C 2 years.
	In solvent: -80°C 3 months; -20°C 2 weeks.

1. Product description:
Dutasteride (marketed as Avodart, Avidart, Avolve, Duagen, Dutas, Dutagen, Duprost) is a 5-alpha-reductase inhibitor that inhibits the conversion of testosterone into dihydrotestosterone (DHT). It is approved for the treatment of benign prostatic hyperplasia (BPH) and is prescibed off-label for the treatment of male pattern baldness (MPB). Avodart is manufactured and marketed by GlaxoSmithKline.

2. CoA, QC data, SDS, and handling instruction
SDS and handling instruction, CoA with copies of QC data (NMR, HPLC and MS analytical spectra) can be downloaded from the product web page under "QC And Documents" section. Note: copies of analytical spectra may not be available if the product is being supplied by MedKoo partners. Whether the product was made by MedKoo or provided by its partners, the quality is 100% guaranteed.

3. Solubility data

Solvent	Max Conc. mg/mL	Max Conc. mM
DMSO	33.33	63.06
Ethanol	25	47.30

4. Stock solution preparation table:

Concentration / Solvent Volume / Mass	1 mg	5 mg	10 mg
1 mM	1.89 mL	9.46 mL	18.92 mL
5 mM	0.38 mL	1.89 mL	3.78 mL
10 mM	0.19 mL	0.95 mL	1.89 mL
50 mM	0.04 mL	0.19 mL	0.38 mL

5. Molarity Calculator, Reconstitution Calculator, Dilution Calculator
Please refer the product web page under section of "Calculator"

6. Recommended literature which reported protocols for in vitro and in vivo study
In vitro study

1. Biancolella M, Valentini A, Minella D, Vecchione L, D'Amico F, Chillemi G, Gravina P, Bueno S, Prosperini G, Desideri A, Federici G, Bernardini S, Novelli G. Effects of dutasteride on the expression of genes related to androgen metabolism and related pathway in human prostate cancer cell lines. Invest New Drugs. 2007 Oct;25(5):491-7. doi: 10.1007/s10637-007-9070-7. Epub 2007 Jul 18. PMID: 17636412.

In vivo study

1. Margiotta-Casaluci L, Hannah RE, Sumpter JP. Mode of action of human pharmaceuticals in fish: the effects of the 5-alpha-reductase inhibitor, dutasteride, on reproduction as a case study. Aquat Toxicol. 2013 Mar 15;128-129:113-23. doi: 10.1016/j.aquatox.2012.12.003. Epub 2012 Dec 10. PMID: 23280489.

2. Gul A, Gul M, Ozsoy S, Sarac T, Celik DS, Semercioz A, Serefoglu EC. Impact of dutasteride on spermatogenesis and oxidative status in rats. Arch Esp Urol. 2020 Apr;73(3):230-235. English, Spanish. PMID: 32240114.

7. Bioactivity

Product data sheet

Biological target:

Dutasteride (GI198745, GG-745) is a dual 5-α reductase inhibitor that inhibits conversion of testosterone to dihydrotestosterone (DHT).

In vitro activity

The aim of this study is to investigate the cellular and molecular effects of dutasteride, a potent inhibitor of 5alpha-reductase type I and type II, in androgen-responsive (LNCaP) and androgen-unresponsive (DU145) human prostate cancer(PCa) cell lines. The expression pattern of 190 genes, selected on the basis of their proved or potential role in prostate cancerogenesis related to androgen signalling, were analysed using a low density home-made oligoarray (AndroChip 2). These results show that dutasteride reduces cell viability and cell proliferation in both cell lines tested. AndroChip 2 gene signature identified in LNCaP a total of 11 genes differentially expressed (FC >or= +/-1.5). Eight of these genes, were overexpressed and three were underexpressed. Overexpressed genes included genes encoding for proteins involved in biosynthesis and metabolism of androgen (HSD17B1;HSD17B3;CYP11B2), androgen receptor and androgen receptor co-regulators (AR;CCND1), and signal transduction(ERBB2; V-CAM; SOS1) whereas, underexpressed genes (KLK3; KLK2; DHCR24) were androgen-regulated genes (ARGs). No differentially expressed genes were scored in DU145. Microarray data were confirmed by quantitative real-time PCR assay (QRT-PCR). These data offer a selective genomic signature for dutasteride treatment in prostate epithelial cells and provide important insights in prostate cancer pathophysiology.

Reference: Invest New Drugs. 2007 Oct;25(5):491-7. https://doi.org/10.1007/s10637-007-9070-7

In vivo activity

This research addressed the question of whether or not dutasteride, a pharmaceutical used to treat benign prostatic hyperplasia, may cause adverse effects in a teleost fish, the fathead minnow (Pimephales promelas), by inhibiting the activity of both isoforms of 5α-reductase (5αR), the enzyme that converts testosterone into dihydrotestosterone (DHT). Mammalian pharmacological and toxicological information were used to guide the experimental design and the selection of relevant endpoints, according to the so-called "read-across approach", suggesting that dutasteride may affect male fertility and steroid hormone dynamics. Therefore, a 21-day reproduction study was conducted to determine the effects of dutasteride (10, 32 and 100 μg/L) on fish reproduction. Exposure to dutasteride significantly reduced fecundity of fish and affected several aspects of reproductive endocrine functions in both males and females. However, none of the observed adverse effects occurred at concentrations of exposure lower than 32 μg/L; this, together with the low volume of drug prescribed every year (10.34 kg in the UK in 2011), and the extremely low predicted environmental concentration (0.03 ng/L), suggest that, at present, the potential presence of dutasteride in the environment does not represent a threat to wild fish populations.

Reference: Aquat Toxicol. 2013 Mar 15;128-129:113-23. https://linkinghub.elsevier.com/retrieve/pii/S0166-445X(12)00322-0