

Product Data Sheet

Product Name: Propyl pyrazole triol (PPT)

Cat. No.: GC14370

Chemical Properties

Cas. No. 263717-53-9

Chemical Name 4-(1,5-bis(4-hydroxyphenyl)-4-propyl-1H-pyrazol-3(2H)-ylidene)cyclohexa-2,5-dienone

SMILES OC1=CC=C(C=C1)C(N(C(C=C2)=CC=C2O)N/3)=C(CCC)C3=C(C=C4)/C=CC4=O

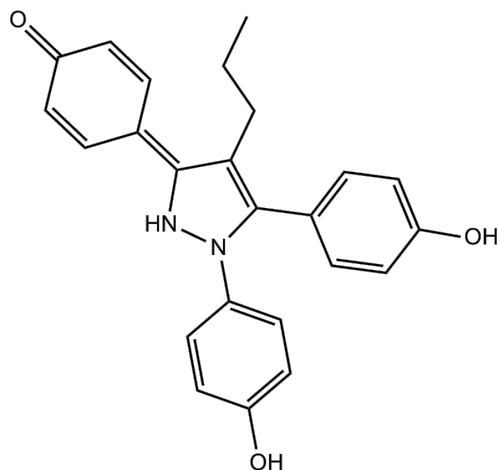
Formula $C_{24}H_{22}N_2O_3$ M.Wt 386.45

Solubility $\leq 10\text{mg/ml}$ in ethanol; 20mg/ml in DMSO Storage Store at -20°C

General tips For obtaining a higher solubility, please warm the tube at 37°C and shake it in the ultrasonic bath for a while. Stock solution can be stored below -20°C for several months.

Shipping Condition Evaluation sample solution: ship with blue ice All other available size: ship with RT, or blue ice upon request.

Structure



Protocol

Cell experiment [1]:

Cell lines Adult rat dorsal root ganglion (DRG) neurons

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

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DRG neurons from 2-month-old adult male and female SD rats (weight 200-250g) were dissected, isolated, and dissociated. Propyl pyrazole triol were Preparation Method added at specific time points to maintain a consistent total culture period of 24h for all experiments. For 24h treatments, agents were added at the time of seeding.

Reaction
Conditions 1, 10, 100nM; 1, 24h

Applications Exposure of DRG neurons to increasing concentrations of Propyl pyrazole triol for 1h dose-dependently elevated AMP-activated protein kinase (AMPK) phosphorylation, whereas a 24h treatment with 10nM Propyl pyrazole triol significantly increased total neurite outgrowth, augmented nuclear activating transcription factor 3 (ATF3) expression, and enhanced multiple indices of mitochondrial function.

Animal experiment [2]:

Animal models Adult female Sprague-Dawley rats

Preparation Method The experiment consisted of rats divided into five groups of 10 animals each. The first group comprised intact control rats at random stages of the estrous cycle treated with vehicle [4% ethanol, 4% polyethylene glycol 600 (PEG-600), 1% gelatin, and 0.9% NaCl]. The other group comprised ovariectomized rats. Ovariectomy was performed on animals under anesthesia with a 1.5% isoflurane-air mixture. Treatments began 2 days after ovariectomy with one daily subcutaneous injection (0.5ml/rat) for 14 days of vehicle, 1mg/kg Propyl pyrazole triol.

Dosage form 1mg/kg; subcutaneous injection

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Applications

Sixteen days after ovariectomy, uterine weight in ovariectomized rats dropped by 85% compared with intact rats, whereas Propyl pyrazole triol treatment raised uterine weight above that of intact rats. In the prefrontal cortex and striatum, ovariectomy did not alter GluR2 mRNA, but Propyl pyrazole triol treatment reduced it by 31% and 20%, respectively. In the striatum and nucleus accumbens, ovariectomy increased [³H]α-amino-3-hydroxy-5-methyl-4-isoxazolepropionic acid (AMPA) binding, and Propyl pyrazole triol treatment prevented this increase in each region.

References:

- [1] Mishra P, Albensi BC, Fernyhough P. Estradiol activates the CaMKK γ /AMPK pathway to enhance neurite outgrowth in cultured adult sensory neurons. *Mol Cell Neurosci*. 2025;133:104008.
- [2] Le Saux M, Estrada-Camarena E, Di Paolo T. Selective estrogen receptor- α but not - β agonist treatment modulates brain alpha-amino-3-hydroxy-5-methyl-4-isoxazolepropionic acid receptors. *J Neurosci Res*. 2006;84(5):1076-1084.

Background

Propyl pyrazole triol (PPT) is a selective estrogen receptor α (ER α) agonist that can shield neurons from oxidative stress and inflammatory damage through ER α activation in the nervous system^[1]. The binding affinity of Propyl pyrazole triol to the two ERs (ER α and ER β) shows more than a 400-fold preference for ER α ^[2]. Propyl pyrazole triol is shown as estradiol to modulate hippocampal N-methyl-D-aspartate (NMDA) receptors and AMP-activated protein kinase (AMPK) receptors in the cortex and striatum of ovariectomized rats^[3].

In vitro, adult rat dorsal root ganglion neurons were exposed to 1, 10, or 100nM Propyl pyrazole triol. A 1h treatment elicited a concentration-dependent rise in AMPK phosphorylation, whereas a 24h exposure to 10nM Propyl pyrazole triol significantly increased total neurite outgrowth, elevated nuclear activating transcription factor 3 (ATF3) expression, and improved multiple parameters of mitochondrial function^[4]. Treatment of aortic smooth-muscle cells with 100 μ M Propyl pyrazole triol raised cyclic GMP (cGMP) from a basal level of 0.84 $\pm$ 0.28 to 2.05 $\pm$ 0.3pmol/mg protein, while 50 μ M Propyl pyrazole triol reduced the intracellular calcium signal by 70.6 $\pm$ 9.95%^[5].

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In vivo, starting two days after ovariectomy, rats received daily subcutaneous injections of 1mg/kg Propyl pyrazole triol for 14 days, which prevented the loss of uterine weight, blocked the rise in [³H]α-amino-3-hydroxy-5-methyl-4-isoxazolepropionic acid (AMPA) binding in the striatum and nucleus accumbens, and reduced GluR2 mRNA in the prefrontal cortex and striatum^[6]. Male rats received daily subcutaneous injections with 1mg/kg Fadrozole 1h before mating for 29 days and were given an additional single 1mg/kg Propyl pyrazole triol subcutaneous injection on Days 13 and 29 showed more mounting but reached sexual satiety sooner^[7].

References:

- [1] Zhang K, Hou B, Yan T, et al. Identification of therapeutic target genes for age-related hearing loss through systematic genome-wide mendelian randomization of druggable genes. *Exp Gerontol.* 2025;200:112676.
- [2] Vijaykumar D, Al-Qahtani MH, Welch MJ, et al. Synthesis and biological evaluation of a fluorine-18 labeled estrogen receptor-alpha selective ligand: [18F] propyl pyrazole triol. *Nucl Med Biol.* 2003;30(4):397-404.
- [3] Morissette M, Le Saux M, D'Astous M, et al. Contribution of estrogen receptors alpha and beta to the effects of estradiol in the brain. *J Steroid Biochem Mol Biol.* 2008;108(3-5):327-338.
- [4] Mishra P, Albensi BC, Fernyhough P. Estradiol activates the CaMKKβ/AMPK pathway to enhance neurite outgrowth in cultured adult sensory neurons. *Mol Cell Neurosci.* 2025;133:104008.
- [5] Alda JO, Valero MS, Pereboom D, et al. Endothelium-independent vasorelaxation by the selective alpha estrogen receptor agonist propyl pyrazole triol in rat aortic smooth muscle. *J Pharm Pharmacol.* 2009;61(5):641-646.
- [6] Le Saux M, Estrada-Camarena E, Di Paolo T. Selective estrogen receptor-alpha but not -beta agonist treatment modulates brain alpha-amino-3-hydroxy-5-methyl-4-isoxazolepropionic acid receptors. *J Neurosci Res.* 2006;84(5):1076-1084.
- [7] Corre PHC, Mainwaring JM, Peralta KKZ, et al. Low dose of propyl-pyrazole-triol, an agonist of estrogen receptor alpha, administration stimulates the Coolidge effect in fadrozole-treated male rats. *Horm Behav.* 2024;161:105520.

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