Small Molecules

Y-27632 (Dihydrochloride)

RHO/ROCK pathway inhibitor; Inhibits ROCK1 and ROCK2

Catalog #	72302	1 mg
	72304	5 mg
	72307	5 x 10 mg
	72308	50 mg
	100-1044	500 mg

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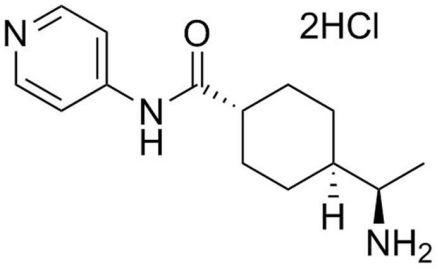
Product Description

Y-27632 (Dihydrochloride) is a cell-permeable, highly potent and selective inhibitor of Rho-associated, coiled-coil containing protein kinase (ROCK). Y-27632 inhibits both ROCKI (Ki = 220 nM) and ROCKII (Ki = 300 nM) by competing with ATP for binding to the catalytic site (Davies et al.; Ishizaki et al.).

Alternative Names: ROCK inhibitor
CAS Number: 129830-38-2
Chemical Formula: $C_{14}H_{21}N_3O \cdot 2HCl$
Molecular Weight: 320.3 g/mol
Purity: ≥ 98%
Chemical Name: 4-[(1R)-1-aminoethyl]-N-4-pyridinyl-trans-cyclohexanecarboxamide, dihydrochloride
Structure:



Properties

Physical Appearance: A crystalline solid

Storage: Product stable at -20°C as supplied. Protect from prolonged exposure to light. For long-term storage, store with a desiccant.
Stable as supplied for 12 months from date of receipt.

Solubility:
· PBS (pH 7.2) ≤ 30 mM
· DMSO ≤ 90 mM
· Absolute ethanol ≤ 15 mM
For example, to prepare a 5 mM stock solution in PBS or water, resuspend 1 mg in 624 µL of PBS (pH 7.2) or water.

Prepare stock solution fresh before use. Stock solutions in PBS or water are stable at -20°C for up to 6 months. Aliquot into working volumes to avoid repeated freeze-thaw cycles. The effect of storage of stock solution on compound performance should be tested for each application.

For use as a cell culture supplement, stock solution should be diluted into culture medium immediately before use. This product has been shown to be effective at a final concentration of 10 µM (Ungrin et al.; Watanabe et al.). Avoid final DMSO concentration above 0.1% due to potential cell toxicity.

Published Applications

MAINTENANCE AND SELF-RENEWAL
· Enhances survival of human embryonic stem (ES) cells when they are dissociated to single cells by preventing dissociation-induced apoptosis (anoikis), thus increasing their cloning efficiency (Watanabe et al.).
· Improves embryoid body formation using forced-aggregation protocols (Ungrin et al.).
· Increases the survival of cryopreserved single human ES cells after thawing (Li et al.).
· Blocks apoptosis of mouse ES-derived neural precursors after dissociation and transplantation (Koyanagi et al.).
REPROGRAMMING
· Direct lineage reprogramming of fibroblasts to mature neurons, in combination with CHIR99021 (Catalog #72052), RepSox (Catalog #73792), Forskolin (Catalog #72112), SP600125 (Catalog #72642), Gö6983 (Catalog #72462), and Valproic Acid (Catalog #72292) (Hu et al.).
DIFFERENTIATION
· Improves survival of human ES cell monolayers at the initiation of differentiation protocols (Rezania et al.)

References

Davies SP et al. (2000) Specificity and mechanism of action of some commonly used protein kinase inhibitors. Biochem J 351(Pt 1): 95–105.
Hu W et al. (2015) Direct conversion of normal and Alzheimer's Disease human fibroblasts into neuronal cells by small molecules. Cell Stem Cell 17(2): 204–12.
Ishizaki T et al. (2000) Pharmacological properties of Y-27632, a specific inhibitor of rho-associated kinases. Mol Pharmacol 57(5): 976–83.
Koyanagi M et al. (2008) Inhibition of the Rho/ROCK pathway reduces apoptosis during transplantation of embryonic stem cell-derived neural precursors. J Neurosci Res 86(2): 270–80.
Li X et al. (2009) ROCK inhibitor improves survival of cryopreserved serum/feeder-free single human embryonic stem cells. Hum Reprod 24(3): 580–9.
Rezania A et al. (2014) Reversal of diabetes with insulin-producing cells derived in vitro from human pluripotent stem cells. Nat Biotechnol 32(11): 1121–33.
Ungrin MD et al. (2008) Reproducible, ultra high-throughput formation of multicellular organization from single cell suspension-derived human embryonic stem cell aggregates. PLoS One 3(2): e1565.
Watanabe K et al. (2007) A ROCK inhibitor permits survival of dissociated human embryonic stem cells. Nat Biotechnol 25(6): 681–6.

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This product is hazardous. Please refer to the Safety Data Sheet (SDS).