

# Y-27632 (Dihydrochloride)

RHO/ROCK pathway inhibitor; Inhibits ROCK1 and ROCK2

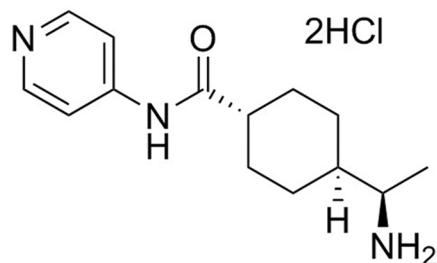
|                   |           |
|-------------------|-----------|
| Catalog #72302    | 1 mg      |
| Catalog #72304    | 5 mg      |
| Catalog #72307    | 5 x 10 mg |
| Catalog #72308    | 50 mg     |
| Catalog #100-1044 | 500 mg    |

## 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 ROCK1 (K<sub>i</sub> = 220 nM) and ROCK2 (K<sub>i</sub> = 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 <sub>14</sub> H <sub>21</sub> N <sub>3</sub> O · 2HCl                           |
| Molecular Weight:  | 320.3 g/mol   |
| Purity:            | ≥ 98%   |
| Chemical Name:     | 4-[(1R)-1-aminoethyl]-N-4-pyridinyl-trans-cyclohexanecarboxamide, dihydrochloride |

Structure:



## Properties

**Product Format:** A crystalline solid

**Stability and 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.

**Preparation:**

- Water  $\leq$  90 mM
- Phosphate-buffered saline (PBS; pH 7.2)  $\leq$  230 mM
- DMSO  $\leq$  90 mM
- Absolute ethanol  $\leq$  3.1 mM

For example, to prepare 10 mM stock solution in PBS or water, resuspend 1 mg in 312  $\mu$ L of PBS (pH 7.2) or water.

Prepare stock solution fresh before use. For long-term storage, 10 mM stock solutions (prepared in PBS or water) should be stored at -20°C and used within 12 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  $\mu$ M (Ungrin et al.; Watanabe et al.). Avoid final DMSO or absolute ethanol concentrations 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 (Sodium Salt; 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.

## Related Products

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## Warning

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

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