

## 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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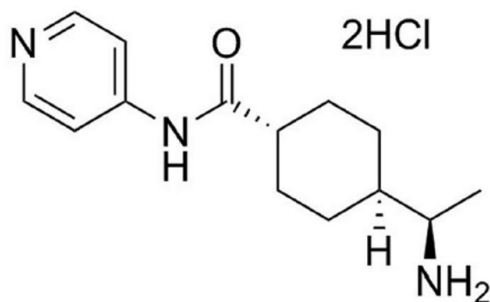
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## Product Description

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 ( $K_i = 220$  nM) and ROCKII ( $K_i = 300$  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:	$\geq 98\%$
Chemical Name:	4-[(1R)-1-aminoethyl]-N-4-pyridinyl-trans-cyclohexanecarboxamide, dihydrochloride
Structure:	



## Properties

Physical Appearance:	A crystalline solid
Storage:	Product stable at $-20^{\circ}C$ 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:	<ul style="list-style-type: none"><li>• Water <math>\leq 90</math> mM</li><li>• PBS (pH 7.2) <math>\leq 230</math> mM</li><li>• DMSO <math>\leq 90</math> mM</li><li>• Absolute ethanol <math>\leq 3.1</math> mM</li></ul>

For example, to prepare 5 mM stock solution in PBS or water, resuspend 1 mg in 624  $\mu L$  of PBS (pH 7.2) or water.

Prepare stock solution fresh before use. For long-term storage, 5 mM stock solutions (prepared in PBS or water) should be stored at  $-20^{\circ}C$  and used within 1 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

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- 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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