

Technical Data Sheet

Small Molecules

Chroman 1

Catalog Number(s) SML20A, SML20B

Synonyms ROCK-II Inhibitor, ROCK2 Inhibitor

Size 5 mg or 10 mg

Description Human pluripotent stem cells (hPSCs) are extremely sensitive to environmental changes, and require safe, controlled, and efficient strategies for the development, expansion, and banking of cell-based therapeutic products. Chroman 1 is a highly potent and selective ROCK inhibitor (both ROCK 1 and ROCK 2) that promotes survival of dissociated hPSCs in culture when used at a final concentration of 50 nM. Significant improvements to cell viability, clonogenicity, and expansion are seen when Chroman 1 is applied in combination with Emricasan, Polyamines, and Trans-ISRIB, a combination known as CEPT.

Chroman 1 is more effective at lower doses than Y27632, with ROCK1 IC_{50} = 52 pM and ROCK2 IC_{50} = 1 pM.

Chroman 1 is also more specific than Y27632, not showing any significant kinase inhibition outside ROCK1/2 at 50 nM, unlike off-target effects observed with Y27632 applied at $10 \mu M$. Chroman 1 exhibits > 2000-fold selectivity for ROCK2 over a range of related kinases including MRCK (IC_{50} = 150 nM), PKA (IC_{50} >20000 nM), and AKT1 (IC_{50} >20000 nM).

Molecular Weight 436.5

Molecular Formula $C_{24}H_{28}N_4O_4$

Chemical Name (3S)-N-[2-[2-(dimethylamino)ethoxy]-4-(1H-pyrazol-4-yl)phenyl]-6-methoxy-3,4-dihydro-2H-chromene-3-carboxamide

CAS Number 1273579-40-0

Target ROCK, ROCK1, ROCK2

Appearance White to pink (solid)

Purity $\geq 98\%$ by LCMS

Solubility & Reconstitution

Stock Concentration	Compound Mass		
	1 mg	5 mg	10 mg
1 mM	2.2910 mL	11.4548 mL	22.9095 mL
5 mM	0.4582 mL	2.2910 mL	4.5819 mL
10 mM	0.2291 mL	1.1455 mL	2.2910 mL
50 mM	0.0458 mL	0.2291 mL	0.4582 mL

Solvent Volume



Solvent & Solubility

DMSO: Soluble in DMSO > 50 mg/mL (114.55 mM); saturation unknown
Gentle warming and vortexing may be needed for complete solubilization at high concentrations.

Storage

Powder: 20°C 3 years
 4°C 2 years

In solvent: -80°C 6 months
 -20°C 1 month

Store as lyophilized powder or concentrated stock solutions.
Prepare working solutions in appropriate cell culture media just prior to use.

Pathway

Stem Cell; Wnt; TGF-beta/Smad; Cell Cycle; DNA damage; Cytoprotection

IC₅₀

ROCK 1	ROCK 2	MRCK
52 pM	1 pM	150 nM

Reconstitution

1. From the lyophilized compound, prepare a concentrated stock solution using the appropriate solvent (DMSO), according to the solubility table or custom calculations. Example: To generate a 5 mM concentrated stock solution of Chroman 1, add 2.291 mL of DMSO to 5 mg of Chroman 1.
2. Ensure the compound is completely dissolved in the solvent. This may require gentle warming and/or vortexing/sonication to fully reconstitute the compound.
3. Aliquot the concentrated stock solution in single-use volumes, and either use immediately or freeze at -20°C or -80°C for later use. Avoid freeze/thaw cycles.
4. Concentrated stock solutions are designed to be diluted just prior to use (e.g. 1:1000 dilution in cell culture medium). For use in cell culture, warm the medium just prior to adding the reconstituted compound.

References

1. Y Chen, et al. (2021) A Versatile Polypharmacology Platform Promotes Cytoprotection and Viability of Human Pluripotent and Differentiated Cells. Nature Methods. May; 18(5): 528-514
2. YT Chen et al (2011) Asymmetric synthesis of potent chroman-based Rho kinase (ROCK-II) inhibitors. Med. Chem. Commun. 2 73
3. CA Tristan et al. (2021) Robotic high-throughput biomanufacturing and functional differentiation of human pluripotent stem cells. Stem Cell Reports, Volume 16, Issue 12, 3078-3092

Related Products

Description	Cat. No.	Application
Y27632	SML13	ROCK inhibitor, cell survival, single cell cloning
Thiazovivin	SML10	ROCK inhibitor
Emricasan	SML21	Pan-caspase inhibitor, CEPT
Trans-ISRIB	SML22	Integrated stress response (ISR) inhibitor, CEPT
CET Cocktail	CET01	Enhanced stem cell survival cocktail, CEPT

