# Small Molecules

## Cyclopamine

Hedgehog pathway inhibitor; Inhibits Smoothened (SMO)

| | | |
|---|---|---|
| Catalog # | 72072 | 1 mg |
| | 72074 | 5 mg |

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## Product Description

Cyclopamine is a steroid alkaloid that inhibits the Hedgehog pathway at the point of the pathway activator Smoothened. Cyclopamine binds to the heptahelical bundle of Smoothened, a G protein-coupled receptor, and prevents it from signaling further downstream (Chen et al.).

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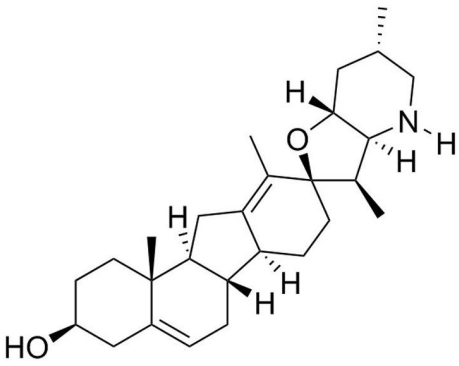
| Molecular Name: | Cyclopamine |
| Alternative Names: | 11-Deoxojervine; Jervine |
| CAS Number: | 4449-51-8 |
| Chemical Formula: | $C_{27}H_{41}NO_2$ |
| Molecular Weight: | 411.6 g/mol |
| Purity: | ≥ 95% |
| Chemical Name: | (2'R,3S,3'R,3'aS,6'S,6aS,6bS,7'aR,11aS,11bR)-1,2,3,3'a,4,4',5',6,6',6a,6b,7,7',7'a,8,11,11a,11b-octadecahydro-3',6',10,11b-tetramethyl-spiro[9H-benzo[a]fluorene-9,2'(3'H)-furo[3,2-b]pyridin]-3-ol |
| Structure: |  |



## Properties

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| Physical Appearance: | A crystalline solid |
| Storage: | Product stable at -20°C as supplied. Protect from prolonged exposure to light.<br>Stable as supplied for 12 months from date of receipt. |
| Solubility: | · Absolute ethanol ≤ 20 mM<br>For example, to prepare a 10 mM stock solution in absolute ethanol, resuspend 1 mg in 243 µL of absolute ethanol.<br><br>Prepare stock solution fresh before use. Information regarding stability of small molecules in solution has rarely been reported, however, as a general guide we recommend storage in absolute ethanol at -20°C. 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.<br><br>Compound has low solubility in aqueous media. For use as a cell culture supplement, stock solution should be diluted into culture medium immediately before use. Avoid final ethanol concentration above 0.1% due to potential cell toxicity. |

## Published Applications

MAINTENANCE AND SELF-RENEWAL
· Reduces proliferation of rat neural progenitor cells and mouse neurospheres (Lai et al., Palma & Ruiz i Altaba).
· Reduces proliferation of mouse mammospheres (Liu et al.).
· Inhibits the growth of human and mouse medulloblastoma cells, and human glioblastoma cells (Bar et al., Berman et al.).
DIFFERENTIATION
· Promotes differentiation of pancreatic cells from human embryonic stem cells (D'Amour et al.).
CANCER RESEARCH
· Inhibits the growth of human and mouse medulloblastoma cells, and human glioblastoma cells (Bar et al., Berman et al.).

## References

Bar EE et al. (2007) Cyclopamine-mediated hedgehog pathway inhibition depletes stem-like cancer cells in glioblastoma. Stem Cells 25(10): 2524–33.
Berman DM et al. (2002) Medulloblastoma growth inhibition by hedgehog pathway blockade. Science 297(5586): 1559–61.
Chen JK et al. (2002) Inhibition of Hedgehog signaling by direct binding of cyclopamine to Smoothened. Genes & Development 16(21): 2743–8.
D'Amour KA et al. (2006) Production of pancreatic hormone-expressing endocrine cells from human embryonic stem cells. Nature Biotechnology 24(11): 1392–401.
Lai K et al. (2003) Sonic hedgehog regulates adult neural progenitor proliferation in vitro and in vivo. Nature Neuroscience 6(1): 21–7.
Liu S et al. (2006) Hedgehog signaling and Bmi-1 regulate self-renewal of normal and malignant human mammary stem cells. Cancer Research 66(12): 6063–71.
Palma V & Ruiz i Altaba A. (2004) Hedgehog-GLI signaling regulates the behavior of cells with stem cell properties in the developing neocortex. Development 131(2): 337–45.

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