Hello Bio, Inc.
304 Wall St., Princeton, NJ 08540 USA

T. 609-683-7500
F. 609-228-4994

customercare-usa@hellobio.com

DATASHEET

Rapamycin

Product overview

Name	Rapamycin
Cat No	HB2779
Description	mTOR inhibitor and potent immunosuppressant. Also used in inducible gene editing methods (e.g. CRISPR/Cas9) and promotes hPSC differentiation.
Alternative names	Sirolimus
Biological action	Antibiotic
Antibiotic Spectrum	yeast and fungi
Purity	>98%

Biological Data

Biological description

Overview

Rapamycin is an mTOR inhibitor and potent immunosuppressant. It complexes with FKBP12 to bind mTORC1 to inhibit mTOR activity and block subsequent activation of p70 s6 kinase (IC_{50} = 50 pM).

Active in vivo.

Uses and applications

Rapamcyin shows a variety of bioloigical actions. E.g it induces autophagy and apoptosis.

Promotes hPSC differentiation to blood progenitor and mesendoderm cells.

It can also be used in inducible CRISPR/Cas9 systems to enable inducible gene editing.

Used as a chemical dimerizer in Chemically-inducible dimerization (CID).

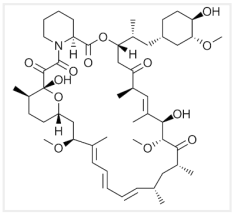
As mTOR is a central inflammation regulator, rapamycin has recently been investigated as part of cytokine storm / COVID-19 related research.

Solubility & Handling

Storage instructions	-20°C
Solubility overview	Soluble in ethanol (20 mM) and DMSO (50 mM)
Important	This product is for RESEARCH USE ONLY and is not intended for therapeutic or diagnostic use. Not for human or veterinary use.

Chemical Data

Chemical name	(3S,6R,7E,9R,10R,12R,14S,15E,17E,19E,21S,23S,26R,27R,34aS)-9,10,12,13,14,21,22,23,24,25,26,27,32,33,34,34a-Hexadecahydro-9,27-dihydroxy-3-[(1R)-2-[(1S,3R,4R)-4-hydroxy-3-methoxycyclohexyl]-1-methylethyl]-10,21-dimethoxy-6,8,12,14,20,26-hexamethyl-23,27-epoxy-3H-pyrido[2,1-c][1,4]oxaazacyclohentriacontine-1,5,11,28,29(4H,6H,31H)-pentone

Molecular Weight	914.18
Chemical structure	
Molecular Formula	$C_{51}H_{79}NO_{13}$
CAS Number	53123-88-9
PubChem identifier	5284616
SMILES	C[C@@H]1CC[C@H]2C[C@@H](/C(=C/C=C/C=C/[C@H](C[C@H](C(=O)[C@@H]([C@@H](/C(=C/[C@H](C(=O)C[C@H](OC(=O)[C@@H]3CCCCN3C(=O)C(=O)[C@@]1(O2)O)[C@H](C)C[C@@H]4CC[C@H]([C@@H](C4)OC)O)C)/C)O)OC)C)C)/C)OC
InChiKey	QFJCIRLUMZQUOT-HPLJOQBZSA-N
MDL number	MFCD00867594
Appearance	White to off-white

References

Rapamycin, a specific inhibitor of the mammalian target of rapamycin, suppresses lymphangiogenesis and lymphatic metastasis.

Kobayashi et al (2007) Cancer Sci 98(5)
PubMedID 17425689

Rapamycins: mechanism of action and cellular resistance.

Huang et al (2003) Cancer Biol Ther 2(3)
PubMedID 12878853

Chemical modulators of autophagy as biological probes and potential therapeutics.

Flemin et al (2011) Nat Chem Biol 7(1)
PubMedID 21164513

A split-Cas9 architecture for inducible genome editing and transcription modulation.

Zetsche et al (2015) Nat Biotechnol 33(2)
PubMedID 25643054

Targeting T-cell senescence and cytokine storm with rapamycin to prevent severe progression in COVID-19

Mahe et al (2020) Clin Immunol. 216
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