Product Data Sheet

Chemical Properties

Product Name: Rapamycin (Sirolimus)
Cas No.: 53123-88-9
M.Wt: 914.18
Formula: C51H79NO13
Synonyms: Sirolimus,(-)-Rapamycin, AY-22989, WY-090217, Antibiotic AY22989
Chemical Name: N/A
Canonical SMILES: O[C@H]1[C@H](OC)[C@@H](C[C@@H](C)[C@@H](CC[[C@@H](C)/C=C( C)/[C@@H]([C@@H]OC)(C)[C@@H]((C[C@@H](/C=C/C=C/C=C(C)/[C@ H](OC)C[C@@H]2CC[C@@H](C)[C@@H]((C(N3[C@H]4CCCC3)=O)=O)(O)O2)C)C)=O)=O)OC4=O)CC1
Solubility: ≥45.709mg/mL in DMSO
Storage: Desiccate at -20° C
General tips: For obtaining a higher solubility, please warm the tube at 37° C and shake it in the ultrasonic bath for a while. Stock solution can be stored below -20° C for several months.
Shopping Condition: Evaluation sample solution: ship with blue ice
All other available size: ship with RT, or blue ice upon request

Biological Activity

Targets: PI3K/Akt/mTOR Signaling
Pathways: mTOR
Description: Rapamycin was used as a kind of original antifungal antibiotic, which is produced by Streptomyces hygroscopicus. Now it has been used in the prevention of transplant rejection.
because of its immunosuppressive effect. It also exhibits activity against several transplantable tumors and slightly activity to inactive against leukemias. The immunosuppressive effect of Rapamycin is exerted by inhibiting the activation and proliferation of T cells. Rapamycin binds to FK-binding protein 12 (FKBP12) and forms the rapamycin-FKBP12 complex, which regulates an enzyme that plays an important role in the progression of the cell cycle.

Reference:

Protocol

Cell experiment:

Cell lines
Hepatocyte growth factor (HGF)-induced lens epithelial cells (LECs)

Preparation method
The solubility of this compound in DMSO is >10 mM. General tips for obtaining a higher concentration: Please warm the tube at 37 °C for 10 minutes and/or shake it in the ultrasonic bath for a while. Stock solution can be stored below -20°C for several months.

Reacting conditions
10 ng/ml, 72h

Applications
Using cell proliferation, cell viability and flow cytometric apoptosis assays, we found that rapamycin potently not only suppressed proliferation but also induced the apoptosis of LECs in a dose-dependent manner under HGF administration. Further investigation of the underlying mechanism using siRNA transfection revealed that rapamycin could promote apoptosis of LECs via inhibiting HGF-induced phosphorylation of AKT/mTOR, ERK and JAK2/STAT3 signaling molecules. Moreover, the forced expression of AKT, ERK and STAT3 could induce a significant suppression of apoptosis in these cells after treatment of rapamycin.

Animal experiment [3]:

Animal models
Ndufs4(-/-) mice

Dosage form
8 mg/kg every other day, intraperitoneal injection

Applications
Rapamycin, a specific inhibitor of the mechanistic target of rapamycin (mTOR) signaling pathway, robustly enhances survival
and attenuates disease progression in a mouse model of Leigh syndrome. Administration of rapamycin to these mice, which are deficient in the mitochondrial respiratory chain subunit Ndufs4 [NADH dehydrogenase (ubiquinone) Fe-S protein 4], delays onset of neurological symptoms, reduces neuroinflammation, and prevents brain lesions. Although the precise mechanism of rescue remains to be determined, rapamycin induces a metabolic shift toward amino acid catabolism and away from glycolysis, alleviating the buildup of glycolytic intermediates. This therapeutic strategy may prove relevant for a broad range of mitochondrial diseases.

Other notes
Please test the solubility of all compounds indoor, and the actual solubility may slightly differ with the theoretical value. This is caused by an experimental system error and it is normal.

Reference:

Product Citations


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**Caution**

**FOR RESEARCH PURPOSES ONLY.**

**NOT FOR HUMAN, VETERINARY DIAGNOSTIC OR THERAPEUTIC USE.**

Specific storage and handling information for each product is indicated on the product datasheet. Most ApexBio products are stable under the recommended conditions. Products are sometimes shipped at a temperature that differs from the recommended storage temperature. Short-term storage of many products are stable in the short-term at temperatures that differ from that required for long-term storage. We ensure that the product is shipped under conditions that will maintain the quality of the reagents. Upon receipt of the product, follow the storage recommendations on the product data sheet.

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