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Product Information

Tunicamycin
from *Streptomyces* sp.

Catalog Number **T7765**
Storage Temperature 2–8 °C

CAS RN 11089-65-9

Product Description

Molecular weight:[1]
- Homolog A = 817
- Homolog B = 831
- Homolog C = 845
- Homolog D = 859

Spectral properties:[2]
- λ_{max}: 205 nm, 260 nm
- Extinction coefficients: $E^{1\%}$ = 230, 110; E^{mM} = 22, 9 (methanol)

Tunicamycin is a mixture of homologous antibiotics which contain uracil, N-acetyl glycosamine, an 11-carbon aminodialdose called tunicamine, and a fatty acid linked to the amino group. There are at least 10 homologs, the main components being A, B, C, and D.[2] The homologs differ in their fatty acid components, which vary the chain length.[1,3-5] Homologs A1, A2, B1, and C2 inhibit N-linked glycosylation of lipids at 1–2 μg/ml, while homologs B2, C1, D1, and D2 require 5 μg/ml to achieve the same amount of inhibition. Homologs A1, B2, and C2 do not inhibit protein synthesis up to 100 ng/ml; whereas, homologs A2, B1, C1, D1, and D2 markedly inhibit tyrosine incorporation at <50 ng/ml.[6]

Tunicamycin is an inhibitor of bacterial and eukaryote N-acetylglucosamine transferases; preventing formation of N-acetylglucosamine lipid intermediates and glycosylation of newly synthesized glycoproteins.[7] Tunicamycin blocks the formation of protein N-glycosidic linkages by inhibiting the transfer of N-acetylglycosamine 1-phosphate to dilichol monophosphate.[8] Several reviews have been written on the effects of tunicamycin on glycoproteins.[9,10]

Tunicamycin will enhance the activity of interferon.[11] It is also an inhibitor of ceruloplasmin, α_2-macroglobulin, and α1-protease inhibitor secretion.[12]

Components

The amounts of A, B, C, and D homologs are determined for this product. Since composition will vary from lot-to-lot, actual quantites are stated on the label and Certificate of Analysis.

Precautions and Disclaimer

This product is for R&D use only, not for drug, household, or other uses. Please consult the Material Safety Data Sheet for information regarding hazards and safe handling practices.

Preparation Instructions

Tunicamycin is soluble in DMSO at 10 mg/ml yeilding a clear solution. It is soluble in excess of 10 mg/ml in DMF and pyridine. Tunicamycin is soluble at <5 mg/ml in water at pH 9.0. Tunicamycin is soluble in warm 95% ethanol at 1 mg/ml (it is not soluble at higher concentrations) yielding a clear to very faint hazy solution. The solubility in warm methanol was observed at 5 mg/ml yeilding a clear to very faint hazy solution. Tunicamycin is soluble at <1 mg/ml in dioxane and THF. It is insoluble in other organic solvents such as acetone, chloroform, and ethyl acetate, and in aqueous solutions with pH <6. Aqueous solutions can be prepared from stock solutions by diluting with water at pH 8–10 or with buffers with pH >7, preferably >8. It will not dissolve in phosphate buffer, pH 8, at 1 mg/ml, even with heating, but solubility can be achieved by raising the pH to 9 and back titrating to pH 7–8.

Storage/Stability

Store the product at 2–8 °C. Stored properly, the product remains active for at least 3 years.

Tunicamycin is unstable in acid solutions, but stable at alkaline pH.[4] When dissolved in water at 100 °C and held for 30 minutes, it is stable at neutral and alkaline pH, and unstable at acidic pH.[2]

References

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