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ProductInformation

Tunicamycin
from *Streptomyces sp.*

Product Numbers **T7765, T1152, T0527**

Product Description

Tunicamycin is a mixture of homologous antibiotics which contain the following common building blocks: uracil, N-acetyl glycosamine, an 11-carbon aminodialdose called tunicamine and a fatty acid linked to the amino group. Tunicamycin is an inhibitor of bacterial and eukaryote N-acetylglucosamine transferases; preventing formation of N-acetyl-glucosamine lipid intermediates and glycosylation of newly synthesized glycoproteins.[1] It blocks the formation of protein N-glycosidic linkages by inhibiting the transfer of N-acetylglycosamine 1-phosphate to dolichylmonophosphate.[2] It enhanced the activity of interferon[3] and has been shown to inhibit 99% of replication of Vesticular Stomatitis virus in mammalian cells at 0.5 µg/ml. Tunicamycin is also an inhibitor of ceruloplasmin, of α2-macroglobulin, and of the secretion of α1-protease inhibitor.[4] It has been shown that tunicamycin induced a programmed cell death in plant cells[5] and in mammalian cells via stimuli of ER stress.[6]

There are at least 10 homologs, the main components being A, B, C, and D.[7] The homologs differ in their fatty acid components, which vary in chain length.[7,8,9,10] 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, at up to 100 ng/ml, whereas homologs A2, B1, C1, D1, and D2 markedly inhibit tyrosine incorporation at less than 50 ng/ml.[11]

Precautions and Disclaimer

These products are 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 excess of 10 mg/ml in DMF, DMSO, and pyridine. It is soluble at less than 5 mg/ml in water at pH = 9.0, warm methanol, and warm 95% ethanol. It is soluble at less than 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 less than 6. Aqueous solutions can be prepared from stock solutions by diluting with water at pH 8-10 or with buffers with pH above 7, preferably greater than 8. It will not dissolve directly 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 to 8.

Storage/Stability

The products are stable for 3 years if stored at the recommended temperature. Tunicamycin is unstable in acid solutions, but stable at alkaline pH.[10]

T7765 Tunicamycin

This product is the mixture of homologous antibiotics, A, B, C and D
Molecular weights: A = 817, B = 831, C = 845, D = 859[7]
Storage Temperature 2-8 °C

CAS RN: (for the complex of homologs): 11089-65-9

Melting Point: 234 - 235 °C with decomposition [12]
λ_{max}: 205 nm, 260 nm; (methanol)
($E^{1\%}_{1cm}$ = 230, 110) [12]
$[\alpha]^{20}_{D}$: +52° (c = 0.5 in pyridine) [12]

Sigma determines the amounts of A, B, C, and D homologs in the product. Composition may vary from lot to lot and actual content is given on the label.

T1152 C2 homolog

Purity 95% (HPLC)
Storage Temperature –20 °C

CAS RN: 73942-07-1

Molecular formula: $C_{39}H_{64}N_4O_{16}$
Molecular weight: 844.94

T0527 A1 homolog
Purity 95% (HPLC)
Storage Temperature –20 °C

CAS RN: 66081-37-6

Molecular formula: $C_{37}H_{60}N_4O_{16}$
Molecular weight: 816.89

References

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NDH/PHC 12/04