

Product Information

4-Methylumbelliferyl N-acetyl- α -D-glucosaminide

Product Number **M 9881**
Storage Temperature -0°C

Product Description

Molecular Formula: $\text{C}_{18}\text{H}_{21}\text{NO}_8$
Molecular Weight: 379.4
CAS Number: 80265-04-9
Melting point: $224.5\text{--}225^{\circ}\text{C}$ ¹
Specific Rotation: $+257^{\circ}$ (0.1% in water)¹

4-Methylumbelliferyl N-acetyl- α -D-glucosaminide is a sensitive fluorogenic substrate for N-acetyl- α -D-glucosaminidase (NAGLU, EC 3.2.1.50).^{2,3} The assay of NAGLU is performed at pH 4.3. The reaction is stopped by the addition of glycine buffer, pH 10.3. Free 4-methylumbelliferone is then determined using an excitation wavelength of 360 nm and fluorescence emission at 480 nm.¹

Mucopolysaccharidosis type IIIB (MPS IIIB or Sanfilippo syndrome type B) is a lysosomal disease, due to glycosaminoglycan storage caused by mutations on the α -N-acetylglucosaminidase (NAGLU) gene causing a deficiency of NAGLU activity and defective degradation of heparan sulfate.³⁻⁷

Precautions and Disclaimer

For Laboratory Use Only. Not for drug, household or other uses.

Preparation Instructions

This product is soluble in N,N-dimethylformamide (DMF, 10 mg/ml) and pyridine:1 M HCl (1:1, 50 mg/ml) yielding a clear, colorless solution. It has been used at 0.2 mM (76 $\mu\text{g}/\text{ml}$) in 0.2 M acetate buffer, pH 4.3).²

References

1. Chow, P. and Weissmann, B., 4-Methylumbelliferyl 2-acetamido-2-deoxy- α -D-glucopyranoside, a fluorogenic substrate for N-acetyl- α -D-glucosaminidase. *Carbohydr. Res.*, **96(1)**, 87-93 (1981).
2. Marsh, J., and Fensom, A. H., 4-Methylumbelliferyl α -N-acetylglucosaminidase activity for diagnosis of Sanfilippo B disease. *Clin. Genet.*, **27(3)**, 258-262 (1985).
3. Villani, G. R., et al., Correction of mucopolysaccharidosis type IIIB fibroblasts by lentiviral vector-mediated gene transfer. *Biochem. J.*, **364(Pt 3)**, 747-753 (2002).
4. Zhao, K. W., and Neufeld, E. F., Purification and characterization of recombinant human α -N-acetylglucosaminidase secreted by Chinese hamster ovary cells. *Protein. Expr. Purif.*, **19(1)**, 202-211 (2000).
5. Yogalingam, G., et al., Mucopolysaccharidosis type IIIB: characterisation and expression of wild-type and mutant recombinant α -N-acetylglucosaminidase and relationship with Sanfilippo phenotype in an attenuated patient. *Biochim. Biophys. Acta.*, **1502(3)**, 415-425 (2000).
6. Ohmi, K., et al., Activated microglia in cortex of mouse models of mucopolysaccharidoses I and IIIB. *Proc. Natl. Acad. Sci. U.S.A.*, **100(4)**, 1902-1918 (2003).
7. Constantopoulos, G., et al., Neurochemistry of the mucopolysaccharidoses: brain glycosaminoglycans, lipids and lysosomal enzymes in mucopolysaccharidosis type III B (α -N-acetylglucosaminidase deficiency). *J. Neurochem.*, **31(5)**, 1215-1222 (1978).

Sigma brand products are sold through Sigma-Aldrich, Inc.

Sigma-Aldrich, Inc. warrants that its products conform to the information contained in this and other Sigma-Aldrich publications. Purchaser must determine the suitability of the product(s) for their particular use. Additional terms and conditions may apply. Please see reverse side of the invoice or packing slip.

