Product Information

β-Glucuronidase from limpets (*Patella vulgata*)

Type L-II, lyophilized powder, 1,000,000-3,000,000 units/g solid

G8132

Product Description

CAS Registry Number: 9001-45-0

Enzyme Commission (EC) Number: 3.2.1.31

Synonyms: β-D-Glucuronide glucuronosohydrolase

Glucuronidation, or conjugation with glucuronic acid, by the human UDP-glucuronosyltransferase (UGT) family of enzymes plays an important role in the metabolic fate of many drugs and other xenobiotics. This biosynthetic reaction also has a role in the conjugation and excretion of endogenous substrates, such as steroids, bilirubin, and bile acids.[1] UGT activity results in the conjugation of glucuronic acid to substrates that contain sulfhydryl, hydroxyl, aromatic amino, or carboxylic acid moieties. The resulting glucuronides are more polar (water-soluble) than the parent organic substrate and are generally excreted through the kidney.

β-glucuronidase catalyzes the general reaction:

β-D-glucuronoside + H_2O ↔
an alcohol + D-glucuronate

β-Glucuronidase Type L-II is useful for the hydrolysis of drug-glucuronides from urine.[2,3] This enzyme preparation was found to be cost-effective and thermostable, and can be used at a temperature high enough to allow for a shorter incubation time compared to the enzyme from snail or bovine.[2] Although the exact amount needed will depend on the specific conditions used and must be determined empirically, complete hydrolysis of morphine glucuronide was reported following a 3-hour incubation at 65 °C with 5,000 units of the enzyme per mL of urine.[2] Another report found the optimal conditions for hydrolysis of conjugated steroid metabolites to be a one-hour incubation at 55 °C at pH 5.2, using 600 units of enzyme per mL of urine.[4]

β-Glucuronidase Type L-II from keyhole limpet is a crude solution of enzymes. Many β-glucuronidases derived from mollusks also contain sulfatase activity. For this reason, sulfatase activity is also determined.

Several publications[5-11] theses,[12] and dissertations[13,14] have cited use of product G8132 in their protocols.

Optimal pH

- Glucuronidase activity: 4.5 to 5.0
- Sulfatase activity: ~6.2

Inhibitors

- D-glucuronic acid (Cat. No. G5269)
- D-galacturonic acid (Cat. No. 48280)
- D-glucaro-1,4-lactone

Substrates

- 5-Bromo-6-chloro-3-indolyl β-D-glucuronide (Cat. No. B4532)
- 6-Bromo-2-naphthyl β-D-glucuronide (Cat. No. B7877)
- 5-Bromo-4-chloro-3-indolyl β-D-glucuronide sodium salt tablet (Cat. No. B8174)
- 8-Hydroxyquinoline glucuronide sodium salt (Cat. No. 38153)
- 4-Methylumbelliferyl β-D-glucuronide (Cat. No. M9130)
- 4-Nitrophenyl β-D-glucuronide (Cat. Nos. N1627, 73677)

Glucuronidase Activity

1,000,000–3,000,000 units per gram solid

Unit Definition: One Sigma or modified Fishman unit will liberate 1.0 µg of phenolphthalein from phenolphthalein glucuronide per hour at 37 °C at pH 5.0 (30-minute assay).

Sulfatase Activity

Reported on the Certificate of Analysis (CofA)

Unit Definition: One unit of sulfatase will hydrolyze 1.0 µmole of *p*-nitrocatechol sulfate per hour at pH 5.0 at 37 °C.

Precautions and Disclaimer

For R&D use only. Not for drug, household, or other uses. Please consult the Safety Data Sheet for information regarding hazards and safe handling practices.

Storage/Stability

Store the product at –20 °C. When stored at –20 °C, the enzyme retains activity for at least 3 years.

References

1. Tephly, T.R. *et al.*, *Adv. Pharmacol.*, **42**, 343-346 (1998).
2. Combie, J. *et al.*, *Clin. Chem.*, **28(1)**, 83-86 (1982).
3. Combie, J. *et al.*, *Res. Commun. Chem. Pathol. Pharmacol.*, **35(1)**, 27-41 (1982).
4. Ferchaud, V. *et al.*, *Analyst*, **125(12)**, 2255-2259 (2000).
5. Vree, T.B. *et al.*, *J. Chromatogr. B Biomed. Appl.*, **670(1)**, 111-123 (1995).
6. Soriano, T. *et al.*, *J. Anal. Toxicol.*, **25(2)**, 137-143 (2001).
7. Feng, S. *et al.*, *J. Anal. Toxicol.*, **25(7)**, 589-593 (2001).
8. ElSohly, M.A. *et al.*, *J. Anal. Toxicol.*, **29(6)**, 570-573 (2005).
9. West, R. *et al.*, *Pain Physician*, **13(3)**, 71-78 (2010).
10. Pesce, A. *et al.*, *Pain Physician*, **13(3)**, 283-287 (2010).
11. Liu, J.C. *et al.*, *J. Anal. Toxicol.*, **38(4)**, 212-217 (2014).
12. Padgett, Ashley Loren, "Comparison of Transdermal Fentanyl and Intramuscularly Administered Buprenorphine for Postoperative Pain in Pregnant Sheep". Texas A&M University, M.S. thesis, p. 26 (2018).
13. Schoondermark-van de Ven, Esther, "Toxoplasmosis: An experimental study in rhesus monkeys for prenatal diagnosis and treatment of congenital infections". Katholieke Universiteit Nijmegen, Ph.D. dissertation, p. 83 (1995).
14. van der Ven, Andreas Johannes Antoine Maria, "Adverse reactions to cotrimoxazole in HIV infection: Studies to explore the mechanism". Katholieke Universiteit Nijmegen, Ph.D. dissertation, pp. 22, 25 (1995).

Notice

We provide information and advice to our customers on application technologies and regulatory matters to the best of our knowledge and ability, but without obligation or liability. Existing laws and regulations are to be observed in all cases by our customers. This also applies in respect to any rights of third parties. Our information and advice do not relieve our customers of their own responsibility for checking the suitability of our products for the envisaged purpose.

The information in this document is subject to change without notice and should not be construed as a commitment by the manufacturing or selling entity, or an affiliate. We assume no responsibility for any errors that may appear in this document.

Technical Assistance

Visit the tech service page at SigmaAldrich.com/techservice.

Standard Warranty

The applicable warranty for the products listed in this publication may be found at SigmaAldrich.com/terms.

Contact Information

For the location of the office nearest you, go to SigmaAldrich.com/offices.

G8132dat Rev 04/22 AC,GCY,MAM