

## Product Information

## $\beta$ -Glucuronidase from limpets (*Patella vulgata*)

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

**G8132**

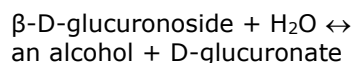
### Product Description

CAS Registry Number: 9001-45-0

Enzyme Commission (EC) Number: 3.2.1.31

Synonyms:  $\beta$ -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.<sup>1</sup> 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.

 $\beta$ -glucuronidase catalyzes the general reaction:

$\beta$ -Glucuronidase Type L-II is useful for the hydrolysis of drug-glucuronides from urine.<sup>2,3</sup> 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.<sup>2</sup> 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.<sup>2</sup> 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.<sup>4</sup>

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

Several publications<sup>5-11</sup> theses,<sup>12</sup> and dissertations<sup>13,14</sup> 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  $\beta$ -D-glucuronide (Cat. No. B4532)
- 6-Bromo-2-naphthyl  $\beta$ -D-glucuronide (Cat. No. B7877)
- 5-Bromo-4-chloro-3-indolyl  $\beta$ -D-glucuronide sodium salt tablet (Cat. No. B8174)
- 8-Hydroxyquinoline glucuronide sodium salt (Cat. No. 38153)
- 4-Methylumbelliferyl  $\beta$ -D-glucuronide (Cat. No. M9130)
- 4-Nitrophenyl  $\beta$ -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  $\mu\text{g}$  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  $\mu\text{mole}$  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

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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).
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