

## Product Information

### Peptidoglycan from *Bacillus subtilis*

Catalog Number **69554**

Storage Temperature  $-20\text{ }^{\circ}\text{C}$

#### Product Description

Many bacteria contain in their cell walls a unique biopolymer, peptidoglycan, which lends rigidity to the cell wall and mechanical strength to the cell. Cell walls of Gram-positive bacteria are largely composed of peptidoglycan, and can contain up to 40 layers of this polymer, which underlies the great mechanical strength of the cell wall. The core structure of peptidoglycan is a carbohydrate backbone of alternating units of *N*-acetylglucosamine (GlcNAc) and *N*-acetyl muramic acid (MurNAc), linked by  $\beta(1\rightarrow4)$  bonds. The MurNAc residues are crosslinked with oligopeptides. A unique aspect of peptidoglycans is that they contain D-amino acids, e.g. D-Ala and D-Glu, the only known biological molecule that contains D-amino acids.<sup>1,2</sup>

Peptidoglycans in various *Bacillus* species can have chain lengths in the range of 50–250 disaccharide units.<sup>2</sup> Various publications have studied the structure and architecture of the *Bacillus subtilis* cell wall peptidoglycan.<sup>3-7</sup>

Several publications cite use of this product in various applications and systems, including preparation of novel biopolymers,<sup>8</sup> fluorescence studies,<sup>9</sup> ELISA,<sup>10</sup> and binding assays,<sup>11</sup> and studies on caterpillars<sup>12</sup> and sea anenomes.<sup>13</sup>

#### 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.

#### Preparation Instructions

One publication has reported suspension of this product in PBS at  $2\text{ }\mu\text{g}/100\text{ }\mu\text{L}$ .<sup>8</sup> However, we have not tested this situation ourselves.

#### References

1. Schleifer, K.H., and Kandler, O., *Bact. Rev.*, **36(4)**, 407-477 (1972).
2. Vollmer, W. *et al.*, *FEMS Microbiol. Rev.*, **32(2)**, 149-167 (2008).
3. Warth, A.D., and Strominger, J.L., *Biochemistry*, **11(8)**, 1389-1396 (1972).
4. Popham, D.L. *et al.*, *J. Bacteriol.*, **178(22)**, 6451-6458 (1996).
5. Hayhurst, E.J. *et al.*, *Proc. Nat. Acad. Sci. USA*, **105(38)**, 14603-14608 (2008).
6. Davies, Ashley, Peptidoglycan architecture and dynamics in *Bacillus subtilis*. University of Sheffield, Department of Molecular Biology and Biotechnology, Ph.D. dissertation (September 2014).
7. Angeles, D.M. *et al.*, *Mol. Microbiol.*, **104(2)**, 319-333 (2017).
8. Chen, N. *et al.*, *Macromol. Chem. Phys.*, **213(24)**, 2647-2652 (2012).
9. Manuse, S. *et al.*, *Nat. Commun.*, **7**, 12071 (2016).
10. Lun, C.M. *et al.*, *Immunobiology*, **221(8)**, 889-903 (2016).
11. Qi, Z. *et al.*, *Oncotarget*, **8(59)**, 99323-99335 (2017).
12. Celorio-Mancera, M. de la Paz *et al.*, *Insect Biochem. Mol. Biol.*, **61**, 34-45 (2015).
13. Nicosia, A. *et al.*, *Genes* (Basel), **9(1)**, E30 (doi.org/10.3390/genes9010030) (2018).

GCY,MAM 11/19-2