

## Product Information

### Surfactin from *Bacillus subtilis*

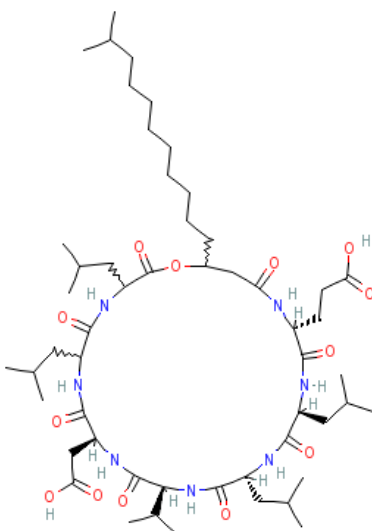
Catalog Number **S3523**  
Storage Temperature 2–8 °C

CAS RN: 24730-31-2

#### Product Description

Molecular Formula: C<sub>53</sub>H<sub>93</sub>N<sub>7</sub>O<sub>13</sub>

Molecular Weight: 1036.34



Surfactin, produced by various *Bacillus subtilis* strains, is a cyclic lipopeptide built from a heptapeptide and a  $\beta$ -hydroxy fatty acid with variable chain lengths of 13–15 carbon atoms.<sup>1,2</sup> Surfactin actually is a mixture of lipopeptides, differing mostly in the fatty acid substitutions.<sup>2</sup> Concentrations as low as 0.005% of surfactin reduce the surface tension to 27 mN/m, making it one of the most powerful biosurfactants.<sup>3</sup> It was shown to enhance the biodegradation of waste and pesticides such as endosulfan.<sup>3</sup> Because of the presence of two negative charges, one on the aspartate and the other on the glutamate residues, surfactin is able to bind and remove metals from contaminated soil.<sup>3</sup>

Surfactin was shown to cause damage to the plasma membrane and depolarization of mitochondria at concentrations of 5000 ng/ml.<sup>4</sup> This biosurfactant possesses antifungal and antibacterial activity, inhibits fibrin clot formation, induces formation of ion channels in lipid bilayer membranes, inhibits cyclic adenosine monophosphate (cAMP), inhibits platelet and spleen cytosolic phospholipase A2 (PLA2), and exhibits antitumor activities.<sup>5,6</sup> Surfactin is also active against several viruses including semliki forest virus, herpes simplex virus, simian immunodeficiency virus, feline calicivirus, and murine encephalomyocarditis virus.<sup>6</sup> Its biosurfactant properties make it a useful inhibitor of bacterial-biofilm formation in vinyl urethral catheters.<sup>6</sup>

Purity:  $\geq$ 98% (HPLC)

#### Precautions and Disclaimer

This product is 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

Soluble in ethanol (10 mg/ml) and in methanol.

#### Storage/Stability

Store at 2–8 °C. Stable for 3 years under these conditions.

#### References

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2. Oka, K. et al., Satisfactory separation and MS-MS spectrometry of six surfactins isolated from *Bacillus subtilis natto*. *Chem. Pharm. Bull.*, **41**, 1000-1002 (1993).

3. Mulligan, C. N., Environmental applications for biosurfactants. *Env. Pol.*, **133**, 183-198 (2005).
4. Hoornstra, D. et al., A new method for *in vitro* detection of microbially produced mitochondrial toxins. *Tox. in Vit.*, **17**, 745-751 (2003).
5. Kim, K. et al., Suppression of inflammatory response by surfactin, a selective inhibitor of platelet cytosolic phospholipase A<sub>2</sub>. *Biochem. Pharmacol.*, **55**, 975-985 (1998).
6. Singh, P. and Cameotra S. S., Potential applications of microbial surfactants in biomedical sciences. *Trends in Biotech.*, **22**, 142-146 (2004).

DS,EM,PHC,MAM 12/17-1