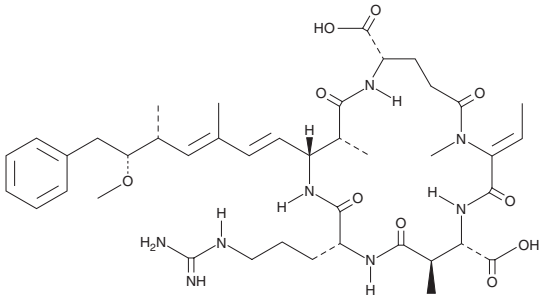
PRODUCT INFORMATION

Nodularin

Item No. 10007190

CAS Registry No.: 118399-22-7
Formal Name: cyclo[3S-amino-9S-methoxy-2S,6E,8S-trimethyl-10-phenyl-4,6-decadienoyl-D-γ-glutamyl-(2Z)-2-(methylamino)-2-butenoyl-(3S)-3-methyl-D-β-aspartyl-L-arginyl]
MF: $C_{41}H_{60}N_8O_{10}$
FW: 825.0
Purity: ≥95%
Supplied as: A clear film
Storage: -20°C
Stability: ≥4 years



Information represents the product specifications. Batch specific analytical results are provided on each certificate of analysis.

Laboratory Procedures

Nodularin is supplied as a clear film. A stock solution may be made by dissolving the nodularin in the solvent of choice, which should be purged with an inert gas. Nodularin is soluble in organic solvents such as ethanol and DMSO. The solubility of nodularin in these solvents is approximately 10 mg/ml.

Nodularin is sparingly soluble in aqueous buffers. For maximum solubility in aqueous buffers, nodularin should first be dissolved in methanol and then diluted with the aqueous buffer of choice. Nodularin has a solubility of approximately 1 mg/ml in a 1:1 solution of methanol:water using this method. We do not recommend storing the aqueous solution for more than one day.

Description

Nodularin is a cyanotoxin and an inhibitor of protein phosphatase 2A (PP2A; IC_{50} = 0.021 nM).[1,2] It is selective for PP2A over PP1 and PP2B (IC_{50}s = 2.1 and 8,700 nM, respectively), as well as alkaline phosphatase (ALP), acid phosphatase, protein kinase A (PKA), PKC, and phosphorylase kinase at 1 µM. Nodularin (25 µg/kg) decreases serum and testis testosterone levels, increases serum cholesterol levels, and induces apoptosis in spermatogonia and the prostate in male mice when used in combination with the carcinogen diethylnitrosamine in a model of hepatocarcinogenesis.[3] It induces enlargement of hepatic tubules, distortion of the hepatic tubule epithelium, and exfoliation of the intestinal epithelium, as well as increases malondialdehyde (MDA) levels and the activity of superoxide dismutase (SOD), catalase (CAT), and peroxidase in the hepatopancreas and intestine in Pacific white shrimp (*L. vannamei*) when used at a concentration of 1 µg/L.[1] It has been found in lakes with cyanobacterial mats and in Baltic fish.[4,5]

References

1. Duan, Y., Xing, Y., Huang, J., *et al.* Toxicological response of pacific white shrimp *Litopenaeus vannamei* to a hazardous cyanotoxin nodularin exposure. *Environ. Pollut.* **318**, 120950 (2023).
2. Honkanen, R.E., Dukelow, M., Zwiller, J., *et al.* Cyanobacterial nodularin is a potent inhibitor of type 1 and type 2A protein phosphatases. *Mol. Pharmacol.* **40(4)**, 577-583 (1991).
3. Park, T.J., Song, K.Y., Sohn, S.H., *et al.* Marked inhibition of testosterone biosynthesis by the hepatotoxin nodularin due to apoptosis of leydig cells. *Mol. Carcinog.* **34(3)**, 151-163 (2002).
4. Mountfort, D.O., Holland, P., and Sprosen, J. Method for detecting classes of microcystins by combination of protein phosphatase inhibition assay and ELISA: Comparison with LC-MS. *Toxicon* **45(2)**, 199-206 (2005).
5. Sipiä, V.O., Kankaanpää, H.T., Lahti, K., et al. Detection of nodularin in flounders and cod from the Baltic Sea. *Environ. Toxicol.* **16(2)**, 121-126 (2001).

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