

Laminarin

Soluble beta-glucan from *Laminaria digitata*; Dectin-1 ligand

Catalog code: ttrl-lam

<http://www.invivogen.com/laminarin>

For research use only

Version # 18A10-MM

PRODUCT INFORMATION

Contents:

100 mg laminarin provided as a powder

Storage and stability:

- Laminarin is shipped at room temperature. Store at 15-25°C.
- Upon resuspension, laminarin is stable for at least 1 month at 2-8°C when properly stored.

Quality control:

- The inhibitory and stimulatory activities are tested using HEK-Blue™ hDectin-1b cells and HEK-Blue™ hDectin-1a cells, respectively.
- The absence of endotoxin contamination is confirmed using HEK-Blue™ TLR4 cells.
- The presence of other bacterial contamination (e.g. lipoproteins) is assessed using HEK-Blue™ TLR2 cells. Some batch-to-batch variation may occur, which may result in TLR2 activity.

DESCRIPTION

Laminarin from the brown seaweed *Laminaria digitata* is a linear $\beta(1-3)$ -glucan with $\beta(1-6)$ -linkages. Laminarin is a low molecular weight (6 kDa), water-soluble β -glucan that can act either as a Dectin-1 antagonist or agonist¹. It can bind to Dectin-1 without stimulating downstream signaling and is able to block binding to Dectin-1 of particulate $\beta(1-3)$ -glucans, such as zymosan^{2,3}. The activity of laminarin on Dectin-1 seems to vary depending on the purity of the laminarin preparation and the Dectin-1 isoform used^{1,4}. Cells expressing the human Dectin-1b isoform do not respond to laminarin, whereas cells expressing the human Dectin-1a isoform are highly responsive to laminarin⁴. The laminarin preparation provided by InvivoGen contains no detectable levels of endotoxin unlike other commercially available preparations¹.

1. Smith AJ, et al., 2017. Immunoregulatory Activity of the Natural Product Laminarin Varies Widely as a Result of Its Physical Properties. *J Immunol.* 200(2):788-799.
2. Goodridge HS, et al., 2011. Activation of the innate immune receptor Dectin-1 upon formation of a 'phagocytic synapse'. *Nature.* 472(7344):471-5.
3. Rothfuchs AG, et al., 2007. Dectin-1 Interaction with *Mycobacterium tuberculosis* Leads to Enhanced IL-12p40 Production by Splenic Dendritic Cells. *J Immunol.* 179(6):3463-71.
4. InvivoGen Insight. Summer 2013. <http://www.invivogen.com/newsletters.php>

CHEMICAL PROPERTIES

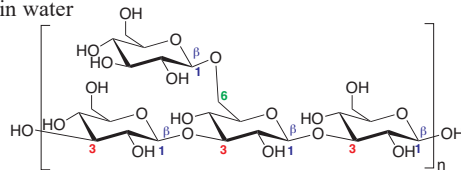
CAS number: 9008-22-4

Synonym: $\beta(1\rightarrow3, 1\rightarrow6)$ -glucan

Appearance: Off-white to slightly brown powder

Solubility: 20 mg/ml in water

Partial Structure:



TECHNICAL SUPPORT

InvivoGen USA (Toll-Free): 888-457-5873

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METHODS

Preparation of laminarin stock solution (10 mg/ml)

- Weigh 10 mg of laminarin.
 - Add 1 ml of water to the 10 mg of laminarin. Vortex to homogenize.
- Note:* Rehydration of laminarin provides a clear faintly yellow solution.

Working concentration: 1-100 μ g/ml

Blocking Dectin-1b activity using laminarin

Laminarin can be used to block Dectin-1b activity in cells expressing Dectin-1b, such as the HEK-Blue™ hDectin-1b cells. These HEK293 cells were transfected with the human Dectin-1b gene and other genes from the Dectin-1 signaling pathway. These cells also stably express a secreted embryonic alkaline phosphatase (SEAP) reporter gene. For more information visit: <http://www.invivogen.com/hek-blue-hdectin1b>

- Add 20 μ l of laminarin (1-100 μ g/ml) in a well of a 96-well plate.
- Add 160 μ l of HEK-Blue™ hDectin-1b cells (5×10^5 cells) per well.
- Incubate cells and laminarin for 1 h at 37°C, 5% CO₂.
- Stimulate cells with 20 μ l of a dectin-1 agonist (e.g. Zymosan, 1-10 μ g/ml) for 16-24 h at 37°C, 5% CO₂.
- Determine inhibition of Dectin-1b activation by assessing SEAP expression using a SEAP detection medium, such as QUANTI-Blue™.

Activating Dectin-1a using laminarin

Laminarin can be used to activate Dectin-1a in cells expressing Dectin-1a, such as the HEK-Blue™ hDectin-1a cells. These HEK293 cells were transfected with the human Dectin-1a gene and other genes from the Dectin-1 signaling pathway. These cells also stably express a secreted embryonic alkaline phosphatase (SEAP) reporter gene. For more information visit: <http://www.invivogen.com/hek-blue-hdectin1a>

- Add 20 μ l of laminarin (1-100 μ g/ml) in a well of a 96-well plate.
- Add 180 μ l of HEK-Blue™ hDectin-1a cells (5×10^5 cells) per well.
- Incubate cells and laminarin for 16-24 h at 37°C, 5% CO₂.
- Determine of Dectin-1a activation by assessing SEAP expression using a SEAP detection medium, such as QUANTI-Blue™.

RELATED PRODUCTS

Product	Catalog Code
HEK-Blue™ hDectin-1a	hkb-hdect1a
HEK-Blue™ hDectin-1b	hkb-hdect1b
QUANTI-Blue™	rep-qb1
Other Dectin-1 ligands:	
Beta-glucan peptide	ttrl-bgp
Curdlan AL	ttrl-curd
Zymosan	ttrl-zyn