

An innovative tool for organoid culture!

Recombinant Human R-spondin 1

- Expression in *E. coli*
- Bioactive domain
- Act as a Wnt signal activator



Protein Background

R-spondin 1 (roof plate-specific spondin 1), also known as Cristin 3, is one of the R-spondin family members that regulates to the activation of canonical Wnt/ β -catenin signaling. In the canonical Wnt/ β -catenin signaling pathway, when Wnt binds to cell surface receptors, Fz^{*1} and LRP5/6^{*2}, intracellular β -catenin accumulates and activates the β -catenin pathway. However, in the absence of R-spondin, Fz is endocytosed by being ubiquitinated by the binding of the ubiquitin ligase RNF43^{*3}/ZNR3^{*4}, Fz on the cell membrane decreases, and Wnt/ β -catenin signals are not activated enough. Conversely, in the presence of R-spondin, RNF43/ZNR3 forms trimers with LGRs^{*5} and R-spondin and is endocytosed, making it unable to ubiquitinate Fz. As a result, Fz on the cell membrane increases, and Wnt/ β -catenin signals are strongly activated.¹⁾

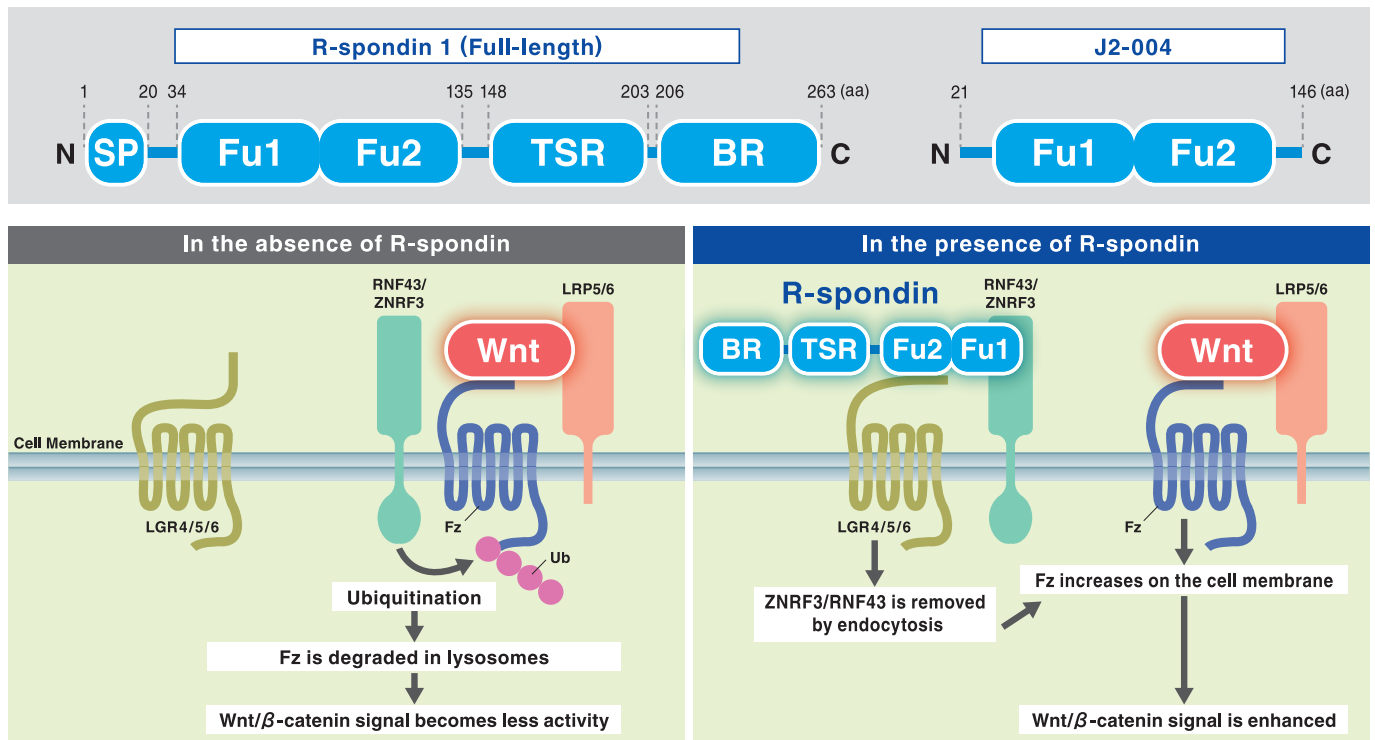
Organoid culture is typically utilized niche factors that act on Wnt, EGF, BMP and Notch signals that control stem cell differentiation. Among these signals, R-spondin 1 contributes to the activation of Wnt/ β -catenin signals as described above.

MBL's Recombinant Human R-spondin 1 (Code No. J2-004) is a protein derived from the gene encoding human R-spondin 1 (region; 21-146 aa) expressed in *E. coli*. This region contains a bioactive fragment comprising the two cysteine-rich furin-like domains (Fu1 and Fu2).

Fu1 binds to the extracellular domain of ZNR3 and RNF43, and Fu2 binds to the extracellular domain of LGR4/5/6.²⁾

*1 Frizzled, *2 low-density-lipoprotein receptor-related protein 5/6, *3 ring finger protein 43, *4 zinc and ring finger 3,

*5 leucine-rich repeat-containing G-protein coupled receptors



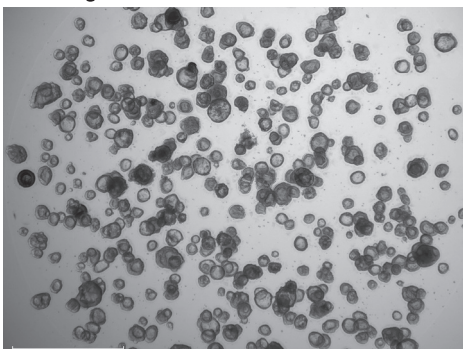
adapted from Kikuchi, A. et al. *Seikagaku*. 2020

Product Usage Example

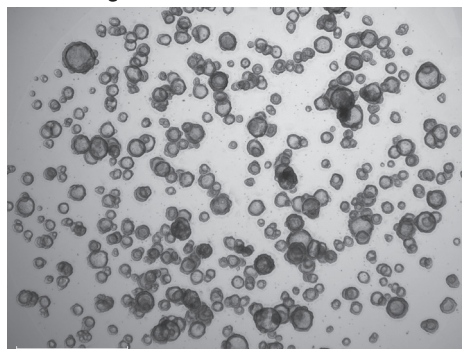
Human intestine organoid culture

Human small intestine organoids were cultured in the presence of Recombinant Human R-spondin 1 [J2-004]. As a result, it was confirmed that human small intestine organoids could be cultured under conditions in which MBL's R-spondin 1 was added at a concentration of 10 to 1000 ng/mL.

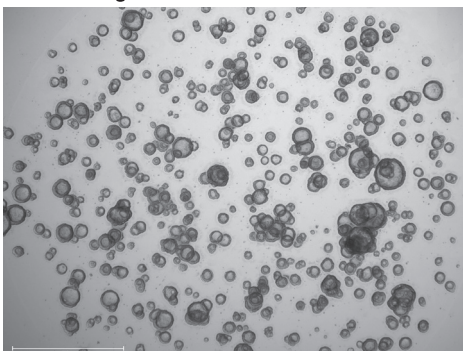
■ 10 ng/mL



■ 100 ng/mL



■ 1000 ng/mL



■ 0 ng/mL



(Scale bar; 1,250 µm)

Product Highlight

Code No.	Product name	Source	Accession No.	Form	Size
J2-004	Recombinant Human R-spondin 1	21-146 aa	Q2MKA7	Lyophilized from PBS	50 µg

References

- 1) Kikuchi, A. *et al. Seikagaku*. 2020
- 2) Gui-Xun, Shi. *et al. Prog Biophys Mol Biol*. 2016 [PMID: 27237581]

When culturing organoids, stem cells, or other tissues, if you are to use this product in combination with other factor or factors (hereunder factors), a third party may have a patent on the use or other application of the factors concerned.

Regarding to this product, we do not offer any non-infringement warranty when used or otherwise applied in combination with other factors. Therefore, if you intend to use this product in combination with other factors, please check with your organization's division responsible for intellectual property rights or your research agency before using this product.

For research use only. Not for use in diagnostic or therapeutic procedures.

The information is as of December 2024. Please contact us for the latest information. Please read the data sheets carefully before use.

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