

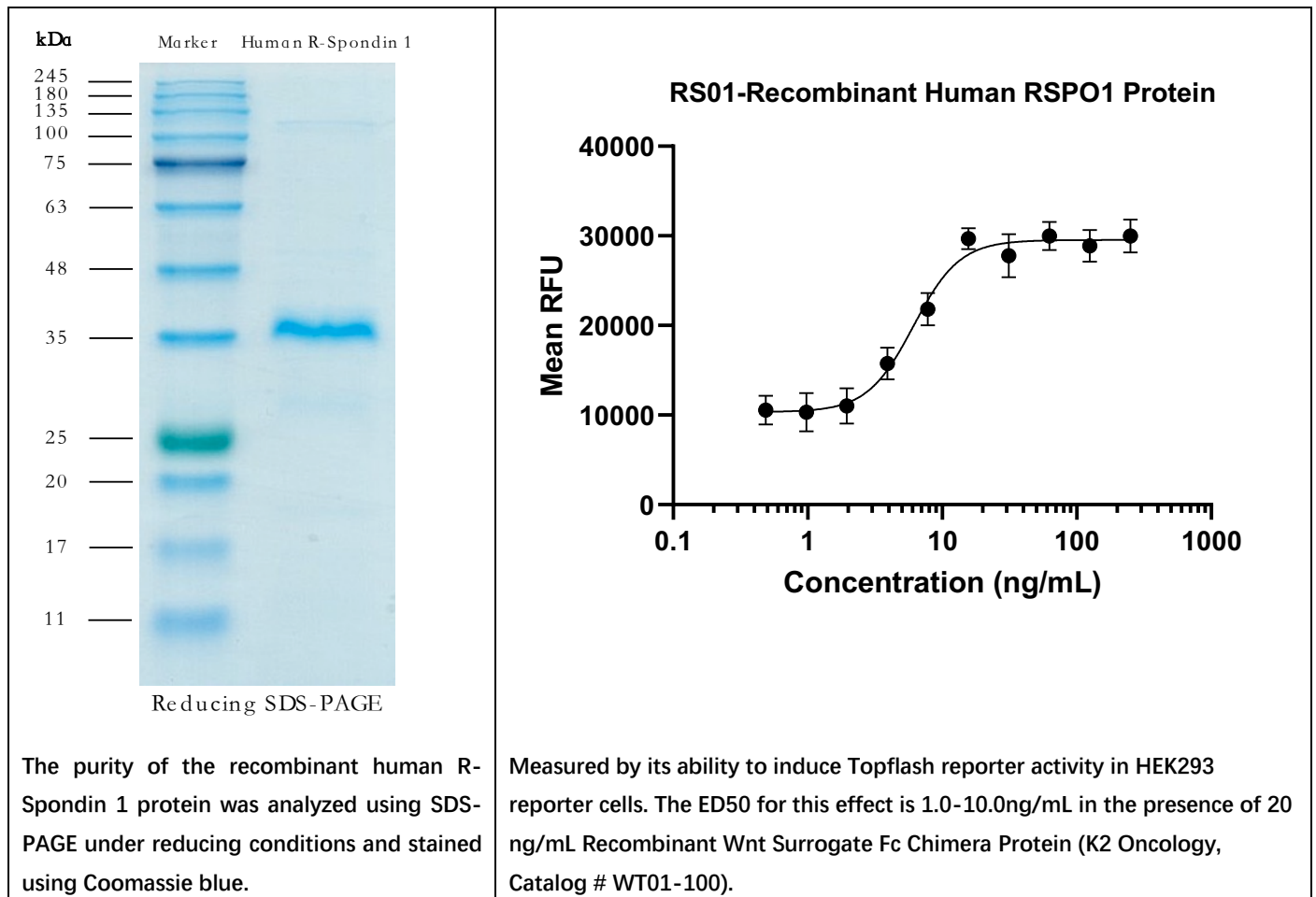
Recombinant Human R-Spondin 1 Protein

Cat. No.: RS01-100 Size: 100µg
 Cat. No.: RS01-1000 Size: 1mg

Product Specifications

Source:	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td colspan="2" style="text-align: center;">Human R-Spondin 1 (Ser21-Ala263) Accession # Q2MKA7</td> </tr> <tr> <td style="text-align: center;">N-terminus</td> <td style="text-align: center;">C-terminus</td> </tr> </table> <p>Human HEK293 cell line, HEK293-derived human R-Spondin 1 protein.</p>	Human R-Spondin 1 (Ser21-Ala263) Accession # Q2MKA7		N-terminus	C-terminus
Human R-Spondin 1 (Ser21-Ala263) Accession # Q2MKA7					
N-terminus	C-terminus				
Accession:	Q2MKA7				
Purity:	>90%, by SDS-PAGE under reducing conditions.				
Endotoxin Level:	<0.10 EU/µg of the protein by the LAL method.				
Activity:	Measured by its ability to induce Topflash reporter activity in HEK293 reporter cells. The ED ₅₀ for this effect is 0.5-5.0ng/mL in the presence of 20 ng/mL Recombinant Wnt Surrogate Fc Chimera Protein (K2 Oncology, Catalog # WT01-100).				
Organoids Culture Test:	Pass				
Structure:	Monomer				
Predicted Molecular Weight	25.6 kDa (monomer).				
SDS-PAGE	36-40 kDa, reducing conditions.				
Sterile:	0.22µm sterile filtration.				
Product Form:	Lyophilized powder.				
Shipping & Storage:	<p>The product is shipped at ambient temperature. Upon receipt, store it immediately at the temperature recommended below:</p> <ul style="list-style-type: none"> ➤ To the date of expiration, -20°C to -80°C as supplied. ➤ 3 months, -20°C to -80°C under sterile conditions after reconstitution. ➤ 1 month, 2 to 8 °C under sterile conditions after reconstitution. <p>Avoid repeated freeze-thaw cycles.</p>				

Scientific Data



Product Background:

R-Spondin 1 (RSPO1, also known as Roof plate-specific Spondin 1) is a 27 kDa secreted protein that belongs to the R-Spondin family. It shares approximately 40% amino acid identity with three other R-Spondin family members. RSPO1 regulates the Wnt/ β -Catenin signaling pathway, but its expression pattern differs from other R-Spondins.

RSPO1 competes with the Wnt antagonist DKK-1 for binding to the Wnt co-receptors, Kremen and LRP-6, thereby reducing the internalization of Kremen and LRP-6 induced by DKK-1. However, there are conflicting reports on whether RSPO1 directly binds to LRP-6.

During early development, RSPO1 is expressed at the roof plate boundary and is believed to contribute to dorsal neural tube development. In humans, disruptions of the RSPO1 gene are associated with tendencies for XX sex reversal (phenotypic male) or hermaphroditism, indicating its involvement in gender-specific differentiation. Mutations in RSPO1 are also linked to palmoplantar keratoderma, a condition characterized by abnormal thickening of the skin on the palms of the hands and soles of the feet.

In addition to its role in development, RSPO1 is expressed postnatally in various tissues, including neuroendocrine cells in the intestine, adrenal gland, and pancreas, as well as epithelial cells in the kidney and prostate. In mouse models, injection of recombinant RSPO1 activates beta-catenin and promotes proliferation of intestinal crypt epithelial cells, and it has shown potential in ameliorating experimental colitis.

Due to its biological functions, RSPO1 has gained significant interest as a cell culture supplement, particularly in the field of organoid culture. It is widely used to promote the growth and survival of 3D organoids in various organ systems.

The addition of RSPO1 to the culture medium has been shown to enhance the expansion and maintenance of various types of organoids, including intestinal, liver, and prostate organoids. RSPO1 acts by activating the Wnt/ β -Catenin signaling pathway, which is crucial for the self-renewal and proliferation of stem cells within the organoids. It promotes the survival of stem cells and maintains their undifferentiated state, leading to the long-term growth and stability of the organoids.

Structurally, RSPO1 contains two adjacent cysteine-rich furin-like domains (aa 34-135), a thrombospondin (TSP-1) motif (aa 147-207), and a region rich in basic residues (aa 211-263). The furin-like domains are crucial for beta-catenin stabilization. The C-terminus of RSPO1 contains a putative nuclear localization signal, suggesting potential nuclear expression. There are also potential isoforms of RSPO1 with shorter N-termini or missing specific regions.

In summary, RSPO1 plays diverse roles in development, gender-specific differentiation, and tissue homeostasis. Its incorporation as a supplement in organoid culture has become essential for promoting the growth and survival of 3D organoids.

References:

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RUO Statement:

Recombinant Human R-Spondin 1 Protein for Research Use Only. It is not intended for diagnostic, therapeutic, or any other clinical applications.

K2 Oncology Co. Ltd.

Tel: 010-56538985

E-mail: info@k2oncology.com

Address: Room 4-101, Build 3, Zone 3, JiuCheng Tech Park, No88 5th Jinghai Rd. BDA, Beijing, China