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- PRODUCT DATA SHEET -

Name of Product: Recombinant Human VTN-Integrin β 1 Binder Fusion Protein

Catalog Number: HRP-4502

Manufacturer: LD Biopharma, Inc. USA

Introduction

Defining a matrix protein coating on cell culture plates or beads is a critical step for directing stem cell differentiation, particularly in clinical applications or organoid-based standard assay development. Although many human integrin/ligand binders—such as integrin-binding peptides and mini-antibodies (e.g., nanobodies or single-chain Fv fragments)—can be used to modulate stem cell differentiation, their low binding affinity to common polystyrene culture surfaces makes this strategy challenging. To improve coating efficiency by leveraging the high polystyrene-binding capacity of human vitronectin, we constructed HRP-4502, a fusion protein combining human vitronectin (amino acids 62–398) with a human integrin- β 1 specific binder/activator motif, to generate a new matrix protein (HRP-0502) for in vitro cell culture applications.

A gene encoding human vitronectin (62–398) and the β 1 integrin-specific binder motif was synthesized with codon optimization, and the two gene fragments were linked by a short (GGGGS)₃ linker. The fusion protein was expressed in *E. coli* as inclusion bodies. The final product was refolded using our proprietary "temperature shift inclusion body refolding" technology and purified by chromatography.

Gene Symbol:	VTN + Human Integrin β 1 Binder
Accession Number:	NP_000629 + peptide
Species:	Human
Size:	100 μ g / Vial
Composition:	0.5 mg/ml, sterile-filtered, in 20 mM pH 8.0 Tris-HCl Buffer, with proprietary formulation of NaCl, KCl, EDTA, Sucrose and DTT.
Storage:	In Liquid. Keep at -80°C for long term storage. Product is stable at 4 °C for at least 30 days.



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Key References

Bachmann, M., Kukkurainen, S., Hytonen, V. P. & Wehrle-Haller, B. ***Cell adhesion by integrins***. *Physiol. Rev.* 99, 1655–1699 (2019)

Hernandez-Gordillo, V. et al. ***Fully synthetic matrices for in vitro culture of primary human intestinal enteroids and endometrial organoids***. *Biomaterials* 254, 120125 (2020)

Nancy Ernst, et al., ***β1 Integrin Signaling Maintains Human Epithelial Progenitor Cell Survival In Situ and Controls Proliferation, Apoptosis and Migration of Their Progeny***. December 27. (2013)

<https://doi.org/10.1371/journal.pone.0084356>

Applications

Can be used as a coating matrix protein to study cell differentiation regulation of human iPS cells and ES cells *in vitro*.

Quality Control

Purity: > 93% by SDS-PAGE.

Easy Coating Protocol

Coating recombinant HRP-4502 protein for ES or iPS cell culture can be easily performed as follows:

A: Add 1ml PBS buffer to a single well of 6 well plate and mix well with 10ug recombinant VTN-β1 Binder (20ul solution, 0.5mg / ml of HRP-4502 stocking solution), place culture plate at 4 °C for overnight.

B: Plates are ready for routine ES or iPS culture or cell differentiation experiments. (Remove coating PBS buffer before cell culture).

Note: Different culture plates such as CELLSTAR polystyrene dishes and BD Falcon hydrophobic surface have different binding capacities for various proteins. For CELLSTAR 6 well plate, 5ug recombinant VTN-β1 Binder/well works well, but for BD falcon dishes, requires 10ug recombinant VTN-β1 Binder/well for coating. (**In general**, 10 ng VTN-β1 Binder/mm² for coating will be a good start concentration for initial testing).