

## Rat MSP1E3D1-His protein

Product	Catalog No.	Package size
Rat MSP1E3D1-His, lyophilized protein (2 mg)	26852	2 mg
Rat MSP1E3D1-His, lyophilized protein (10 mg)	26856	5 x 2 mg

### Product Description

Nanodiscs were first described by Sligar and coworkers (1, 2). Nanodiscs provide a phospholipid bilayer system held together by membrane scaffold proteins (MSPs). MSPs are truncated forms of apolipoprotein (apo) A-I which wrap around a patch of a lipid bilayer to form a disc-like particle or nanodisc (3). MSPs provide a hydrophobic surface facing the lipids, and a hydrophilic surface at the outside. This setup makes nanodiscs highly soluble in aqueous solutions and allows for the solubilization of membrane proteins in the absence of detergents. These nanobilayer particles are about 7-18 nm in diameter, depending on the mutation variant of MSP used (3). Most commonly used phospholipids are dimyristoyl-glycero-phosphocholine (DMPC) or palmitoyl-oleoyl-phosphatidylcholine (POPC) in combination with sodium cholate.

For applications where human MSP proteins might affect results (such as immunization of rats), rat MSP proteins provide a suitable alternative. These MSPs have been produced by aligning the human and rat MSP sequences in silico, followed by expressing the rat homologue sequence in *E.coli*. Cube Biotech offers rat MSP1D1 and MSP1E3D1 proteins. For use in cell-free expression reactions, pre-assembled nanodiscs with different phospholipid compositions are available.

### Reconstitution of MSP protein

Cube Nanodisc MSP1E3D1 is delivered lyophilized from a solution containing 20 mM Tris pH 7.4, 100 mM NaCl, 0.5 mM EDTA, 1 mM sodium azide. Each aliquot contains 2 mg protein. Adding 0.5 mL double distilled water will restore the original solution with a protein concentration of 4 mg/mL. This stock can be diluted further as required in the respective application protocols.

### Technical details

Purity: > 90% (SDS-PAGE)  
Number of amino acids: 267  
Molecular mass: 31572.76 Da  
Extinction coefficient (in water)  $\epsilon_{280}$ : 36,440 M<sup>-1</sup>cm<sup>-1</sup>

### Shipping & Storage

Shipment Temperature	Ambient temperature
Storage of lyophilized protein	-20°C for several months
Storage of reconstituted protein	2-8°C for several days

## Protein overview

MSP1E3D1 - His  
Membrane scaffold protein 1E3D1  
his-tagged



**Legend:** H: 6xHis, S: Spacer, T: *Tev* site, H0.5-H10: Helices 1-10  
The E3 insertion consists of helices 4-6 (light green).

## Additional Information

For nanodisc protocols, please visit our webpage at: [www.cube-biotech.com/protocols](http://www.cube-biotech.com/protocols). For background information on nanodiscs and possible applications please see <http://www.cube-biotech.com/background-tips-and-tricks/what-are-nanodiscs>. For affinity purification of His-tagged proteins, Cube Biotech offers dedicated agarose resins, magnetic beads and prepacked cartridges. Also available are a range of ultrapure detergents and buffers for extraction and purification of proteins. See [www.cube-biotech.com/products](http://www.cube-biotech.com/products) for details.

## Literature references

1. Bayburt, T.H. et al. Reconstitution and imaging of a membrane protein in a nanometer-size phospholipid bilayer. *J. Struct. Biol.* (1998), 123(1):37-44
2. Civjan, N.R. et al. Direct solubilization of heterologously expressed membrane proteins by incorporation into nanoscale lipid bilayers. *BioTechniques* (2003) 35:556-563
3. Hagn, F. et al. Optimized phospholipid bilayer nanodiscs facilitate high-resolution structure determination of membrane proteins. *J.Am.Chem. Soc.* (2013), 135:1919-1925

**Disclaimer:** Our products are intended for molecular biology applications. These products are not intended for the diagnosis, prevention, or treatment of a disease.

Nanodiscs are protected by US Patents 7,691,414; 7,662,410; 7,622,437; 7,592,008; 7,575,763; 7,083,958; 7,048,949

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