

## MSP1E3D1\_D73C-His protein

| Product  | Catalog No. | Package size |
|--|-------------|--------------|
| MSP1E3D1-D73C-His, lyophilized protein (2 mg)  | 27252       | 2 mg         |
| MSP1E3D1-D73C-His, lyophilized protein (10 mg) | 27256       | 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 7-13 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.

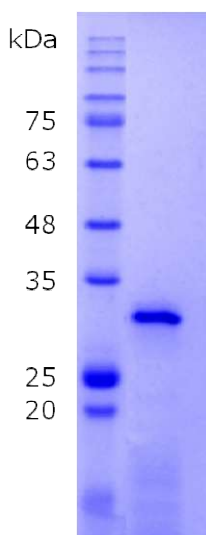
Cube Biotech offers MSP1D1, MSP1E3D1, MSP2N2 and MSP1D1ΔH5 proteins, both as his-tagged and untagged versions. For use in cell-free expression reactions, pre-assembled nanodiscs and nanodisc assembly kits that contain the lyophilized proteins and pre-aliquoted amounts of lipids and sodium cholate are available.

The D73C mutant protein has been developed to facilitate the directed addition of biotin or other molecules via the SH group of the single cysteine residue. Ready-to-use, biotinylated MSP are available on request.

### 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 by the different application protocols.



### Technical details

Purity: > 90% (SDS-PAGE)  
 Number of amino acids: 278  
 Molecular mass: 32,719 Da  
 Extinction coefficient (in water)  $\epsilon_{280}$ : 29910 M<sup>-1</sup>cm<sup>-1</sup>

### Shipping & Storage

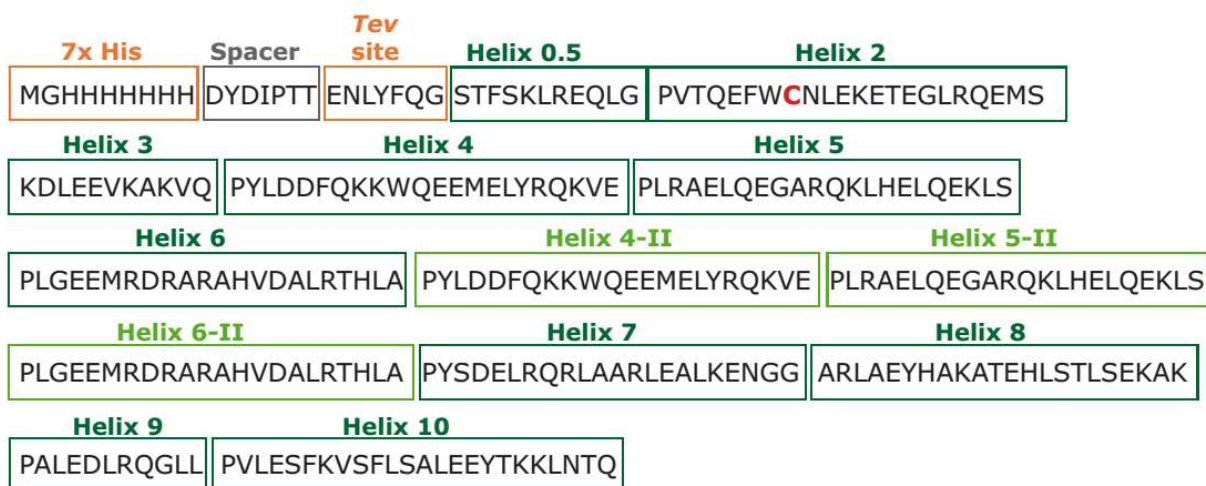
|                                  |                          |
|----------------------------------|--------------------------|
| Shipment Temperature             | Ambient temperature      |
| Storage of lyophilized protein   | -20°C for several months |
| Storage of reconstituted protein | 2-8°C for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

## Protein overview and amino acid sequence

MSP1E3D1 - His  
Membrane scaffold protein 1E3D1  
Mutation D73C  
his-tagged



**Legend:** H: 6xHis, S: Spacer, T: *Tev* site, H0.5-H10: Helices 0.5-10  
The E3 insertion consists of helices 4-6 (light green). **X**: Approximate position of D->C mutation



## 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

**Proteins are our passion.**