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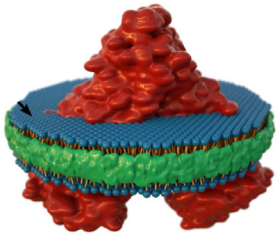
Fact Sheet
SMA-ED

NEW STYRENE-MALEIC ANHYDRIDE (SMA) POLYMERS

Detergent-free system for structural and functional studies of membrane proteins

What is it?

- Polymer-forming planar lipid bilayer nanodiscs for membrane protein reconstitution
- Direct, detergent-free reconstitution of membranes
- Stable in a broad pH range and in proximity to divalent cations
- Good for structural and functional studies of membrane proteins
- Easy nanodisc size control — adjust by changing polymer:lipid ratio

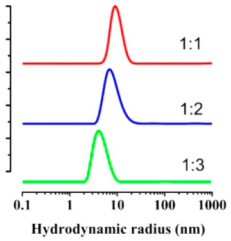


Protein in SMA nanodisc, adapted from [4].

Why use it?

- Part of Anatrace's new SMA portfolio
- Stable at all pH conditions (excluding those between 5 and 7) [1]
- Found to be tolerant to Ca^{2+} and Mg^{2+} for all tests at pH 3.5 (from 10 to 200 mM) [1]

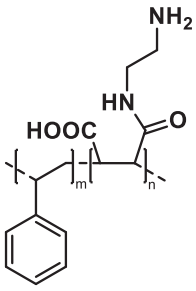
pH stability of SMA-ED, adapted from [2]. Stabilizing pH range shown in green.



DLS profiles showing the different sized nanodiscs obtained by varying the lipid-to-polymer weight ratio for SMA-ED [1].

Background

- Styrene:Maleic anhydride 1:1
- Molecular Weight ~7.8 kDa
- Solubility (Water) ≤20%
- pH (1% in water) 2.0



Structure of SMA-ED, with ethylene diamine functionalization

Applications

- Studies of membrane proteins in native lipid environments
- Structural studies of large membrane proteins and complexes
- Studies of protein:lipid interactions
- Work with proteins unstable in detergents
- Solubilization of membrane proteins at low or high pH conditions

Ordering Information

Item #	Description	UOFM	UOM 2021
SMA-ED 1 G	SMA-ED	EA	$560
SMA-ED 500 MG	SMA-ED	EA	$310
SMA-ED 250 MG	SMA-ED	EA	$175

Supporting Documentation: SDS • CoA

References

[1] Ravula, T. et al. Effect of polymer charge on functional reconstitution of membrane proteins in polymer nanodiscs. Chem Commun 54, 9615–9618 (2018).
[2] Ravula, T., Hardin, Nathaniel. Z., Mauro, G. M. D. & Ramamoorthy, A. Styrene maleic acid derivates to enhance the applications of bio-inspired polymer based lipid-nanodiscs. Eur Polym J 108, 597–602 (2018).
[3] Ravula, T., Hardin, N. Z. & Ramamoorthy, A. Polymer nanodiscs: Advantages and limitations. Chem Phys Lipids 219, 45–49 (2019).
[4] Chen, A., Majdinasab, E. J., Fiori, M. C., Liang, H. & Altenberg, G. A. Polymer-Encased Nanodiscs and Polymer Nanodiscs: New Platforms for Membrane Protein Research and Applications. Frontiers Bioeng Biotechnology 8, 598450 (2020).

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