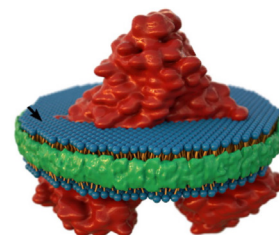


NEW STYRENE-MALEIC ANHYDRIDE (SMA) POLYMERS

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



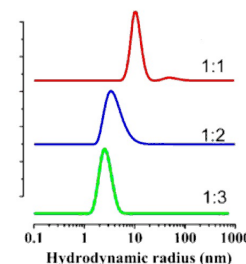
Protein in SMA nanodisc, adapted from [4].

Why use it?

- Part of Anatrace's new SMA portfolio
- Stable under acidic conditions: pH<6 [1]
- Found to be tolerant to Ca²⁺ and Mg²⁺ for all tests at pH 3.5 (from 10 to 200 mM) [1]



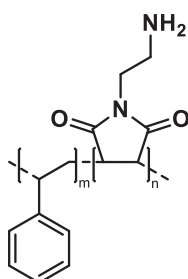
pH stability of SMAd-A, adapted from [2].
Stabilizing pH range shown in green.



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

Background

- Styrene:Maleic anhydride 1:1
- Molecular Weight ~7.8 kDa
- Solubility (Water) ≤20%
- pH (1% in water) 2.8



Structure of SMAd-A, hydrophilic amine portion of the 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
SMAd-A 1 G	SMAd-A	EA	\$850
SMAd-A 500 MG	SMAd-A	EA	\$475
SMAd-A 250 MG	SMAd-A	EA	\$265

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 derivatives 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).