

Zwitterionic SMA derivative for Membrane Protein (MP) Study

What is it?

Anatrace offers **zSMA-217**, a next generation Zwitterionic derivative of alternating Styrene Maleic Acid (SMA) copolymer with a **S/MA ratio of 2:1**, which shows increased stability across a wide pH range and higher concentrations of divalent Cations (Ca^{2+} & Mg^{2+}) suitable for a direct, detergent-free reconstitution of membranes. The starting copolymer has a lower Molecular weight, 7kD and derivatized with a zwitterionic Phosphatidylcholine moiety.

Why use it?

- Perfect zero Zeta potential of zSMALPs in Tris buffer (pH 7.4) (Image A)
- Dissolves DMPC liposome (196 nm) into nanometer sized zSMALPs (26nm) (Image B)
- Stable across a pH range of 4-10 (Image C)
- No aggregation in presence of divalent cations.
- Improved buffer compatibility due to wide pH tolerance.

Protein Applications:

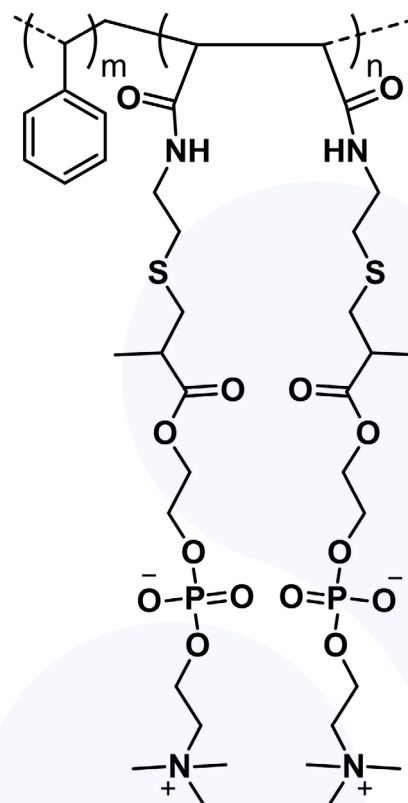
- Retinal-binding MP found in aquatic bacteria that acts as a light-driven proton pump: **Proteorhodopsin (PR)**
- pH-gated potassium ion channel found in the bacterium *Streptomyces lividans*: **KcsA**
- ABC protein (an ATP-binding cassette transport ATPase) in *E.Coli*: **MsbA** (Image D)

Product Specification

- Styrene/Maleic Anhydride ratio 2:1
- Molecular Weight: 21-24 kD
- Molecular Weight of starting copolymer: 7 kD
- Identity: NMR
- Storage Conditions: -20°C
- Solubility: $\geq 20\%$ in water

References

Fiori, M.C., Jiang, Y., Altenberg, G.A. *et al.* Polymer-encased nanodiscs with improved buffer compatibility. *Sci Rep* **7**, 7432 (2017).



Applications

- Solubilize MPs into Nanodiscs (NDs) of controlled size.
- Detergent free solubilization of MPs.
- Compatible with enzyme assays requiring lower pH or that require divalent ions.

Image A.
Zeta Potential Distribution of the zSMALPs

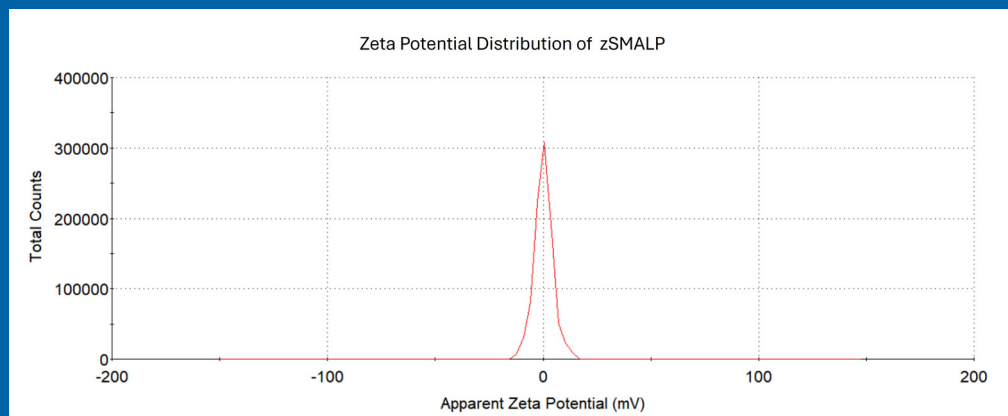


Image B.
Solubilization of DMPC Liposomes into zSMALP Nanoparticles (1:1 polymer to lipid ratio by weight)

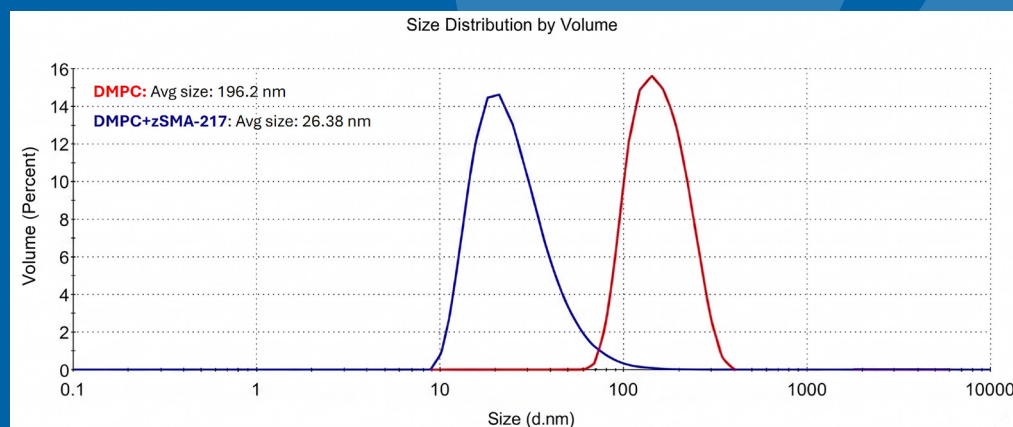


Image C.
Stability of zSMA-217 across a wide pH range.

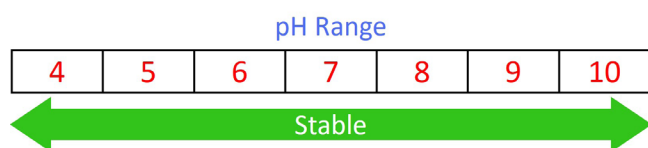
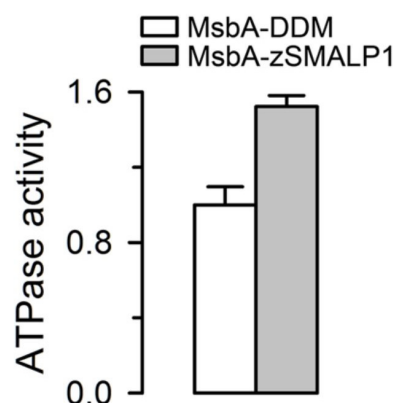


Image D.
ATPase activity of MsbA in DDM & zSMALP



Ordering/Catalog info

Part #	Description	Unit Size
zSMA-217 50 MG	zSMA-217	50 mg
zSMA-217 250 MG	zSMA-217	250 mg
zSMA-217 500 MG	zSMA-217	500 mg
zSMA-217 1 GM	zSMA-217	1 gm