Electronic Supplementary Information (ESI)

Polymersome formation induced by encapsulation of water-insoluble molecules within ABC triblock terpolymers

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Scattering Function of the Polymersome Bilayer

The scattering function for a large shell with the core corona cross-sectional structure was calculated using eq 1 in the main text.[S1] $P_0(q)$ denotes the form factor of an infinitely thin shell, and $E_{\mathrm{core}}(q)$, $E_{\mathrm{corona}}(q)$, and $E_{\mathrm{chain}}(q)$ denote the scattering amplitudes from the core, corona, and individual corona chain, given by

$$P_0 = \left[\frac{\sin(qR_{\mathrm{ves}})}{qR_{\mathrm{ves}}}\right]^2 \tag{S1}$$

$$E_{\mathrm{core}}(q) = \frac{\sin\left(\frac{qL}{2}\right)}{\frac{qL}{2}} \tag{S2}$$

$$E_{\mathrm{corona}}(q) = \frac{1-\exp(-q^2\langle S^2\rangle_{\mathrm{corona}})}{q^2\langle S^2\rangle_{\mathrm{corona}}}\cos\left[q\left(\frac{L}{2}+\langle S^2\rangle_{\mathrm{corona}}^{\frac{1}{2}}\right)\right] \tag{S3}$$

$$E_{\mathrm{chain}}^2(q) = \frac{2[\exp(-q^2\langle S^2\rangle_{\mathrm{corona}})-1+q^2\langle S^2\rangle_{\mathrm{corona}}]}{q^4\langle S^2\rangle_{\mathrm{corona}}^2} \tag{S4}$$

R_{ves} is the radius of the thin shell. Note that eq S1 forms the framework of the shell-like structure (vesicle), and eqs S2–S4 consider the cross-sectional structure.

Reference

(1) Pedersen, S. P.; Form Factors of Block Copolymer Micelles with Spherical, Ellipsoidal and Cylindrical Cores. *J. Appl. Cryst.* **2000,** *33,* 637–640.