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#### Supporting Information

to

# Fabrication of Diverse Multi-compartment Micelles by Re-dispersion of Triblock

# **Terpolymer Bulk Morphologies**

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## 1. Specifics of the SBT triblock terpolymers

Code	Composition <sup>a</sup>	<b>N</b> s <sup>b</sup>	N <sub>B</sub> b	NTp	SBBc	Ø₿°	$\mathbf{M}_{n}^{d}$
S <sub>300</sub> B <sub>754</sub> T <sub>57</sub>	S <sub>39</sub> B <sub>51</sub> T <sub>10</sub>	300	754	57	0.21	0.16	80
S <sub>305</sub> B <sub>523</sub> T <sub>64</sub>	S <sub>46</sub> B <sub>41</sub> T <sub>13</sub>	305	523	64	0.24	0.12	69
S <sub>310</sub> B <sub>383</sub> T <sub>57</sub>	S <sub>53</sub> B <sub>34</sub> T <sub>13</sub>	310	383	57	0.22	0.08	61
S <sub>307</sub> B <sub>525</sub> T <sub>76</sub>	S45B40T15	307	525	76	0.28	0.11	71
S <sub>539</sub> B <sub>173</sub> T <sub>89</sub>	S <sub>72</sub> B <sub>12</sub> T <sub>16</sub>	539	173	89	0.25	0.02	78
S <sub>301</sub> B <sub>756</sub> T <sub>105</sub>	S <sub>36</sub> B <sub>47</sub> T <sub>17</sub>	301	756	105	0.39	0.16	87
S <sub>307</sub> B <sub>379</sub> T <sub>82</sub>	S <sub>50</sub> B <sub>32</sub> T <sub>18</sub>	307	379	82	0.31	0.09	64
S <sub>509</sub> B <sub>538</sub> T <sub>156</sub>	$S_{51}B_{28}T_{21}$	509	538	156	0.43	0.07	104
S <sub>539</sub> B <sub>173</sub> T <sub>139</sub>	$S_{66}B_{11}T_{23}$	539	173	139	0.38	0.02	85
S <sub>298</sub> B <sub>747</sub> T <sub>161</sub>	$S_{33}B_{43}T_{24}$	298	747	161	0.60	0.16	94
S <sub>507</sub> B <sub>537</sub> T <sub>358</sub>	S <sub>40</sub> B <sub>22</sub> T <sub>38</sub>	507	537	358	0.99	0.07	132
S <sub>511</sub> B <sub>544</sub> T <sub>409</sub>	S <sub>38</sub> B <sub>21</sub> T <sub>41</sub>	511	544	409	1.12	0.07	140
S <sub>512</sub> B <sub>547</sub> T <sub>464</sub>	S <sub>36</sub> B <sub>20</sub> T <sub>44</sub>	512	547	464	1.27	0.07	148

**Table S1** Specification for the SBT triblock terpolymers employed.

<sup>a</sup> Subscripts denote the degree of polymerization, N of the respective blocks. <sup>b</sup> Subscripts denote the weight fraction of each block. <sup>c</sup> Calculation based on q = 7.4 in 90 v% acetone. <sup>d</sup> Molecular weight in kg/mol.

## 2. NMR analysis of Ace/IPA compositions



Figure S1. Variation of Ace:IPA composition according to <sup>1</sup>H-NMR measurements of several SBT triblock terpolymers.

	Aceton IPA
	e ↓ ↓
10:90 → 9.2:90.8	
	[1.00] [9.95]
20:80 → 19.5:80.5	, M
	[1.00] [4.17]
<b>30:70</b> → <b>28.8:71.2</b>	A M
	[1.00] [2.47]
<b>1</b> 0:60 → <b>4</b> 0.3:59.7	. <u> </u>
	[1.0g] (1.48)
50:50 → 46.5:53.5	
	(1.00) (1.15)
i0:40 → 56.2:43.8	
	(1.00) (0.79)
<b>70:30</b> → 67.5:32.5	Δ
	[1.00] [0.48]
30:20 → 79.5:20.5	
	[1.0g] [0.26]
90:10 → 89:11	
	[1.0ġ] [0.13]
7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5	3.0 2.5 2.0 1.5 1.0 0.5 0.0

Figure S2. <sup>1</sup>H-NMR measurements for tracking changes in solvent composition after thermal annealing.

#### 3. DLS analysis of SBT MCMs



Figure S3. DLS measurements before and after temperature annealing for selected SBTs a, b) S<sub>507</sub>B<sub>537</sub>T<sub>358</sub>, c, d) S<sub>307</sub>B<sub>525</sub>T<sub>76</sub>, and e, f) S<sub>512</sub>B<sub>547</sub>T<sub>464</sub>.

4. Bulk morphologies exemplified on S<sub>507</sub>B<sub>537</sub>T<sub>358</sub> and S<sub>307</sub>B<sub>525</sub>T<sub>76</sub> of Figure 1 (main text)



**Figure S4. TEM of bulk morphologies of a)** S<sub>507</sub>B<sub>537</sub>T<sub>358</sub> (lamella-lamella) and **b)** S<sub>307</sub>B<sub>525</sub>T<sub>76</sub> (core-shell gyroid) Samples were stained with OsO4; PB appears black, PS as dark grey and PT is brightest.



### 5. Ellipsoidal polymersomes with PB cylinder morphology

Figure S5. TEM images of  $S_{307}B_{525}T_{76}$  in Ace:IPA 80:20 (v/v). a) Overview image showing ellipsoidal polymersomes, b) a deflated polymersome with creases, and c) close-up of the polymersome tip with the PB cylinder morphology. Samples were stained with OsO<sub>4</sub>; PB appears dark, PS grey and PT is not visible.



Figure S6. TEM overview image of  $S_{512}B_{547}T_{464}$  in Ace:IPA 90:10 (v/v). Sample stained with OsO<sub>4</sub>; PB appears dark, PS grey and PT is not visible.

# 7. Helix-on cylinder morphology



**Figure S7. TEM overview images and close-ups of the helix-on-cylinder morphology**. Samples were stained with OsO<sub>4</sub>; PB appears dark, PS bright and PT is not visible.

8. Bilayer discs and polymersomes with PB spheres in the PS membrane



**Figure S8. Supporting TEM images of a, b)** spheres-on-bilayer discs and **c, d)** spheres-on-polymersomes. Samples were stained with OsO<sub>4</sub>; PB appears dark, PS grey and PT is not visible.

### 9. Polymersomes with bicontinous membrane



**Figure S9. Supporting TEM images of polymersomes with a bicontinous membrane morphology.** Samples were stained with OsO<sub>4</sub>; PB appears dark, PS grey and PT is not visible.

10. Polymersomes with lamellar membrane (core-shell)



**Figure S10.** Supporting TEM images of polymersomes with a lamellar membrane morphology. a) TEM overview image, **b**, **c**) close-up of the membrane. Samples were stained with OsO4; PB appears dark, PS grey and PT is not visible.

#### 11. Supporting images to Figure 5 (Main Text)



**Figure S11. TEM overview for Figure 5 (main text). a-c)**  $S_{512}B_{547}T_{464}$  fully developed spheres-on-spheres (Ace:IPA 90:10 (v/v)), flattened spheres-on-spheres (Ace:IPA 60:40 (v/v)), core-shell-spheres (Ace:IPA 10:90 (v/v)). **d-f)**  $S_{298}B_{747}T_{161}$  double helices cylinders (Ace:IPA 90:10 (v/v)), cylinders with ribbon-like patchy structure (Ace:IPA 70:30 (v/v)), core-shell-cylinders (Ace:IPA 40:60 (v/v)). **g-i)**  $S_{310}B_{383}T_{57}$  forming cylinders-on-elongated vesicles (Ace:IPA 90:10 (v/v)), vesicles with PB bicontinous membrane (Ace:IPA 70:30 (v/v)), vesicles with core-shell PB membrane (Ace:IPA 30:70 (v/v)).