## **Supporting information**

## **Preparation of Vesicular solutions:**

A calculated amount of neat Triton X-100 was added to a purple solution of  $C_{60}$  in toluene (0.1 mM; 1 mL) and sonicated for 5 min. Toluene was evaporated under a stream of N<sub>2</sub> at 40-50°C, after which a required volume of water was added to form a straw yellow dispersion of  $C_{60}$ . The solutions were prepared in the concentration range 0-50 mM w.r.t TX-100. The concentration of  $C_{60}$  in the final aqueous solution was estimated spectrophotometrically as 0.025 mM. The solutions were incubated at 27 °C in dark for 10 days.



**Figure S1**. (a) UV-visible absorption profiles of  $C_{60}$  in toluene and aggregated  $C_{60}$  in TX-100 micelles with  $[C_{60}] = 0.025$  mM. (b) UV-visible absorption profiles of  $C_{60}$  in toluene and monomeric  $C_{60}$  encapsulated in TX-100 micelles. Expanded UV-visible absorption profiles showing (c) broad visible around absorptions at 340 nm and 450 nm characteristic of  $(C_{60})_n$ . (d) hypsochromic 404 nm spike characteristic of monomeric  $C_{60}$ .



**Figure S2.** TEM image of  $C_{60}$ : TX-100 [0.025 mM : 30 mM] Vesicles after an equilibration time of 10 days



**Figure S3.** Optical micrograph of  $C_{60}$ :TX-100 gel phase separated after ~6 months showing aggregated/fused vesicular network. The pointers denote the budding of a "Y' junction of the fibrillar network.



**Figure S4.** Optical micrograph of  $C_{60}$ :TX-100 gel phase evidencing bamboo like appearance of the hollow tubules along with a Y-junction formed.



**Figure S5.** Mean size distribution from light scattering measurements of  $C_{60:}TX-100$  ([TX-100] = 30 mM; [ $C_{60}$ ] = 0.025 mM) vesicles after (a) 1st day (b) 7th day (c) a fresh solution of  $C_{60:}TX-100$  with ([TX-100] = 50 mM).

0.025 mM	Mean Diameter, D <sub>h</sub> (nm)					
С <sub>60</sub> @ТХ- 100	Fresh soln.	PD*	7th day	PD	16th day	PD
0.3 mM	175.7	0.245	162.7	0.245	151.1	0.243
0.5 mM	172.9	0.266	161.3	0.250	160.7	0.283
10 mM	131.6	0.313	130.8	0.267	131.2	0.309
20 mM	84.9	0.306	83.4	0.305	80.6	0.274
30 mM	70.2	0.363	120.9	0.190	121.8	0.182
40 mM	43.9	0.230	116.9	0.363	119.5	0.189
50 mM	8.4	0.172	62.9	0.275	205.4	0.384
100 mM	8.6	0.173	11.4	0.109	11.2	0.096

**Table 1.** Mean size of various self-assembled structures formed after encapsulation of  $C_{60}$  into TX-100 system. PD refers to polydispersity index. The color legends green and cyan represent ( $C_{60}$ )<sub>n</sub> and ( $C_{60}$ ) respectively



**Figure S6.** (a) Optical image of the Y-junctioned network. Inset shows the optical image of the Y-junction from which the confocal measurement was obtained ( $\lambda_{ex} = 514.2$  nm). The pointers show the Y-junctions of the network.



Scheme S1. Mechanism of tubule and Y-junction formation from C<sub>60</sub>:TX-100 vesicles.