SUPPLEMENTARY INFORMATION

Spontaneous formation of nanometer scale tubular vesicles in aqueous mixtures of lipid and block copolymer amphiphiles

Seng Koon Lim[a,‡], Andrew Wong[b,‡], Hans-Peter M. de Hoog[a], Padmini Rangamani[c], Atul N. Parikh*[,a,d], Madhavan Nallani[a], Sara Sandin[b,e], and Bo Liedberg*[,a]

[a]Centre for Biomimetic Sensor Science, School of Materials Science & Engineering, Nanyang Technological University, Singapore 637553

[b]NTU Institute for Structural Biology, Nanyang Technological University, 639798 Singapore; School of Biological Sciences, Nanyang Technological University, 60 Nanyang Drive, Singapore 637551

[c]Department of Mechanical and Aerospace Engineering, University of California, San Diego, La Jolla, California 92093 USA

[d]Departments of Biomedical Engineering and Chemical Engineering & Materials Science, University of California, Davis, California 95616 USA

[e]School of Biological Sciences, Nanyang Technological University, 60 Nanyang Drive, Singapore 637551.

[‡] Equal contribution

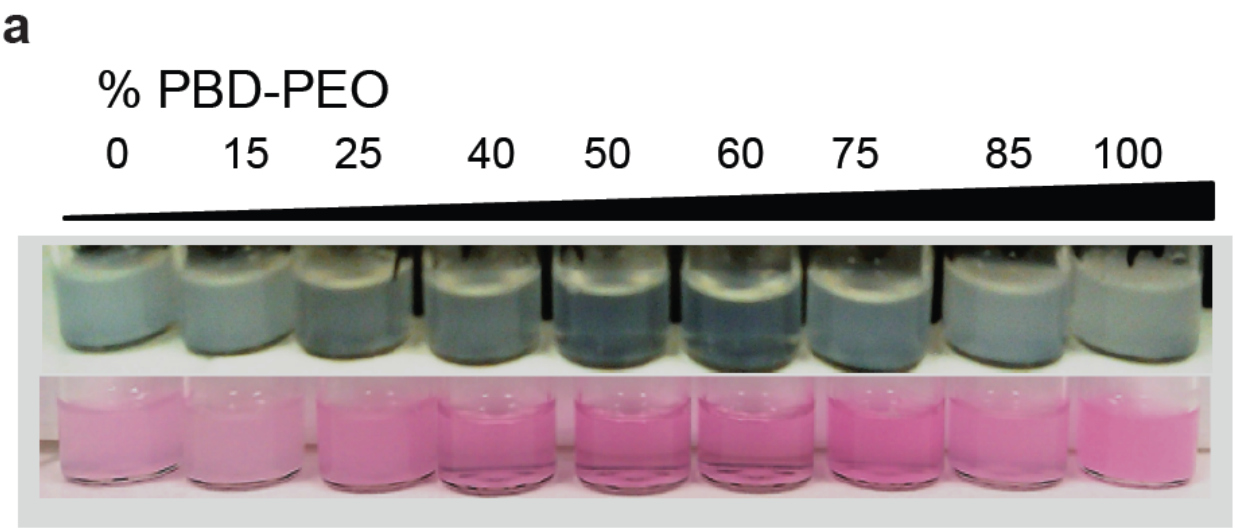
Supplementary Figure Legends

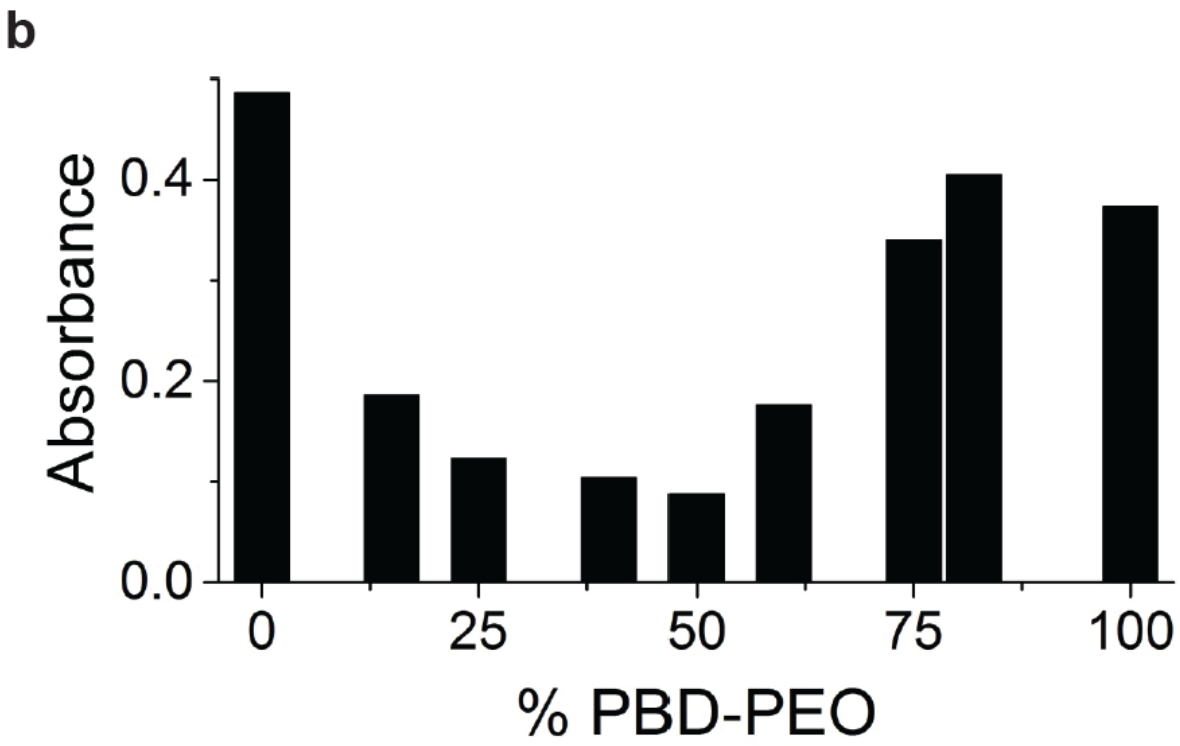
Supplementary Figure S1. Turbidity of vesicle preparations. (a) Optical photographs of the spontaneously formed vesicle suspension, prior to extrusion, showing the difference in turbidity depending on vesicle composition. Vesicles were rehydrated with PBS (top), or labeled with 0.5% Rho-PE (Bottom). (b) Turbidity (absorbance at 630 nm) as a function of PBD-PEO molar fraction for the pre-extruded 5 mg mL^{-1} PBD-PEO/POPC hybrid vesicles sample.

Supplementary Figure S2. Cryo-EM images of nanostructures formed from thin film rehydration of (a) POPC (b-d) POPC/PBD-PEO (75:25, 50:50, 25:75), and (e) PBD-PEO. Tubular structures were observed in POPC/PBD-PEO mixtures (b-d) with the highest concentration at a mixture of 50:50. Dark regions represent the carbon support film. Light regions vitrified ice.

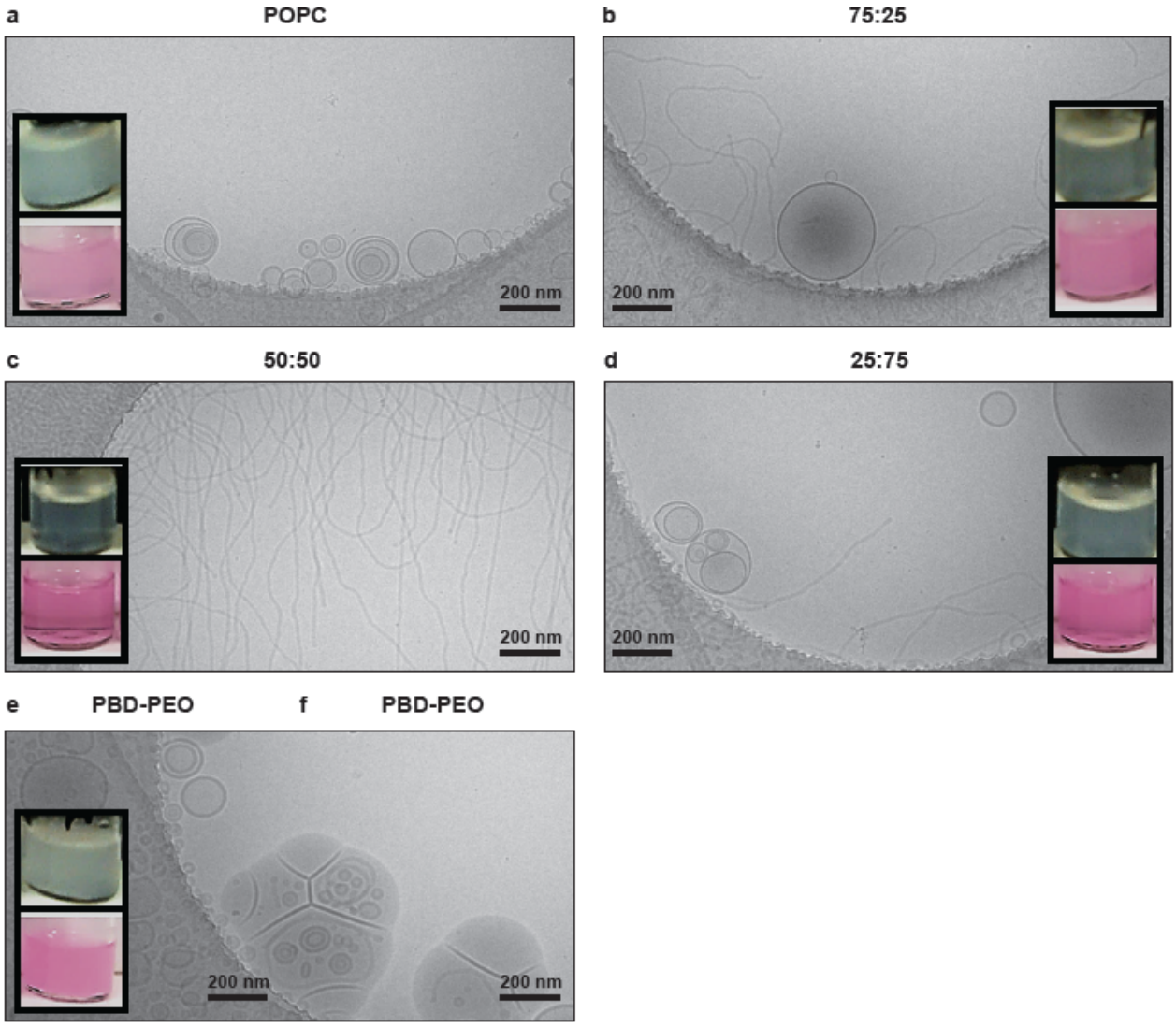
Supplementary Video 1. Cryo-EM tilt series of POPC/PBD-PEO (50:50).

Supplementary Video 2. 3D reconstruction of the cylindrical vesicles derived from tomograms of vitrified POPC/PBD-PEO (50:50).





Lim et al. Supp Figure s1



Lim et al. Supp Figure s2