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Supporting Information

Driving a Planar Model System into the 3rd Dimension: Generation and Control of Curved Pore-Spanning Membrane Arrays

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Fig. S1 depicts a representative scanning electron microscope (SEM) image (top view) of a porous substrate used for the experiments. SEM measurements were performed with a LEO Gemini 1530 SEM with acceleration voltages between 1 and 6 kV.

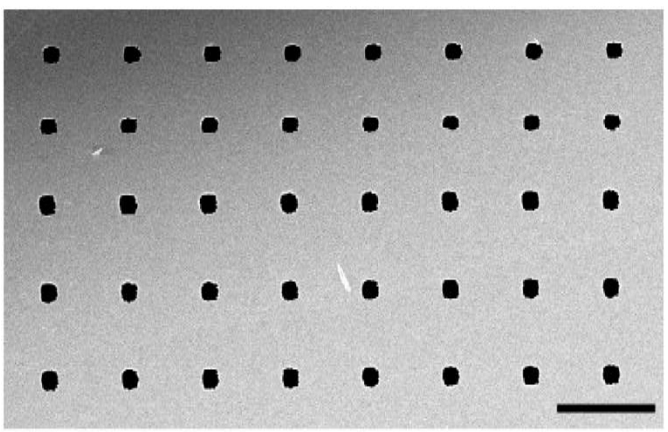

Fig. S1. Scanning electron microscopy image of a porous substrate with an interpore distance of 4 µm and a pore diameter of 850 nm. Scale bar: 5 µm.

Fig. S2 displays fluorescence images of Texas Red DHPE (A) labelled pore-spanning membranes (DPhPC/PIP_2 99:1) after the addition of Alexa488-labelled ENTH domain (B). The membranes were imaged 40 min after ENTH domain addition. The overlay of both fluorescence images (C) show the co-localization of both fluorophores indicating a homogeneous binding of ENTH domain to the membranes.

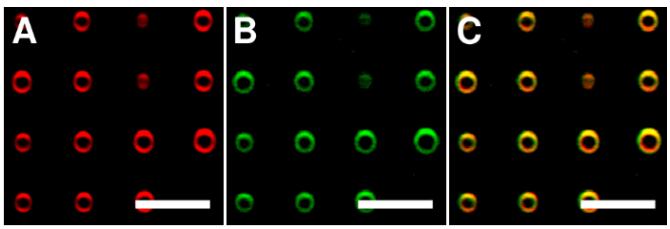

Fig. S2. Confocal laser scanning fluorescence microscopy image of **A**. Texas Red DHPE labelled protruded pore-spanning DPhPC/PIP_2 (99:1) membranes after applying an osmolarity gradient of 19 mOsmol/L, and **B**. Alexa488-labelled ENTH domain (c = 3 µM) bound to the membranes. **C.** Overlay of the fluorescence images of **A**. and **B**. Scale bars: 5 µm.

Fig. S3 shows individual time traces of the relative radius r/r_0 of pore-spanning DPhPC/PIP_2 (99:1, µm, n_0 = 73) to show the deviation within an experiment.

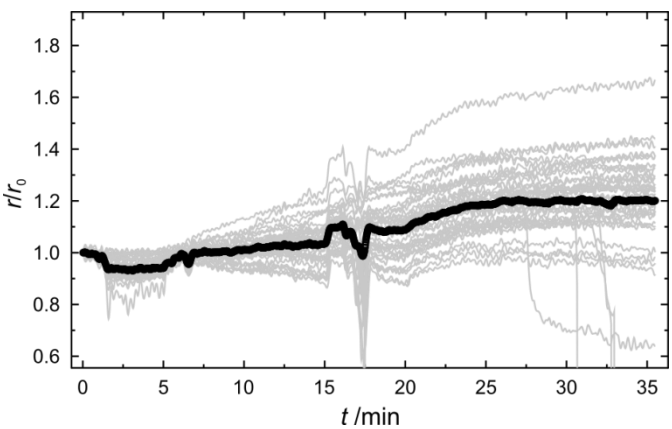

Fig. S3. Change of the radius of individual protruded pore spanning membranes composed of DPhPC/PIP_2 (99:1) as a function of time (gray solid lines) after the addition of 3 µM ENTH domain (t = 0 min). The osmolarity gradient was set to 19 mOsmol/L. The thick black line is the average curve calculated from the n_0 = 73 individual curves.

Fig. S4 illustrates the calculated change in height h of the protrusions as a function of the lateral membrane tension σ as obtained from eq. (5) and (6) for an osmolarity gradient of ΔO = 19 mOsmol/L.

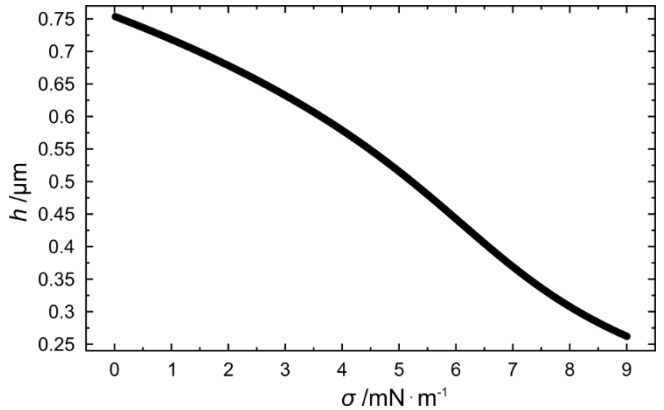

Fig. S4. Calculated height h of the protrusions as a function of lateral membrane tension σ for a given fixed osmolarity gradient of 19 mOsmol/L.

Movie S1 shows a time series of three dimensional confocal fluorescence z-stack images of pore-spanning membranes (DPhPC/PIP_2 99:1, labelled with Texas Red DHPE after applying an osmolarity gradient of 19 mOsmol/L). Data were acquired with a spinning disk confocal fluorescence microscope and the images were rendered using the program IMARIS. ENTH domain (3 µM) was added at t = 0 s. Shrinking as well as growing of pore-spanning membranes is visible.