Supplementary Information (SI) for Soft Matter.

Supplementary Information

Lipid bilayer fracture under uniaxial stretch

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I. Supplementary Figures 1-3

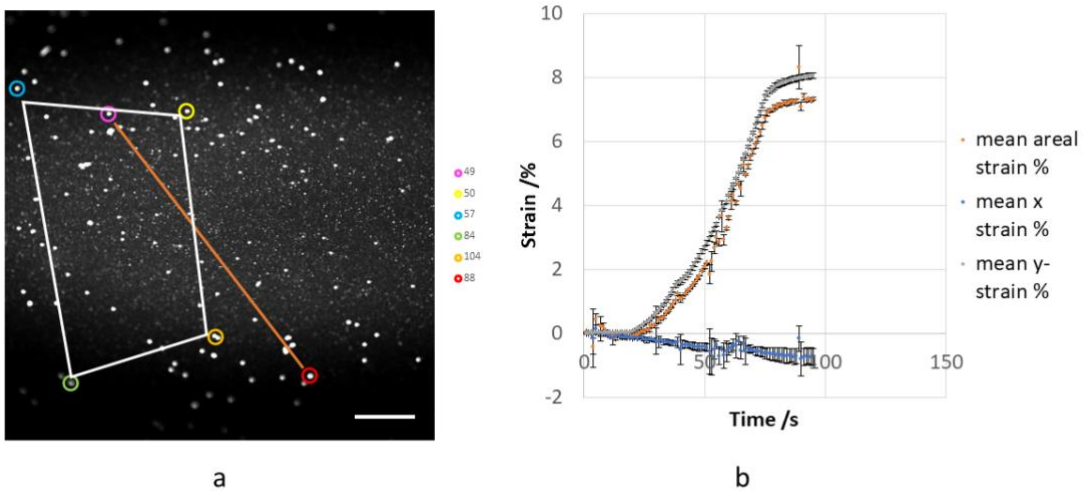

Figure S1. Uni-direction PDMS strain.

(a) Microscopic image of the PDMS sheet with embedded fluorescent beads. Areal strain is measured from 4 beads, and linear strains - longitudinal and lateral, are measured by tracking the distance between various pairs of points. (b) Mean areal strain (orange), and mean linear strains in perpendicular (grey) and parallel (blue) directions to the length of the acrylic support, plotted as a function of time while the pump operates. The mean and the errors on the mean are obtained from at least 3 combinations of points. For uni-axial deformations the areal strain is very similar to the dominant linear strain.

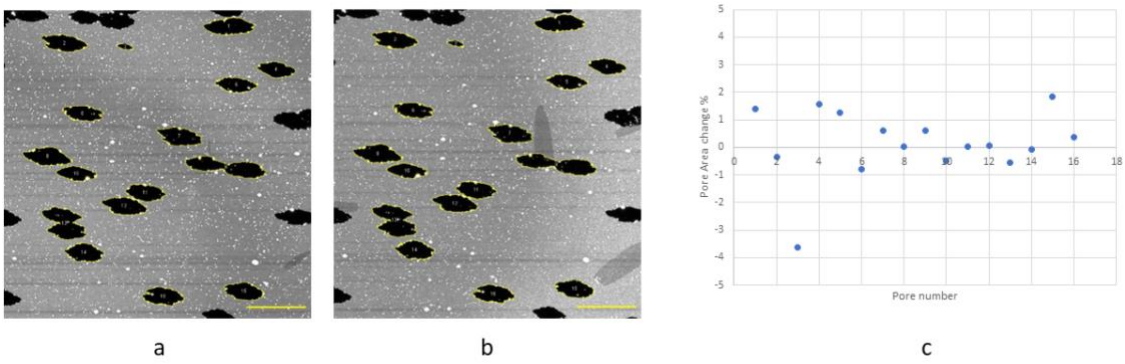

Figure S2. Pores do not change over time while the stretch is held constant.
(a,b) Microscopic images of the SLB (a) immediately after the end of the stretch process, and (b) 120 min later. (c) Plot showing the percentage area change of 10 pores selected from the images over this time period.

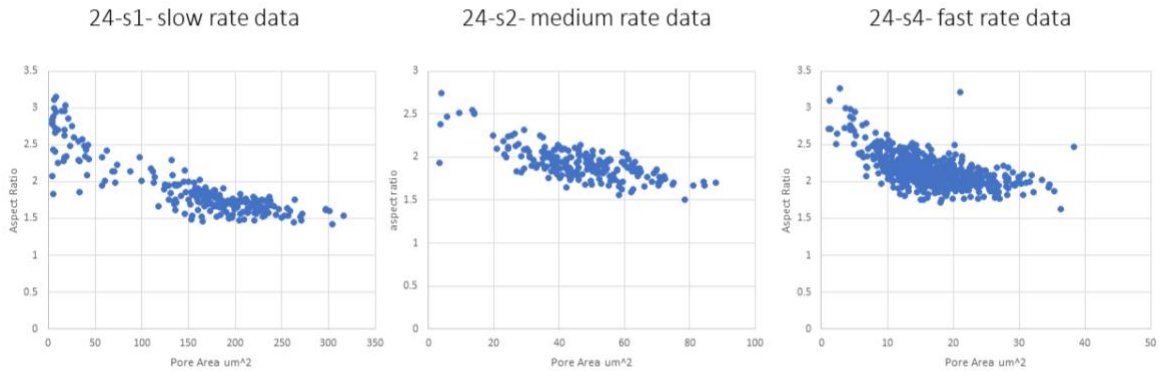

Figure S3 Aspect ratio of pores as a function of their area.
Pore area vs aspect ratio for a selection of pores at the end of the stretch process performed at slow, medium and fast strain rates. Pores that appear early in the stretch process have larger area and smaller aspect ratio at the end of the stretch. Pores that appear late in the stretch process reach smaller areas but have larger aspect ratio.

II. Supplementary movies information

The images in Figures 1 and 3 come from the following movies:
SI Movie S1: Stretching of continuous SLB at slow strain rate
SI Movie S2: Stretching of continuous SLB at medium strain rate
SI Movie S3: Stretching of continuous SLB at fast strain rate

SI Movie S4: Stretching of SLB patches at fast strain rate.
The SLB patches are obtained by fusing giant vesicles to the plasma oxidised PDMS sheet. The procedure for obtaining patches is described in *Stubbington et al*., Soft Matter, 2017,13, 181-186.