Supporting online material:

Title: Effect of shape on fracture of soft elastic gel subjected to shear load
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1. Fracture experiment in which the transparency sheet was used as the tearing tool:

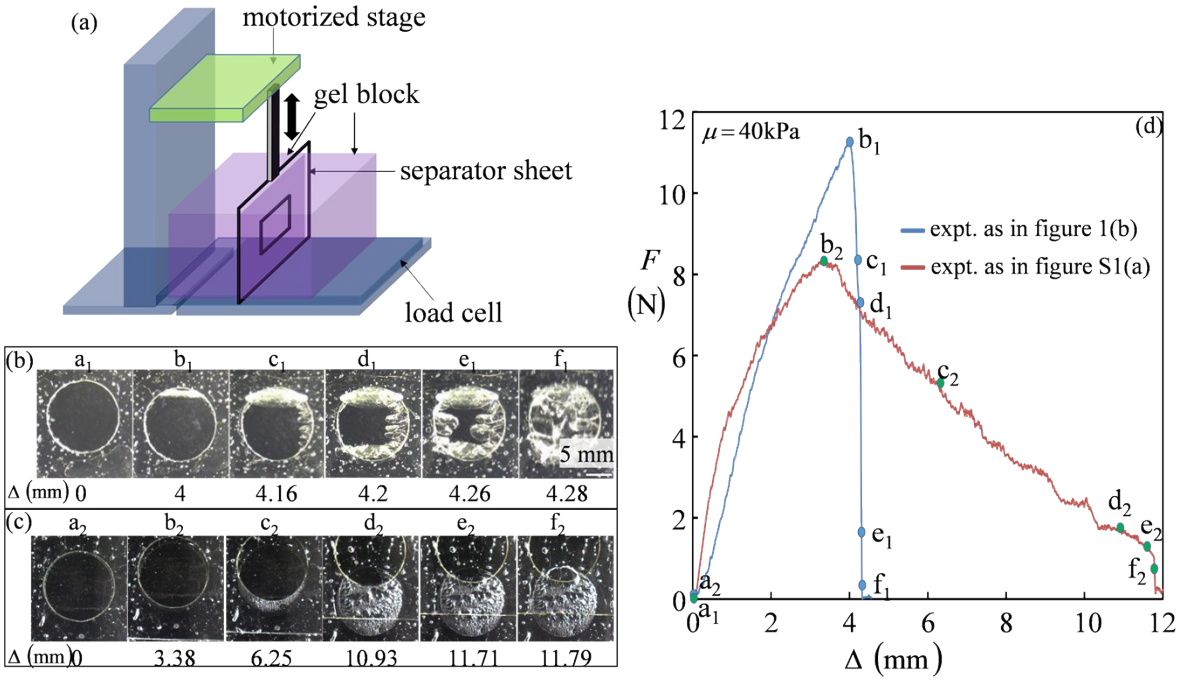

Figure S1. Fracture by pulling off separator sheet. (a) The schematic of experiment in which a monolithic gel block comprises of two rectangular blocks joined through a thin gel disk. Both the portions of the block remain attached to a load cell. The separator sheet is pull vertically up at a controlled rate using a micro-stage, eventually leading to fracture. (b) The sequence of images taken from video micrographs shows the events leading to fracture for experiment as in figure 1(b) and in figure S1(a) respectively. The shape of the gel disk is circular of diameter 14.14 mm. (c) The corresponding load vs. displacement plots for two different loading condition.

2. Fracture experiments for examining the reproducibility of force vs. displacement data:

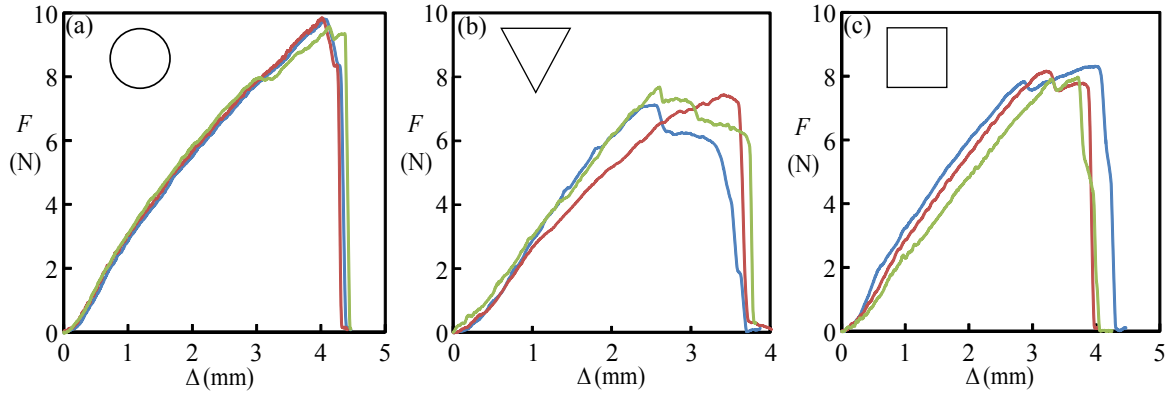

Figure S2. The shear fracture experiment as described in figure 1(b) was repeated for several samples of each particular shape of the disk joint. The force vs. displacement data from these experiments (represented by different colors) nearly overlap on each other for respective disk-shapes, signifying that crack initiation and propagation occur deterministically with reproducible results. The plots (a) to (c) represent disk joints having the shape of a circle, a triangle and a square respectively.

3. Fracture experiment with and without a pre-crack

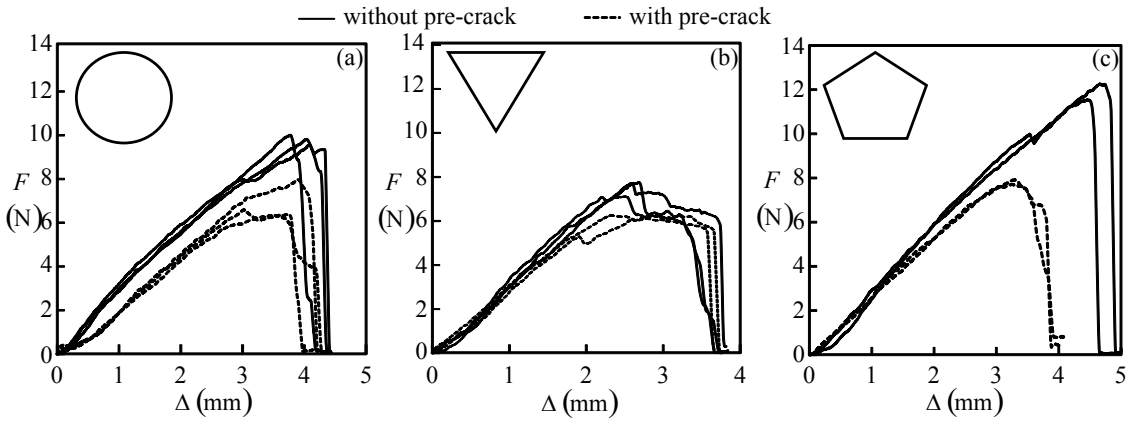

Figure S3. Shear fracture experiments as described in figure 1(b) were carried out in two different ways: without and with a pre-crack inserted between the gel disk and supported portion of the gel block. The plots (a) to (c) represent disk joints of the shape of a circle, a triangle and a pentagon respectively. The solid and dashed lines represent respectively experiments without and with pre-crack. In each case, several sets of data are presented in order to show the reproducibility of the results. All experiments are carried out using gel material of shear modulus $\mu = 40$ kPa .

4. Video-micrographs depicting evolution of fracture in presence of pre-crack

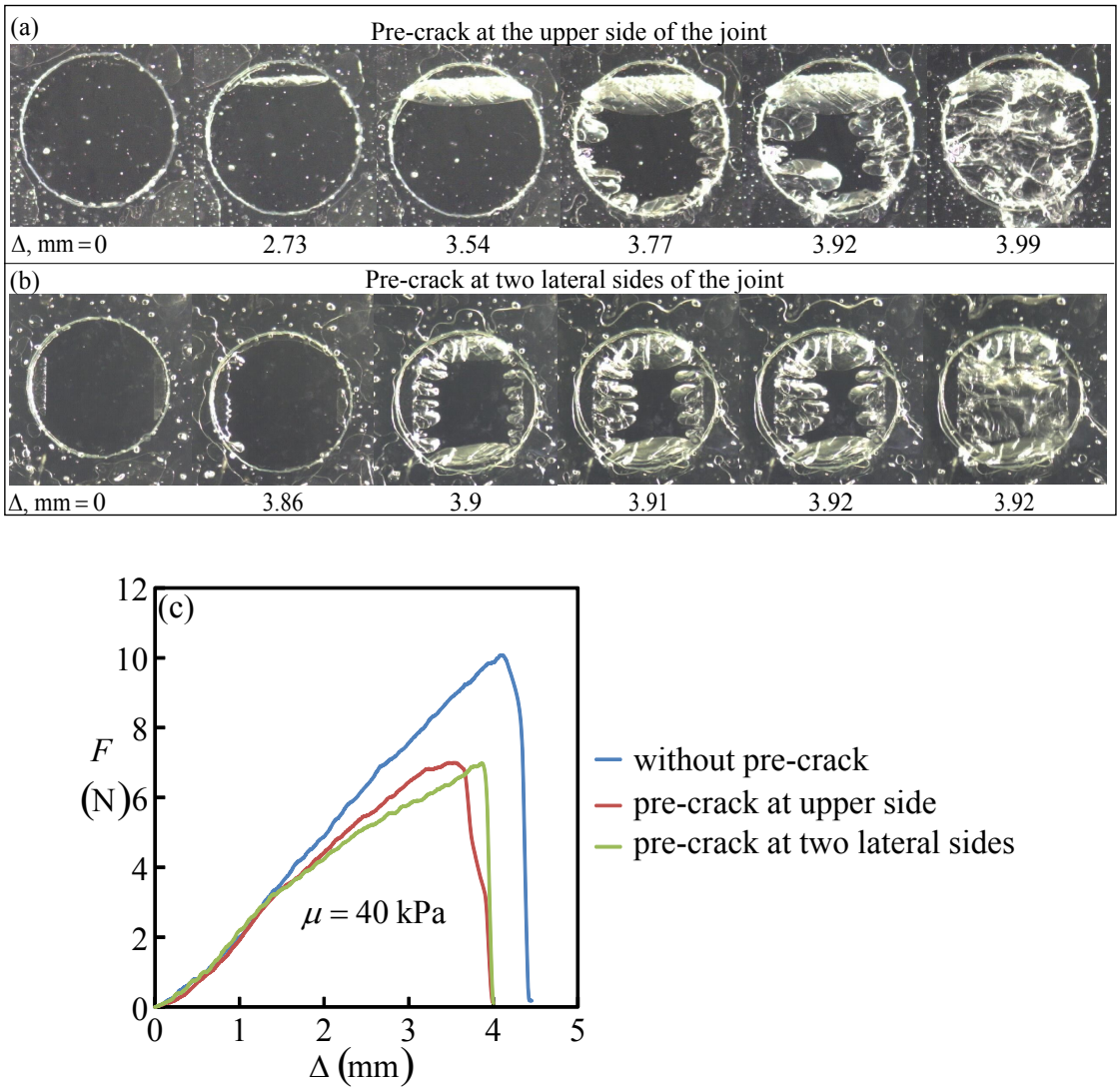

Figure S4: The fracture tests were carried out as in figure 1 using a disk joint having circular planar shape. A pre-crack was introduced in different manners: (a) at the upper side of the joint and (b) along the two lateral sides. The sequence of optical micrographs depict evolution of fracture along the plane of the joint. (c) The plot shows force vs displacement data from the respective experiments. Here we have plotted also the data for experiment in which no pre-crack was inserted before the fracture experiment.

5. Fracture triangular joint with two different orientations

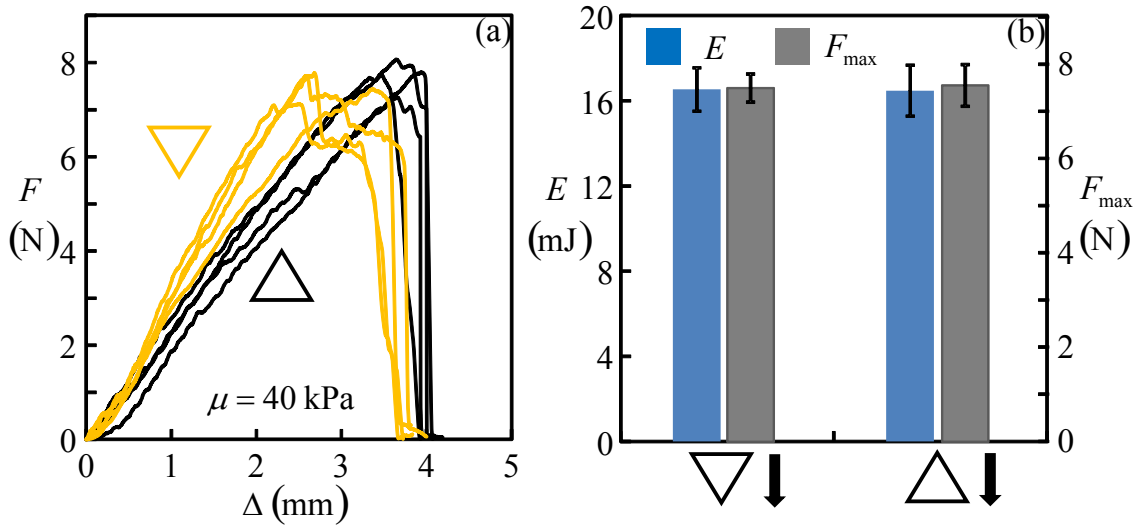

Figure S5. The fracture tests were carried out using disk joint having triangular planar shape with two different orientations. (a) The plot shows the force vs. displacement data. (b) The bar chart shows the maximum fracture load F_{max} and energy released due to fracture, E for these two orientations of the joint. Each set of experiments were repeated several times in order to examine the reproducibility of the data.

6. Effect of aspect ratio of rectangular disk joints.

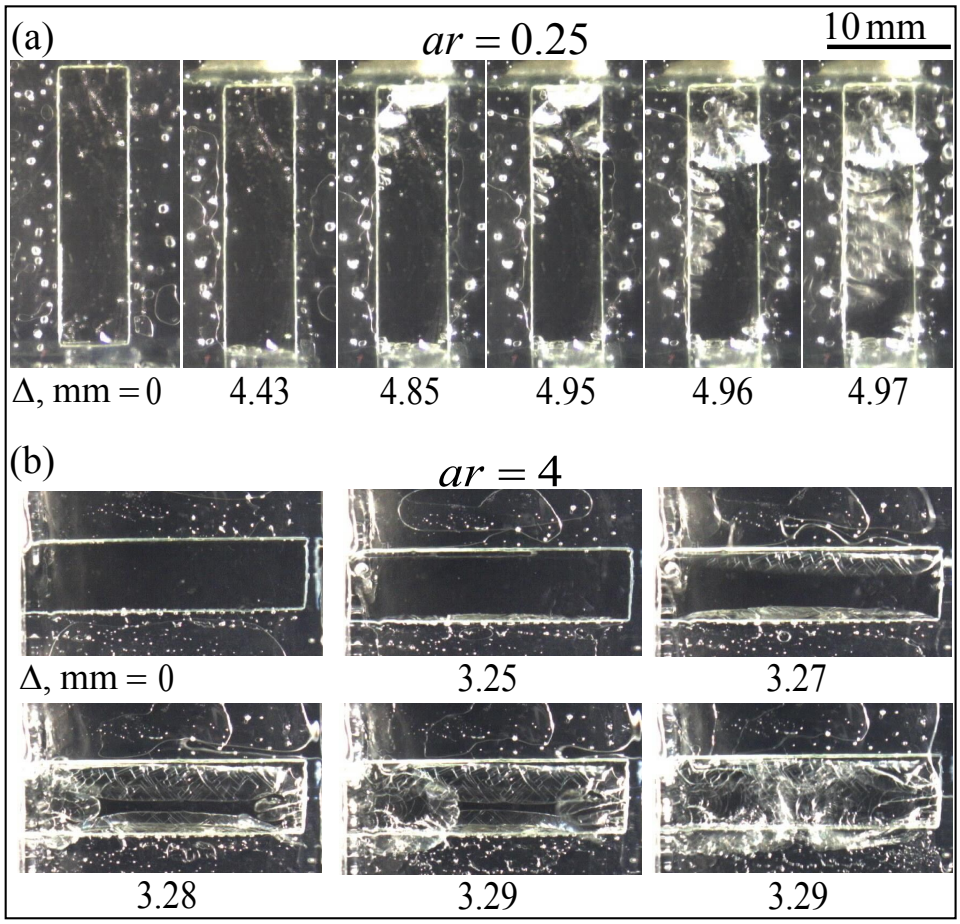

Figure S6. Fracture of rectangular joints having different aspect ratio. (a, b) The figure depicts fracture of gel block (shear modulus, $\mu = 40$ kPa) in which rectangular disks of aspect ratio 0.25 and 4 respectively are used for joining the two sides of the gel. The fracture experiment is carried out as in figure 1(b). The sequence of micrographs depict progress of fracture at different vertical displacement of hanging side of the block.