



S3 Fig. A. Three overlapping shapes, each has the same area and initial excess ratio $ER=4$. The shapes were prescribed to have different number of folds: 20 (yellow), 40 (red), 50 (blue). The blue shape has smaller local radius along the perimeter which results in higher bending energy. B. Three overlapping shapes, each has the same area and number of folds, $N=40$. The shapes have different initial excess ratio: 6 (yellow), 4 (red), 2 (blue). The blue shape has smaller local radius along the perimeter which results in higher bending energy. C. Plot of bending energy for simulated shapes with different ER s and number of folds. D. Plot of area stored in BLiPs for different shape configurations.