Supplementary Information

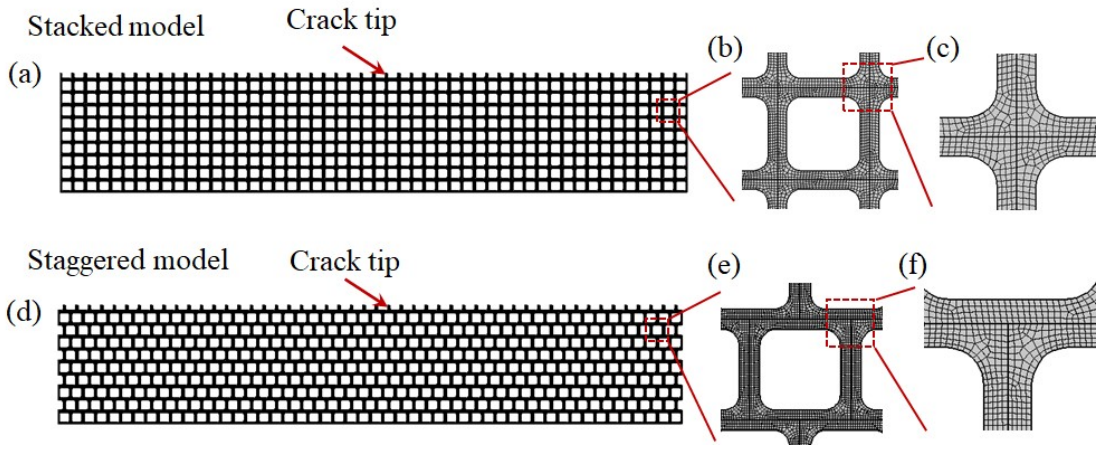

Fig. S1. Typical meshes used in FEM simulations of polymer networks. (a–c) Stacked pore model. (d–f) Staggered pore model.

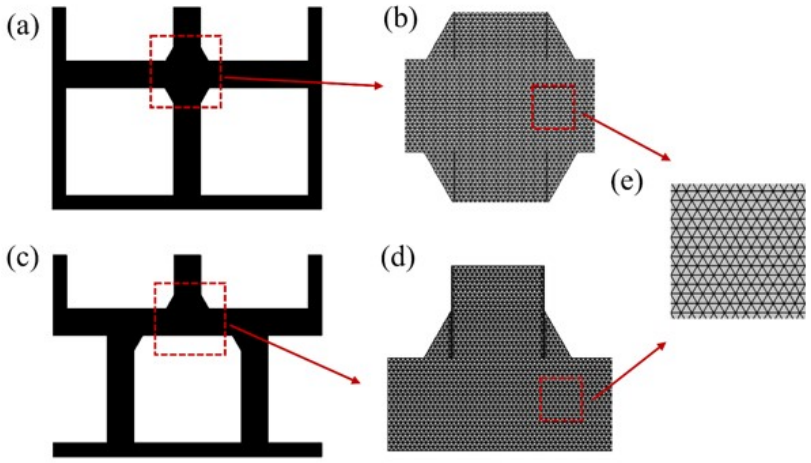

Fig. S2. Polymer chain networks in stacked (a–b) and staggered (c–d) models, where each line represents an individual polymer chain (e).

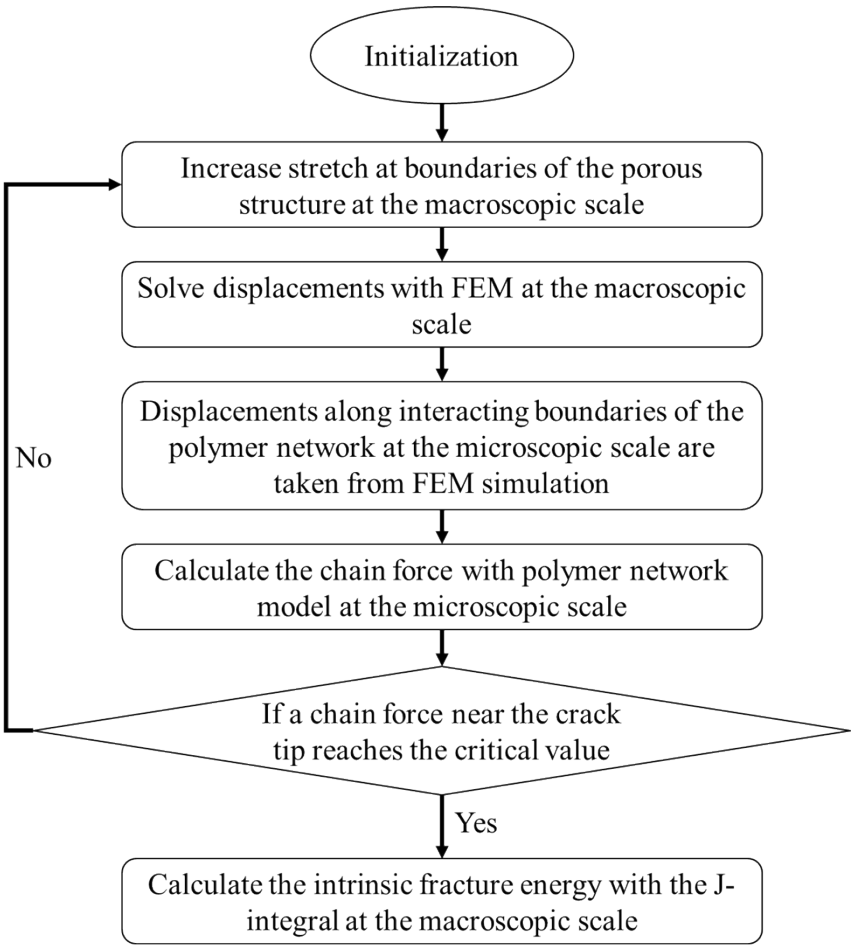

Fig. S3. Flowchart of the simulation scheme used to calculate the intrinsic fracture energy of porous soft materials.

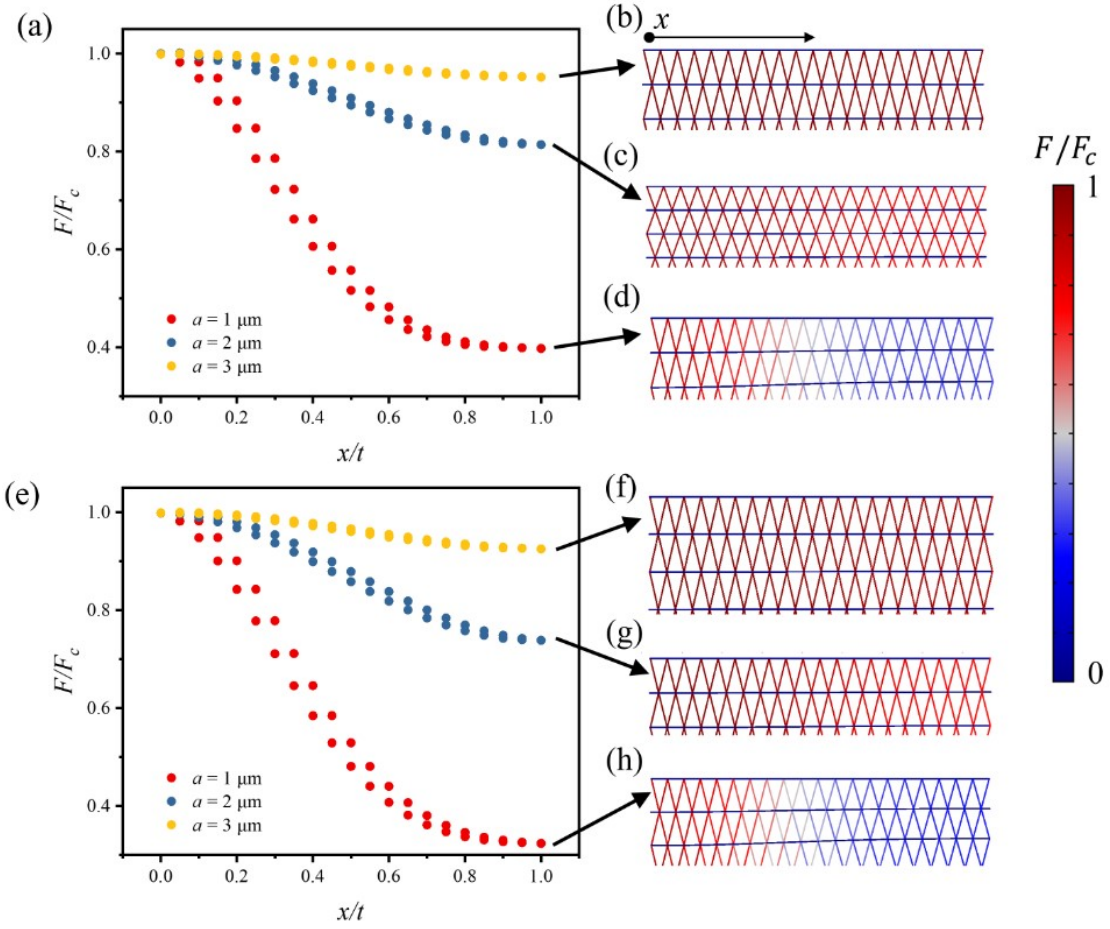

Fig. S4 Distribution of chain forces within the wall closest to the crack tip for the stacked model (a-d) or the staggered model (e-h) with varying pore sizes.