Supplementary Materials

Figure S1 Plectin$^{+/+}$ and plectin$^{-/-}$ cells exhibit similar recruitments of focal adhesion proteins and actin to magnetic beads. GFP-zyxin and mCherry-actin were transfected to plectin$^{+/+}$ and plectin$^{-/-}$ cells for 24 hrs. RGD-coated magnetic beads were bound to either plectin$^{+/+}$ cells (upper panel) or plectin$^{-/-}$ cells (lower panel) for the same duration of 15 min. There are no apparent differences in GFP-zyxin or mCherry-actin recruitments to the beads between the two cell types (white arrows), suggesting that the less stiffness and the lack of long distance force propagation in plectin$^{-/-}$ cells are not due to different bead engagements in these cells. Scale bars = 10 μm.

Figure S2 A representative plectin$^{+/+}$ cell (left, top panel) and a plectin$^{-/-}$ cell (left, bottom panel) were transfected with YFP-mitochondria (right images) and plated under identical conditions. The black dot in each left image is a magnetic bead (~4 μm in diameter). Although both types of cells express YFP-mitochondria, their stress propagation behaviors are different under the same mechanical loading (see Fig. 2 in the main text).

Figure S3 Plectin$^{-/-}$ cells (left, brightfield images) were co-transfected with a constitutively active RhoA (RhoA-V14) (top panel), a dominant negative RhoA (RhoA-N19) (middle panel), or an empty vector (bottom panel) and with mCherry-tubulin (right images). The transfection efficiency of different RhoAs in each cell was similar and mCherry-tubulin was similarly expressed in each type of the transfected cells. However,

only RhoA-V14 transfected plectin$^{-/-}$ cells, but not the RhoA-N19 (nor empty-vector) transfected plectin$^{-/-}$ cells, restored long distance force propagation behavior like the plectin$^{+/+}$ cells (see Fig. 7, and compare with Fig. 2). The black dot in each left image is a magnetic bead. Scale bars=20 μm.