**Supporting information**

**Supplementary Fig. 1. Partial statistical results comparing calcium influx in the control group, Ca2+-free group, and GsMTx4 pretreatment group at static and after Yoda1 treatments.** (A-C) Partial statistical results of relative fluorescence intensity at different time points at static conditions and after Yoda1 treatments in the three groups. (D-E) Partial statistical results of relative fluorescence intensity at different time points at static conditions and after Yoda1 treatments, longitudinally comparing the three groups. All values were presented as mean ± SD.

**Supplementary Fig. 2. Partial statistical results of changes in Ca2+ influx induced by short-duration stretch stimulation at 0.25 and 1.0Hz frequencies:** (A) Partial statistical results of relative fluorescence intensity induced by short-duration (0/0.5/1/2/4 minutes) stretch stimulation at 0.25Hz. (B) Partial statistical results of relative fluorescence intensity induced by short-duration (0/0.5/1/2/4 minutes) stretch stimulation at 1.0Hz. All values were presented as mean ± SD. \*: p < 0.05.

**Supplementary Fig. 3. Partial statistical results of changes in Ca2+ influx under static conditions and after Yoda1 treatments in the NC and Sh-Piezo1 groups:** (A) Static. (B) Yoda1 stimulation. All values were presented as mean ± SD.

**Supplementary Fig. 4. qPCR results of Piezo2, KCNK2, and TEME63A/B at different time points after short stretch stimulation (0.5Hz, 10%):** (A) Piezo2 qPCR results at different time points after stretching for 2, 5, 10, and 15 minutes. (B) Comparison of Piezo2 qPCR results at the same time points after stretching for 2, 5, 10, and 15 minutes. (C) TRPV4 KCNK2 and TEME63A/B qPCR results at different time points after stretching for 2, 5, 10, and 15 minutes. (D) Comparison of TRPV4 KCNK2 and TEME63A/B qPCR results after stretching for 2, 5, 10, and 15 minutes at the same time points. n = 3, and the separate asterisks, relative to control group or 2-min group. All values were presented as mean ± SEM. \*: p < 0.05, \*\*: p < 0.01; \*\*\*: p < 0.001.