

## Supplemental Figure Legends

**Fig. S1.** Epithelial and mesenchymal markers are not spatially patterned in epithelial sheets in the absence of TGF $\beta$  treatment. **(A)** Immunofluorescence image of cytokeratins (red) and DNA (blue). Frequency maps of **(B)** cytokeratins, **(C)**  $\alpha$ SMA and **(D)** vimentin. Scale bars, 25  $\mu$ m.

**Fig. S2.** TGF $\beta$  signaling is evenly distributed over epithelial sheets. Shown are TGF $\beta$ -treated sheets stained for **(A)** TGF $\beta$ RII, **(B)** DNA, and **(C)** pSmad1/5/8. Scale bars, 25  $\mu$ m.

**Fig. S3.** Mammary epithelial sheets generate mechanical forces by cytoskeletal contraction. **(A)** Epithelial sheet cultured on polyacrylamide gel with embedded fluorescent microbeads (red). **(B)** Average bead displacement map for five epithelial sheets. Larger displacements correlate with greater stresses. Scale bars, 25  $\mu$ m.

**Fig. S4.** Inhibiting signaling through the small GTPase Rac has no effect on spatial patterning of TGF $\beta$ -mediated EMT. Immunofluorescence images of F-actin in mammary epithelial cells treated with epidermal growth factor (4 nM) and **(A)** vehicle control or **(B)** the Rac inhibitor NSC23766 (100  $\mu$ M). Immunofluorescence images and frequency maps of  $\alpha$ SMA expression in **(C,E)** control and **(D,F)** NSC23766-treated epithelial sheets. Scale bars, 25  $\mu$ m.

**Fig. S5.** Nuclear localization of SRF is even across epithelial sheets. **(A)** Immunofluorescence image and **(B)** frequency map of SRF in control epithelial sheets. **(C)** Immunofluorescence image and **(D)** frequency map of SRF in TGF $\beta$ -treated epithelial sheets. Scale bars, 25  $\mu$ m.

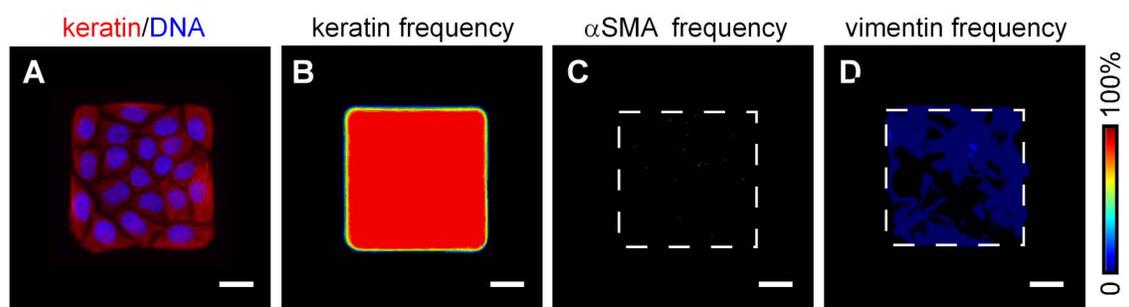
**Fig. S6.** Treatment with cytochalasin D results in EMT over the entire epithelial sheet.

Immunofluorescence images and frequency maps for **(A,B)** cytokeratins and **(C,D)**  $\alpha$ SMA. Scale bars, 25  $\mu$ m.

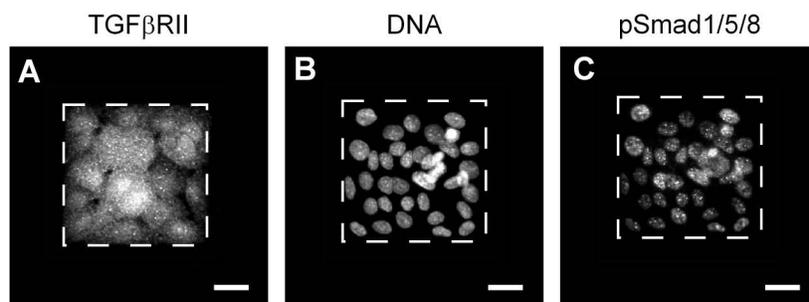
**Fig. S7.** EMT is spatially patterned in epithelial sheets of NMuMG epithelial cells. **(A)**

Immunofluorescence image and **(B)** frequency map of  $\alpha$ SMA in TGF $\beta$ -treated sheets. Frequency maps of  $\alpha$ SMA in NMuMG sheets transduced with **(C)** Ad-GFP or **(D)** Ad-E $\Delta$  and simultaneously treated with TGF $\beta$ . Frequency maps of **(E)** nuclear localized MRTF-A and **(F)**  $\alpha$ SMA in NMuMG sheets transfected with MRTF-A- $\Delta$ N construct and treated with TGF $\beta$ . Scale bars, 25  $\mu$ m.

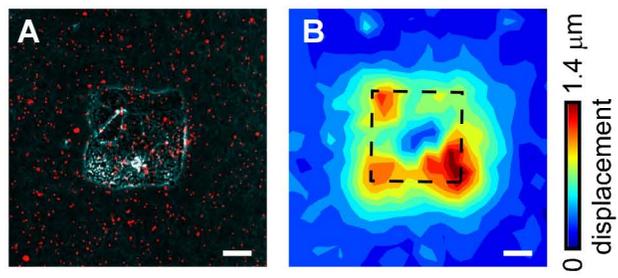
**Figure S1**



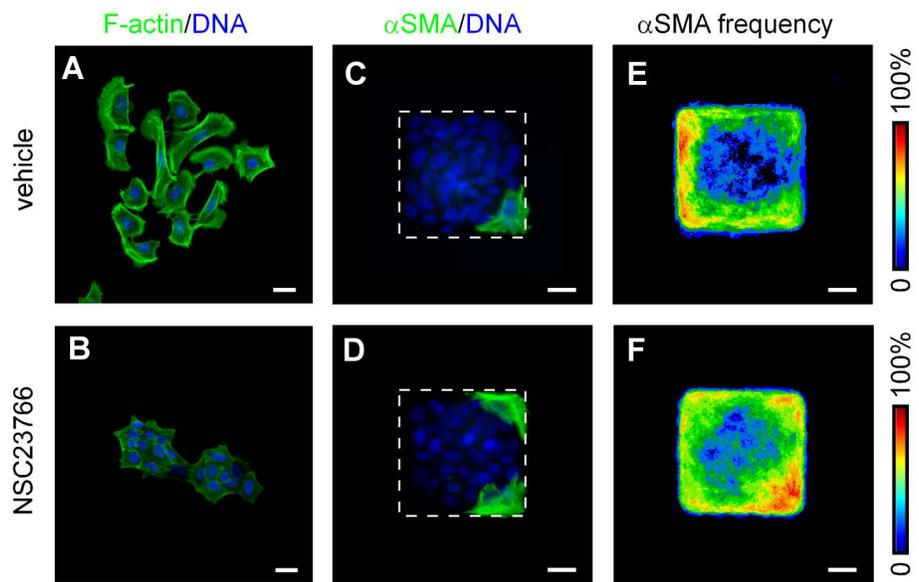
**Figure S2**



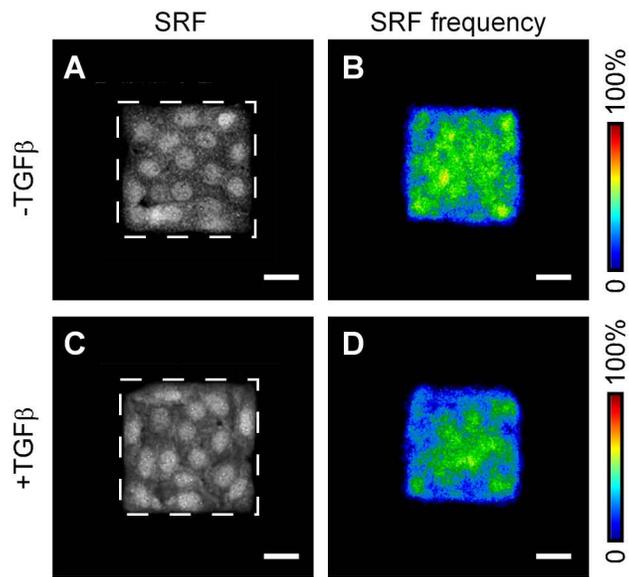
**Figure S3**



**Figure S4**



**Figure S5**



**Figure S6**

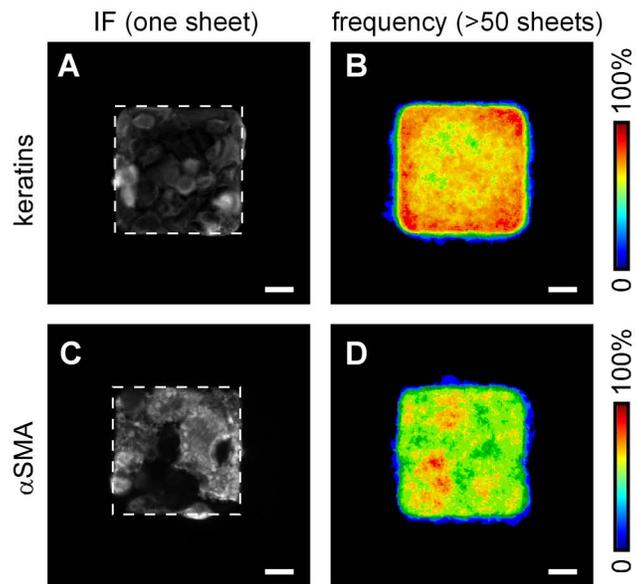


Figure S7

