

# Piezo1 integration of vascular architecture with physiological force

# Piezo1's role in endothelial cell regulation

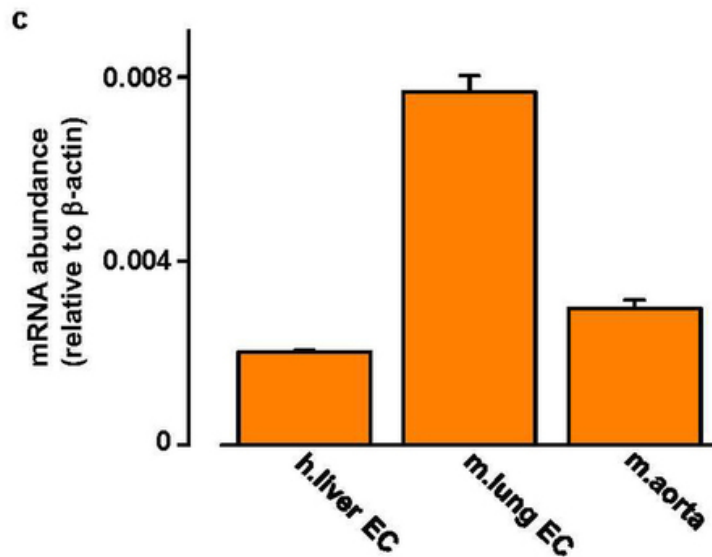
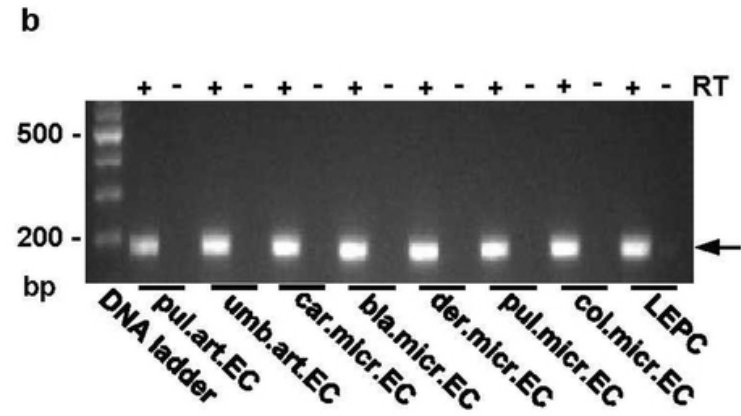
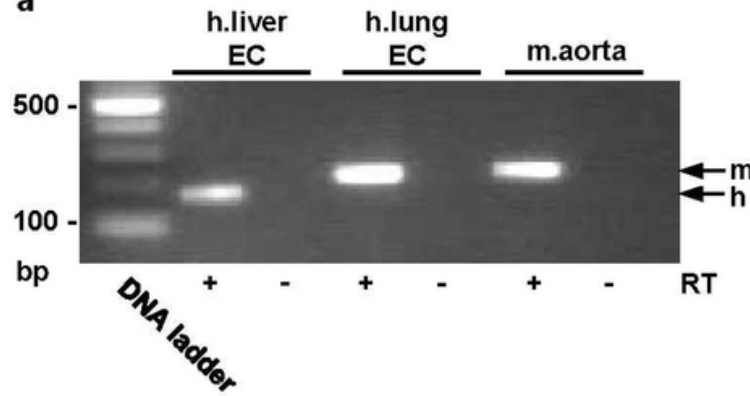
Piezo proteins as subunits of Ca<sup>2+</sup> permeable cationic channels

Piezo1 channels as sensors of shear stress

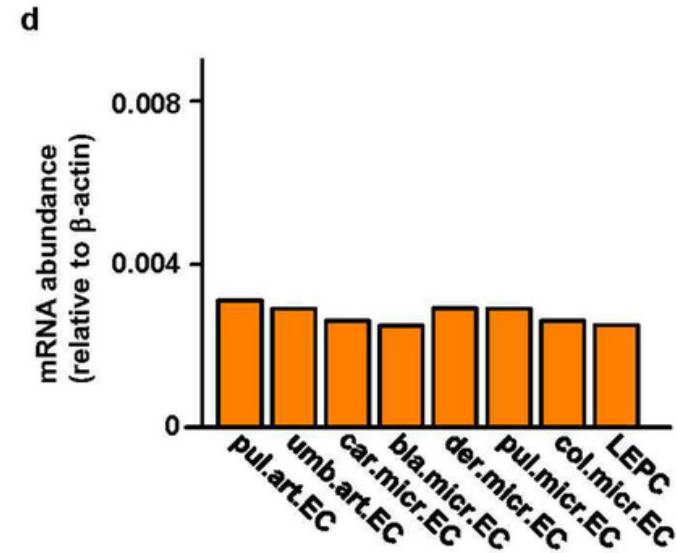
Piezo1 channels determinants of vascular structure

# Piezo1 mRNA in aorta and endothelial cells

Ext. Fig. 1 a



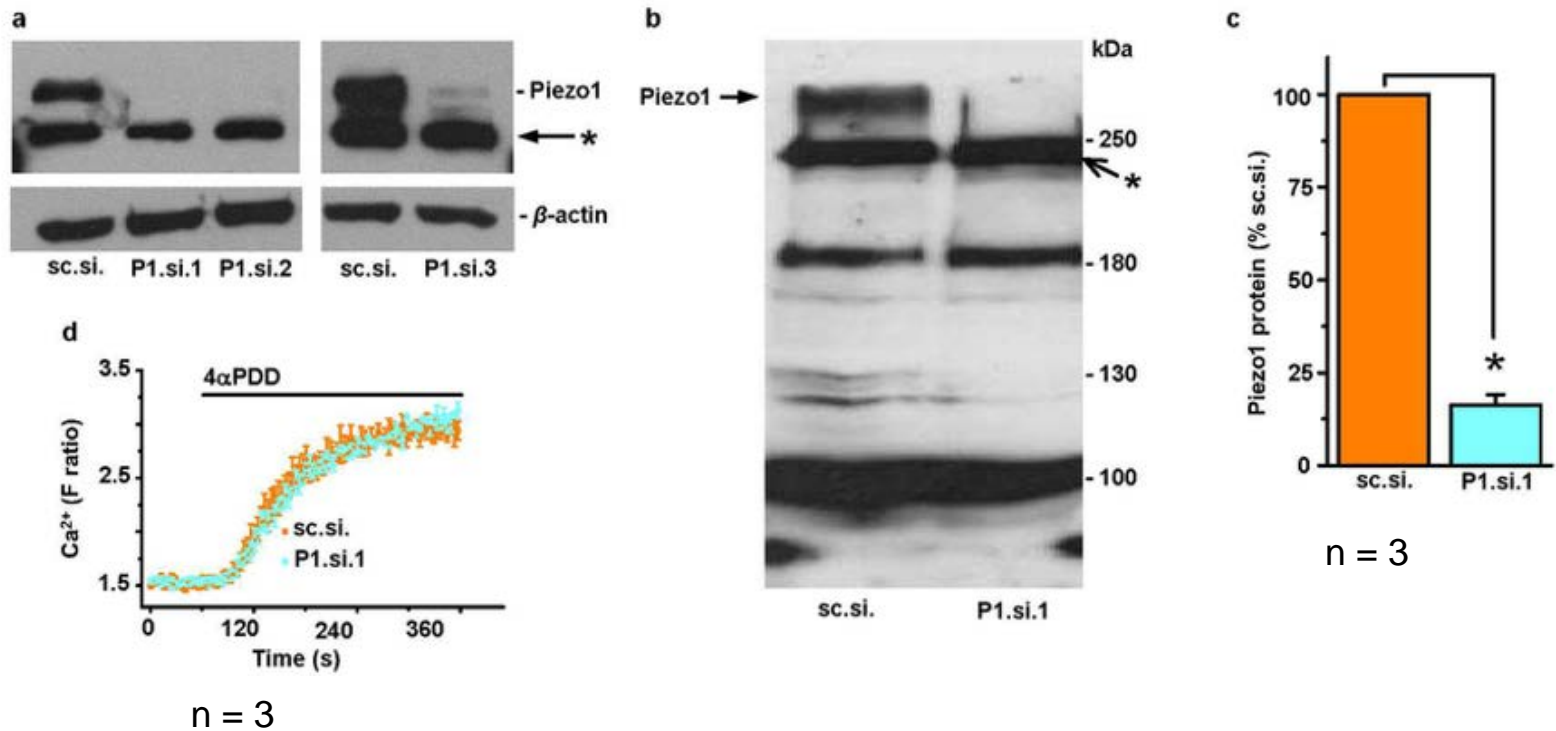
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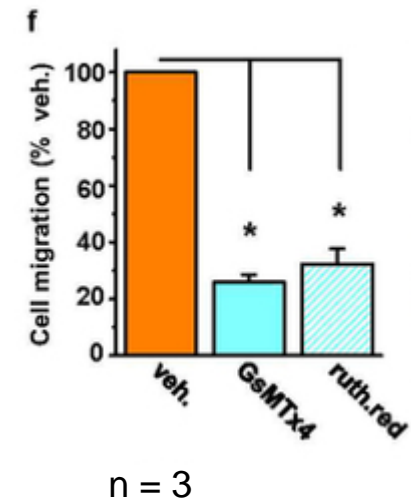
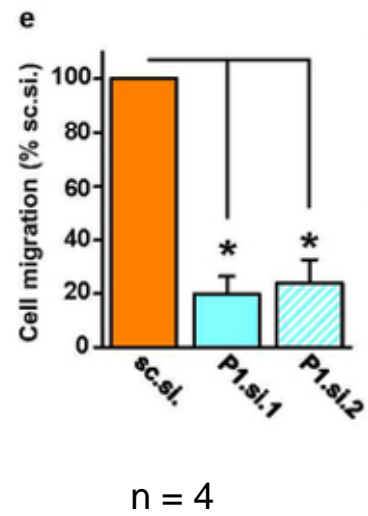
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# HUVEC: cultured human umbilical vein endothelial cells

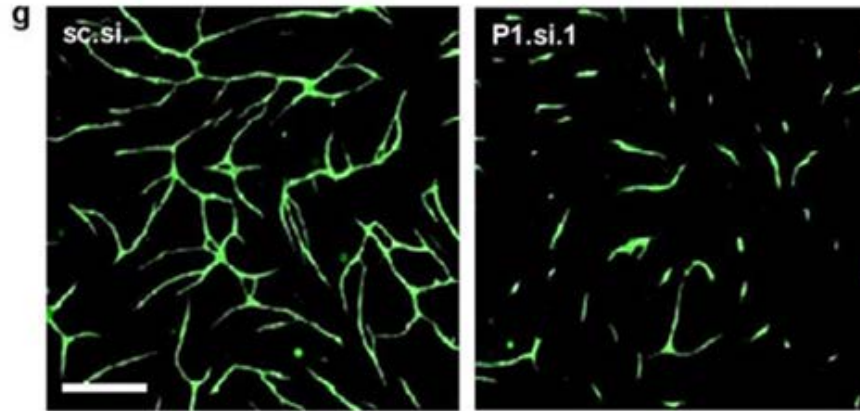
Ext. Fig. 2



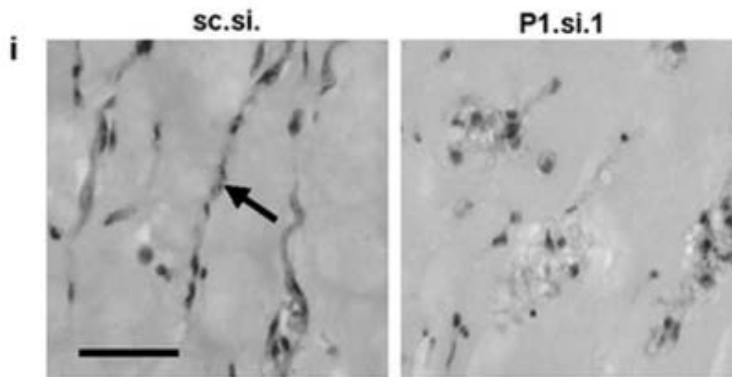
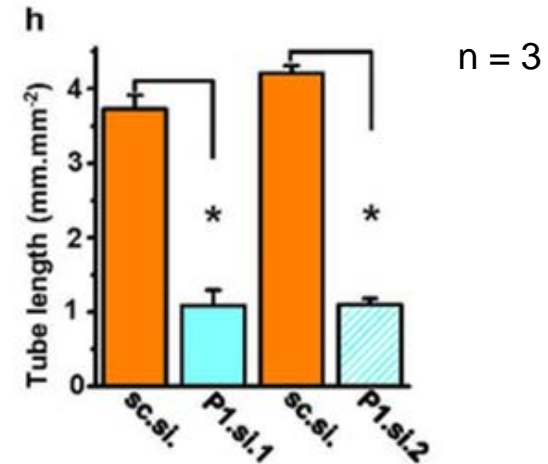
Ext. Fig. 2



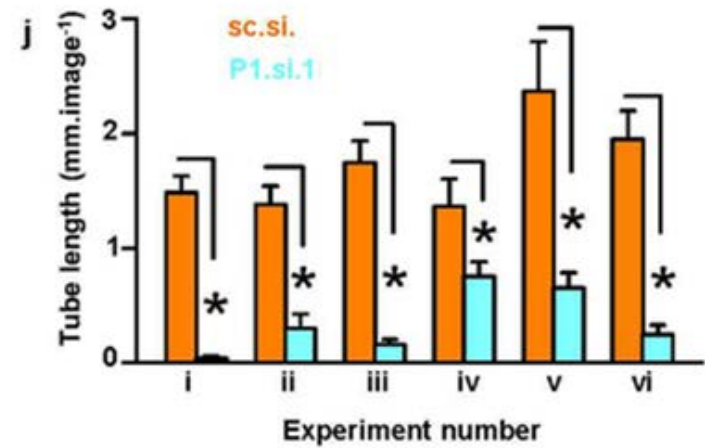
Ext. Fig. 2



Scale bar, 400  $\mu\text{m}$ .

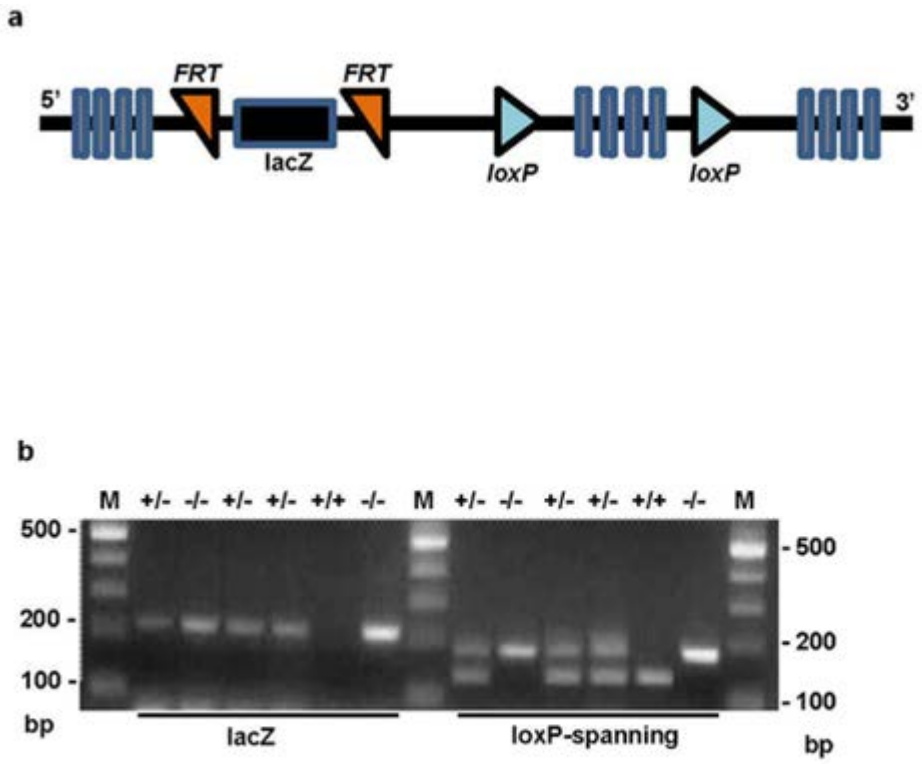


Scale bar, 50  $\mu\text{m}$ .



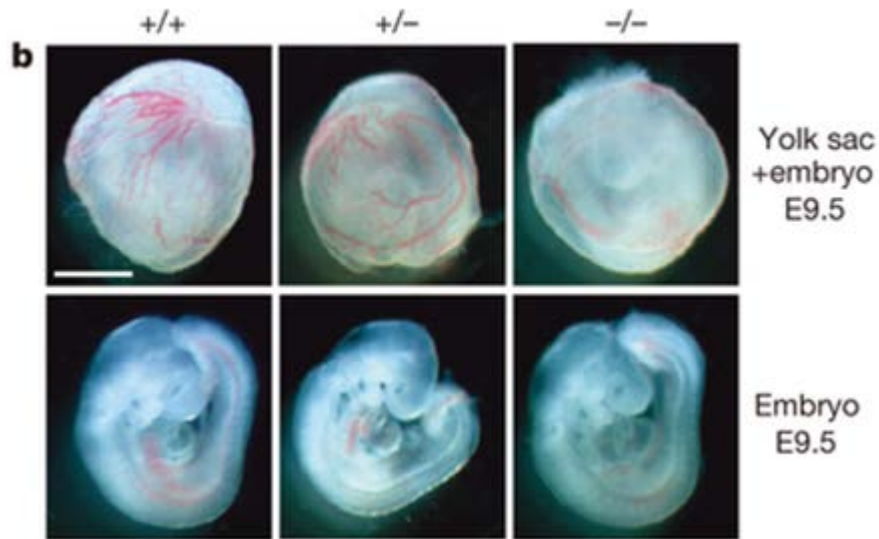
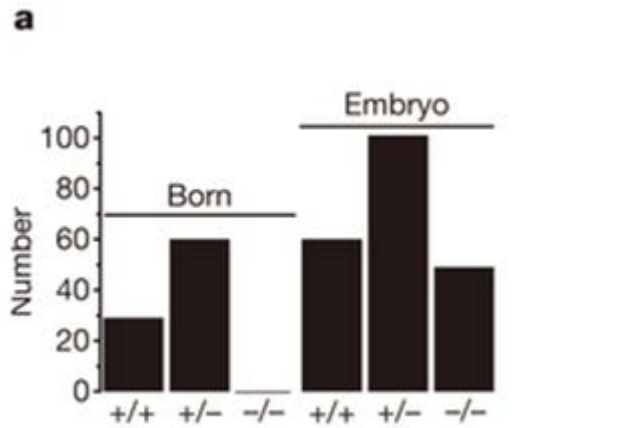
## Global and endothelial-specific Piezo1 modification

Ext. Fig. 3 a



# Piezo1 function in murine embryos

Fig. 1



Scale bar, 1 mm.

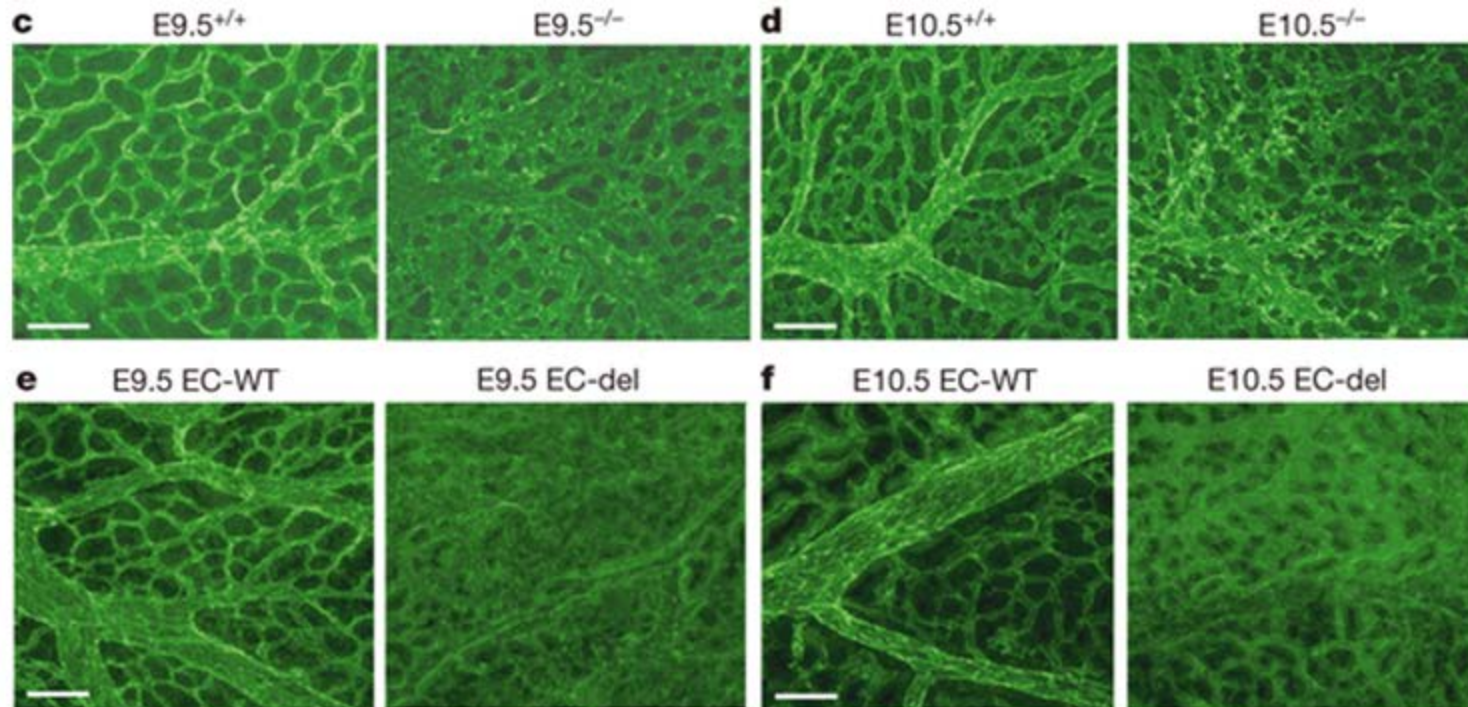
Ext. Fig. 3





# Images of dissected *Piezo1*<sup>+/+</sup> and *Piezo1*<sup>-/-</sup> yolk sacs stained for CD31

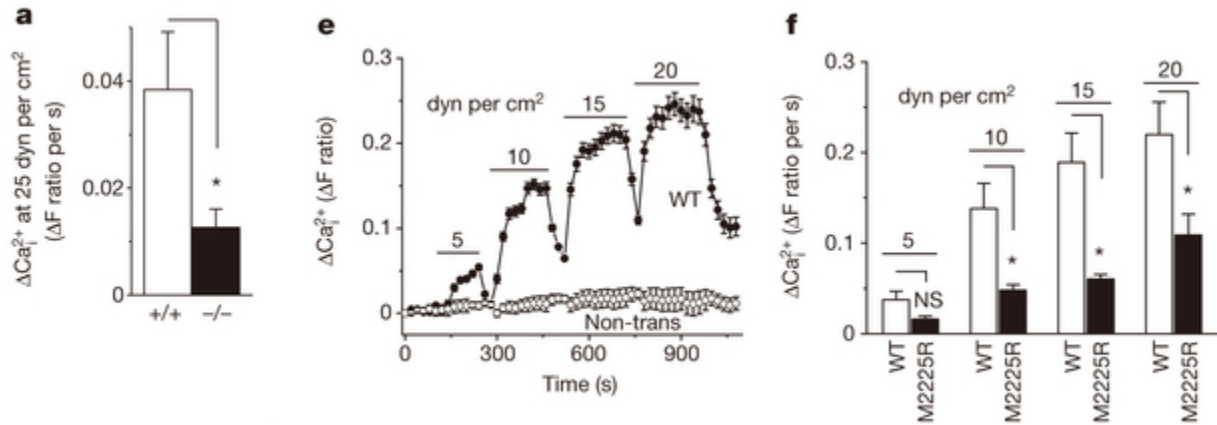
Fig. 1



Scale bars, 100  $\mu$ m.

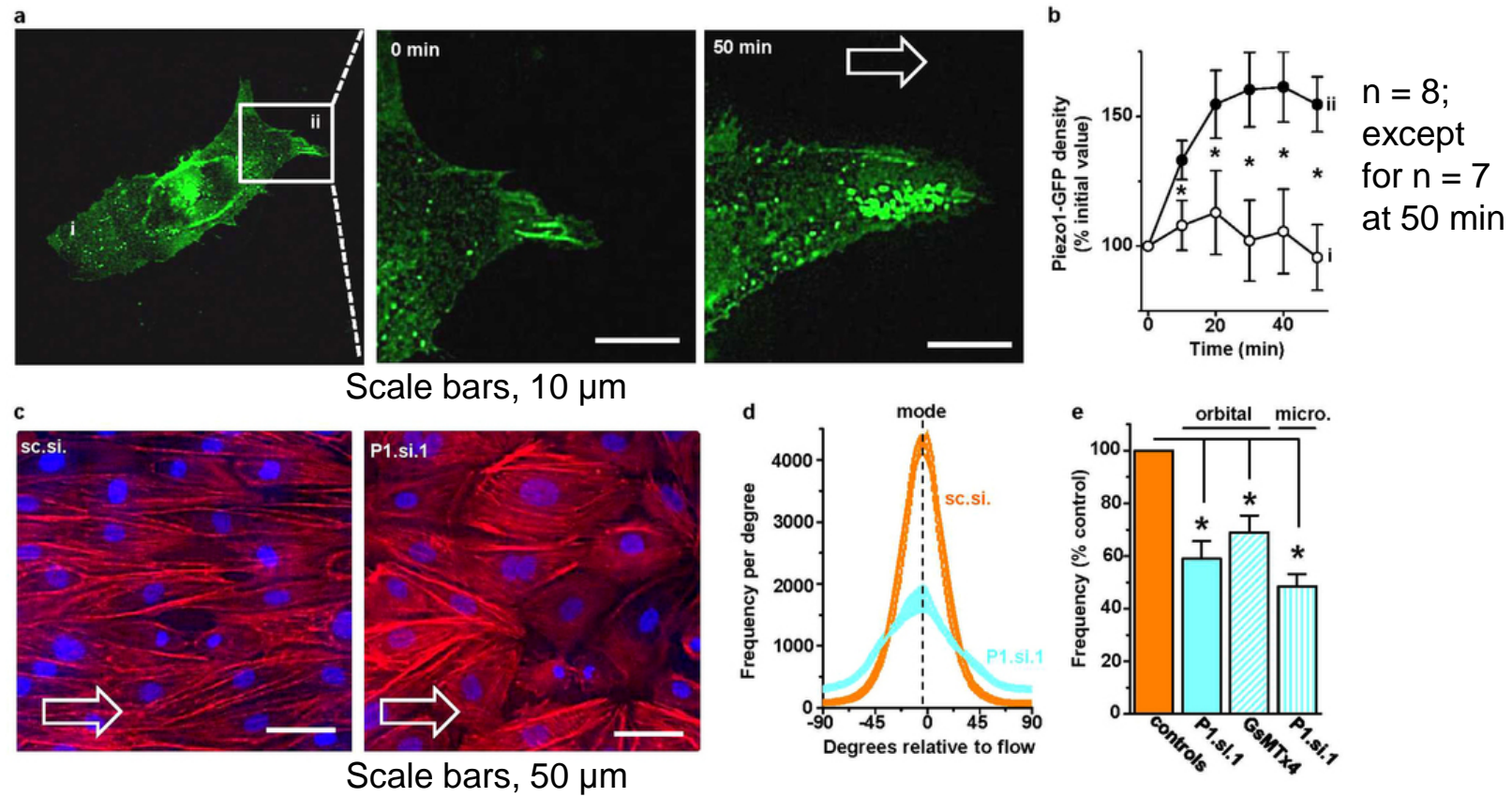
# Piezo1 in shear stress sensing

Fig. 2



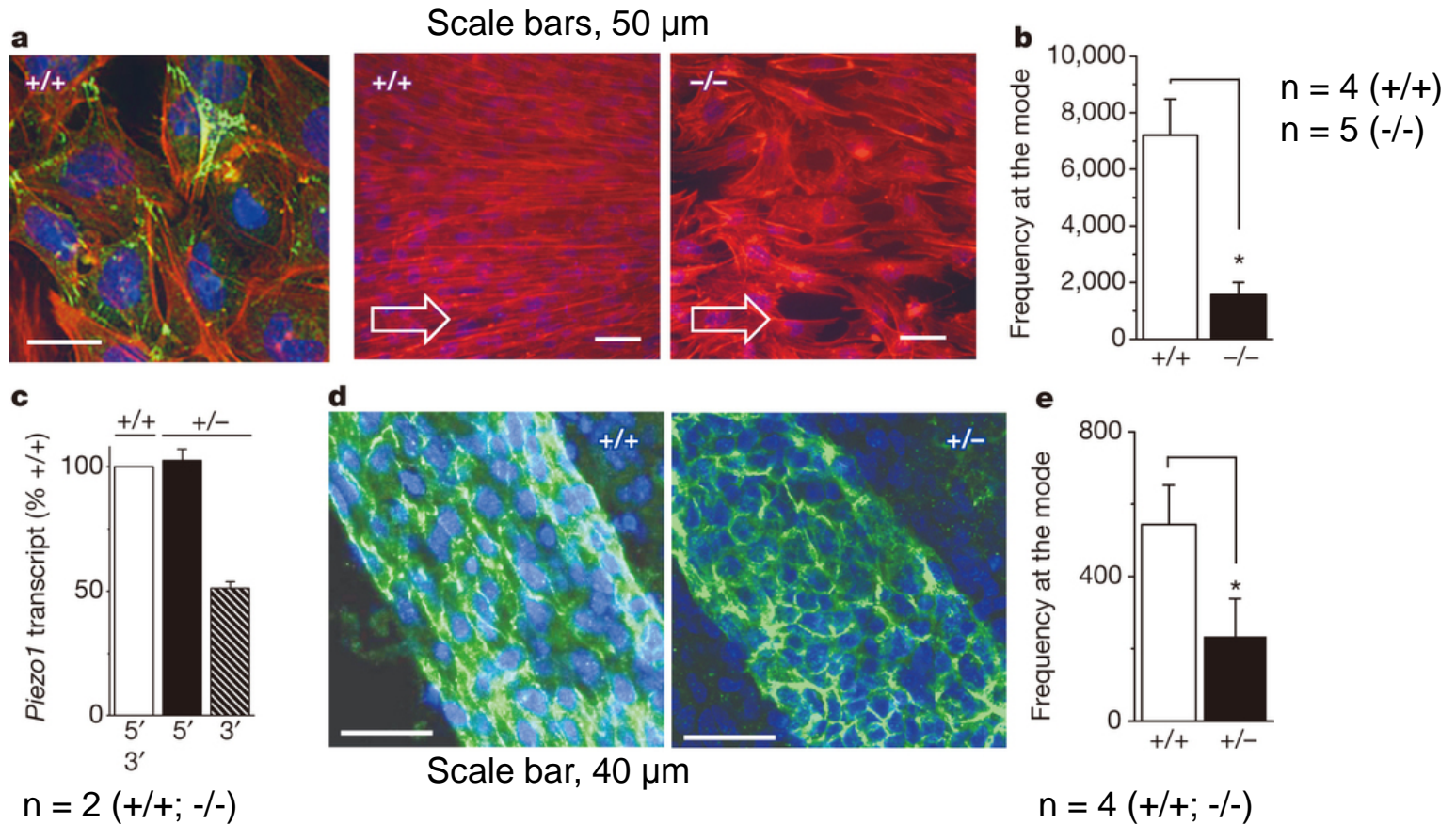
# Shear-stress-evoked redistribution of Piezo1 and the role of Piezo1 in alignment of endothelial cells to the direction of shear stress

Ext. Fig. 6



# The role of Piezo1 in endothelial cell alignment

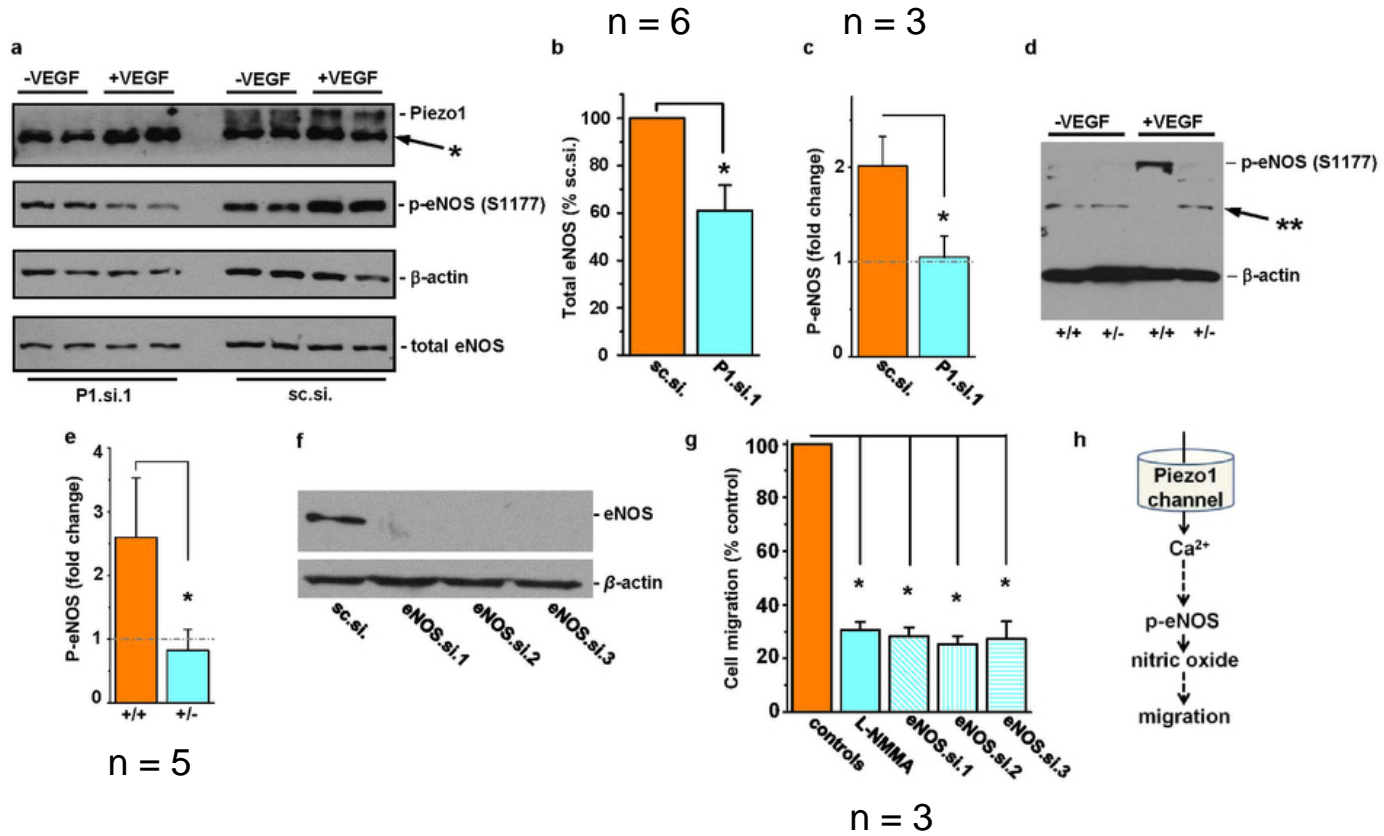
Fig. 3





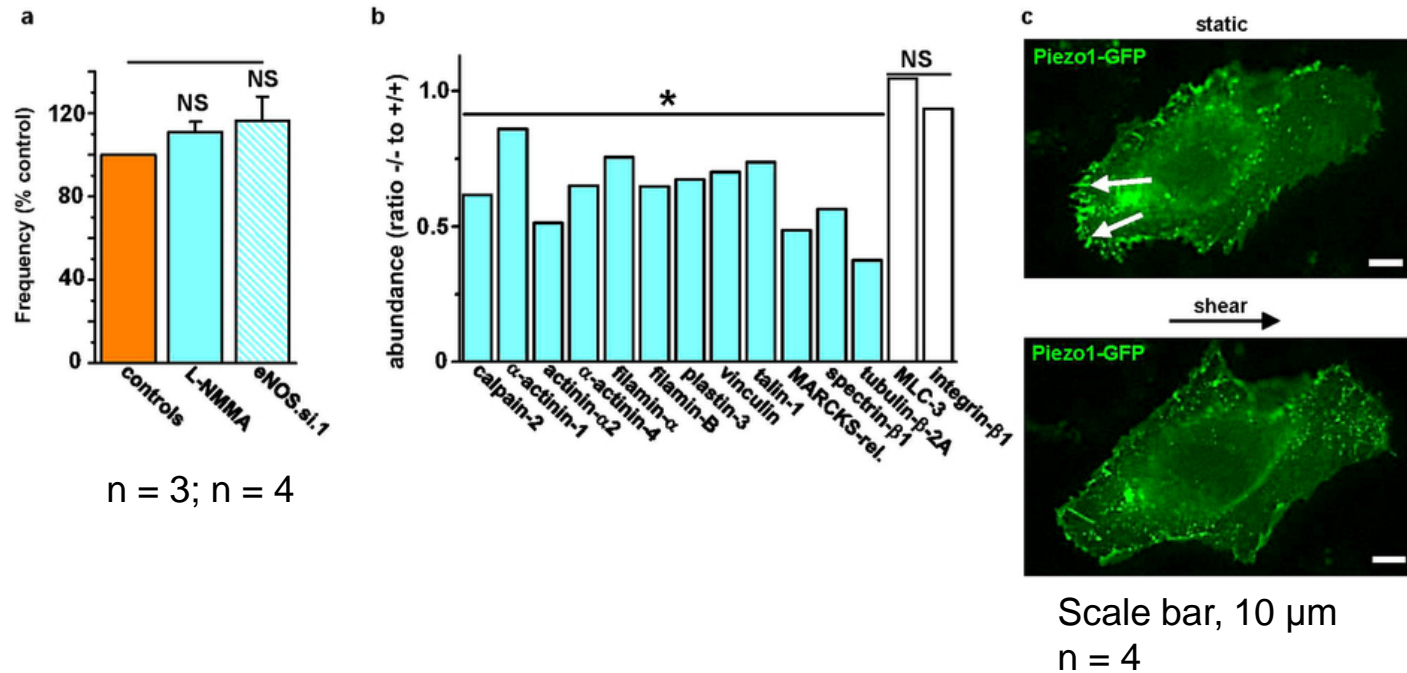
# Coupling to endothelial nitric oxide synthase

Ext. Fig. 7



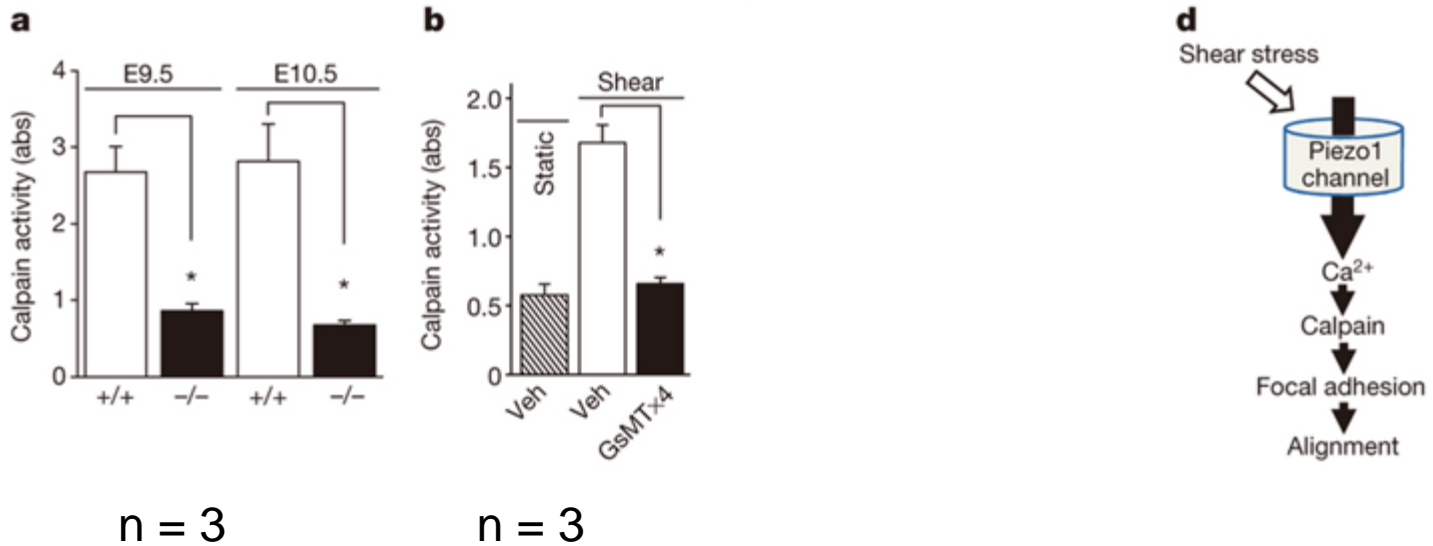
# Endothelial cell alignment to shear stress lacks dependency on nitric oxide but is coupled to calpain

Ext. Fig. 8



# Piezo1 coupling to calpain

Fig. 4



Thank you!