Supplemental Materials

Molecular Biology of the Cell

Osborne et al.

Supplementary Figure. 1. Compliance signatures, stiffness and stiffness response of TGF-β induced EMT in PANC-1s, stiffness response of PDL-coated beads, and integrin levels during EMT

(A, B) Compliance signatures in full, non-stacked form, for representative examples of (A) cell stiffening and (B) cell softening. The stacked form of these plots are provided in Fig. 1C and 1D.

(C) PANC-1 cells were treated with (XXX amount) TGF-β for 72 hours to induce EMT. Average PANC-1 cell stiffness for untreated (n = 86) and TGF-β treated cells (n = 54). ** denotes stiffness difference relative to untreated cells at the $p < 0.01$ level.

(D) Average PANC-1 stiffness response for untreated (n = 20) and TGF-β treated (n = 10) cells. # denotes stiffness difference of G_x from G_1 at the $p < 0.05$ level.

* denotes stiffness response (G_x/G_1) difference between conditions at the $p < 0.05$ level. (Error bars represent SEM, data was collected from 3 independent experiments)

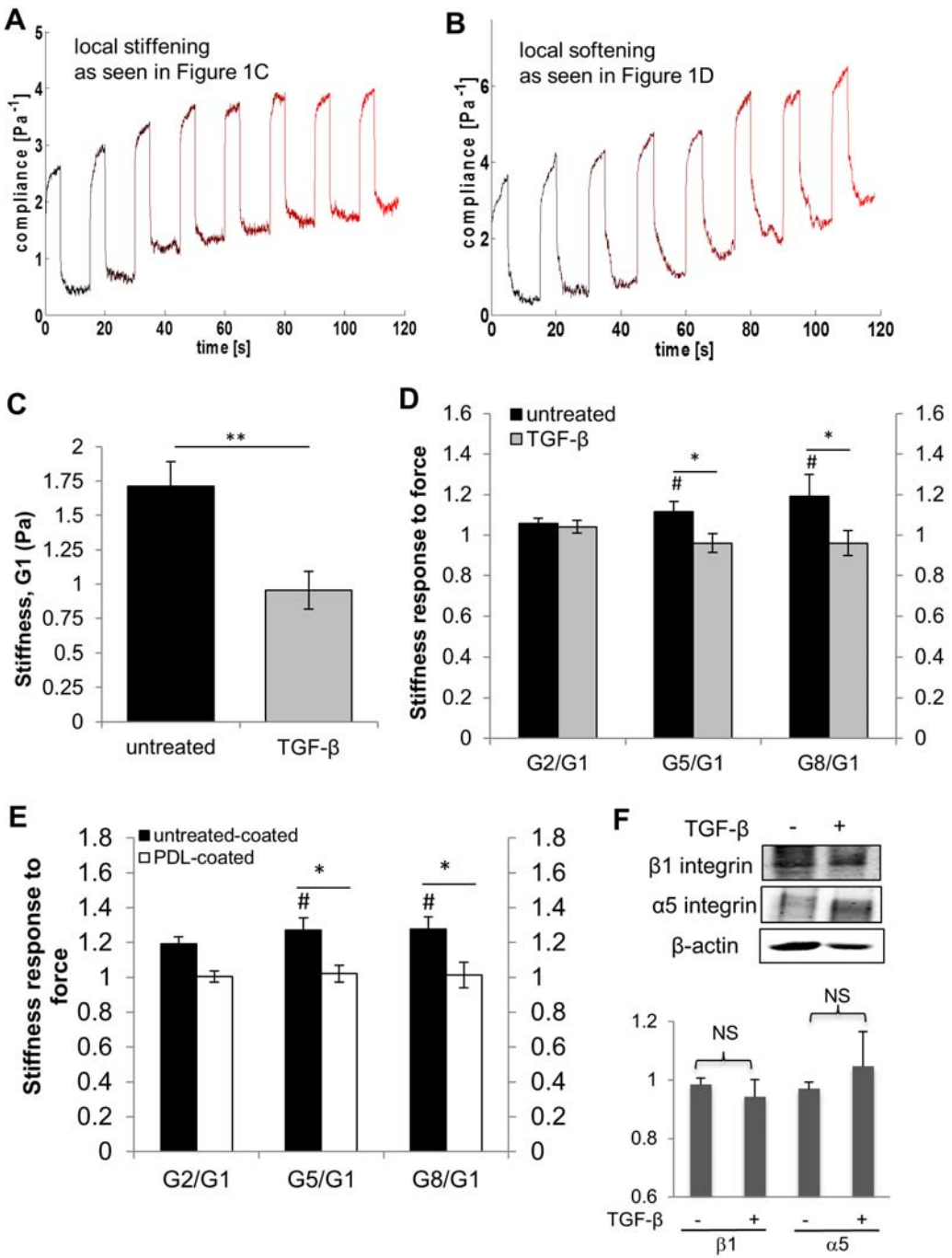
(E) Average stiffness response for NMuMG cells incubated with FN-coated (n = 30) or PDL-coated (n = 14) beads. # denotes stiffness difference of G_x from G_1 at the $p < 0.05$ level. * denotes stiffness response (G_x/G_1) difference between conditions at the $p < 0.05$ level. (Error bars represent SEM, data was collected from 3 independent experiments)

(F) Protein expression level of β1 and α5 integrin's in NMuMG cells with or without TGF-β treatment. Quantitation of levels from three independent trials is shown below. NS = No statistical difference.

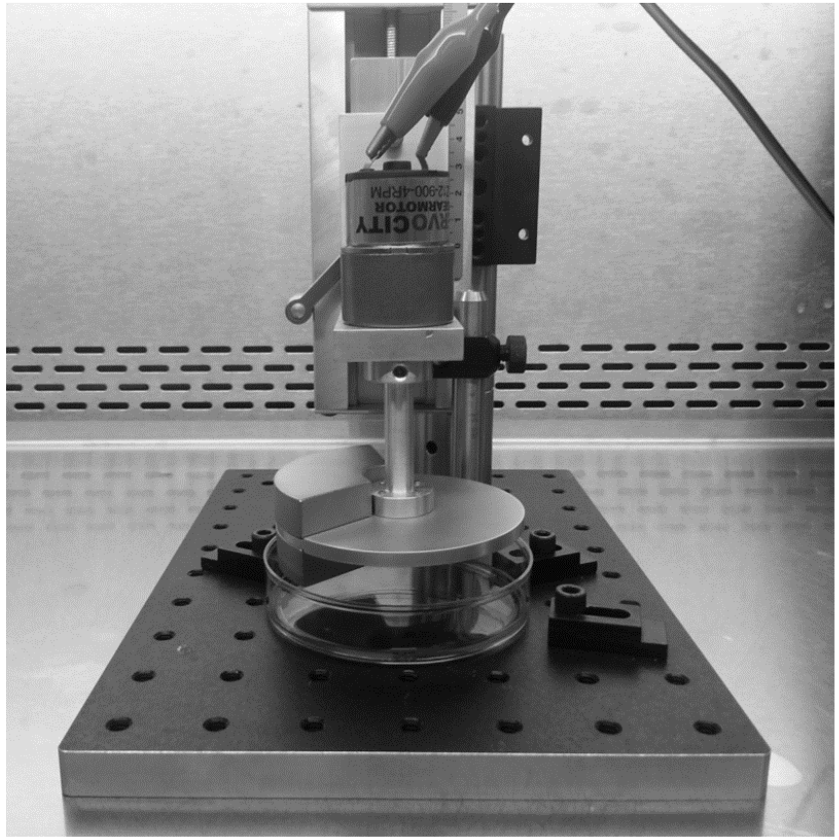
Supplementary Fig. 2. The rotating permanent magnet device

(A) Picture and schematic of the rotating magnet device. A DC motor was used to rotate a custom made, axially magnetized, 120-degree arc magnet at 4 revolutions per minute to generate a time varying force of the desired duty cycle and frequency. The footprint of the magnet was designed to lower into a standard 10 cm cell culture dish.

(B) COMSOL simulation of the force regimen over 2 min for the rotating magnet device at a height of 16 mm and at half-radius in the specimen dish.


A
local stiffening
as seen in Figure 1C
compliance [Pa-1]
time [s]
B
local softening
as seen in Figure 1D
compliance [Pa-1]
time [s]
C
Stiffness, G1 (Pa)
**
untreated
TGF-β
D
untreated
TGF-β
Stiffness response to force
*
*
#
#
G2/G1
G5/G1
G8/G1
E
untreated-coated
PDL-coated
Stiffness response to force
*
*
#
#
G2/G1
G5/G1
G8/G1
F
TGF-β - +
β1 integrin
α5 integrin
β-actin
NS
NS
TGF-β - + - +
β1
α5

A



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