Supporting Information

Of

Understanding Spatiotemporal Mechanical Behavior, Viscoelasticity, and Functions of Stem Cell-Derived Cardiomyocytes

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E' It is calculated based on **Equation S1**:

$$\frac{1}{E'} = \frac{(1 - \mu_{tip}^2)}{E_{tip}} + \frac{(1 - \mu_{hiPSC-CM}^2)}{E_{hiPSC-CM}}$$

(Equation S1)

where μ_{tip} and $\mu_{hiPSC-CM}$ are the Poisson's ratios of the probe (silicon, 0.28) and hiPSC-CM (0.45).

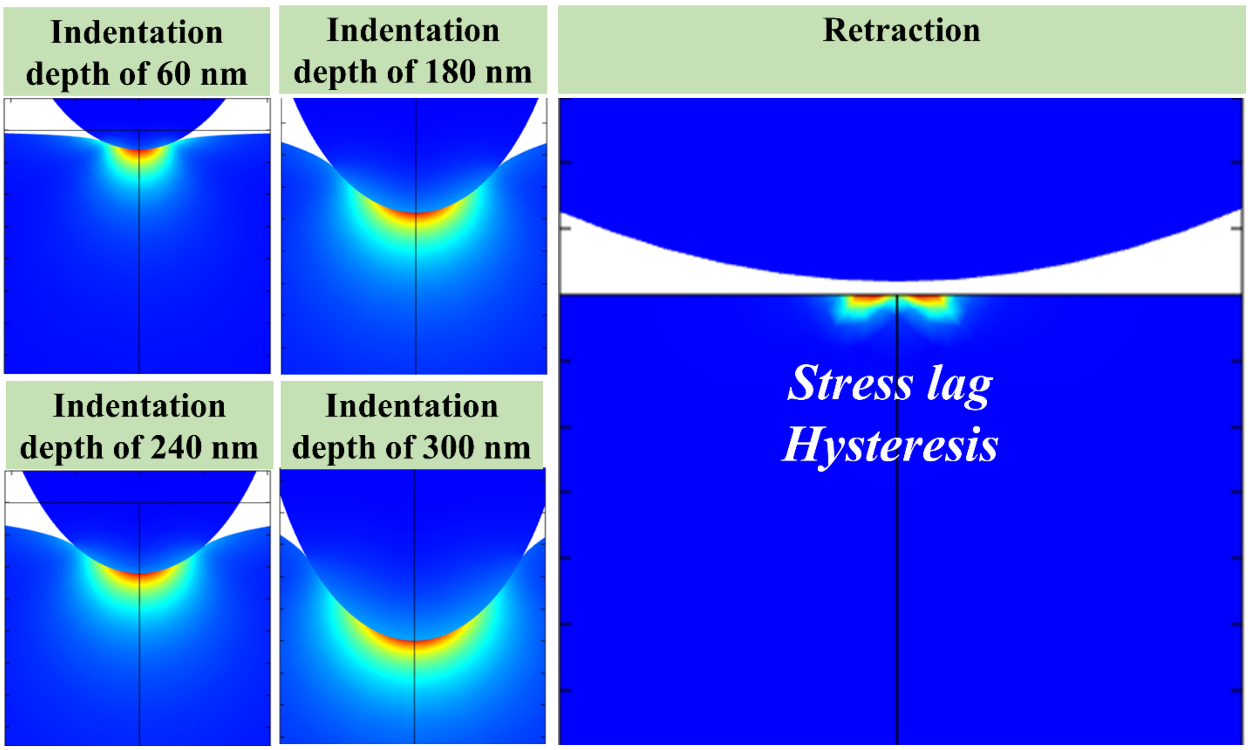

Figure S1. Qualitative COMSOL modeling of AFM nanoindentation on the hiPSC-CM surface and load distribution. Blue and green/yellow/red represent without and with stresses.

$$F(t) = \frac{4}{3\left(1 - \mu_{hiPSC-CM}^2\right)}\sqrt{R}d^{\frac{3}{2}}(t)E_0[g_\infty + g_1RCF_1 + g_2RCF_2 + g_3RCF_3]$$

(Equation S2)

where g_∞ is the normalized equilibrium modulus, g_i (i is 1, 2, or 3) is sample-related constant, and RCF_i is the ramp correlation factor, $RCF_i = \frac{\tau_i}{t_i}(e^{\tau_i/t_i} - 1)$, where τ_i is the finite ramp time.

$$s_c = 1 - \frac{\min(L_x,\ L_y)}{\max(L_x,\ L_y)}$$

(Equation S3)

where L_x and L_y are the x-directional and y-directional lengths of a cell.

$$\varepsilon(t) = \frac{\sigma_0}{E}(1 - exp(- (E/\eta)t))$$

(Equation S4)

where σ_0, E, and η are the stress, elastic modulus, and viscosity of the materials.