Electronic Supplementary Information

# Study of endothelial cell apoptosis using fluorescence resonance energy transfer (FRET) biosensor cell line with hemodynamic microfluidic chip system

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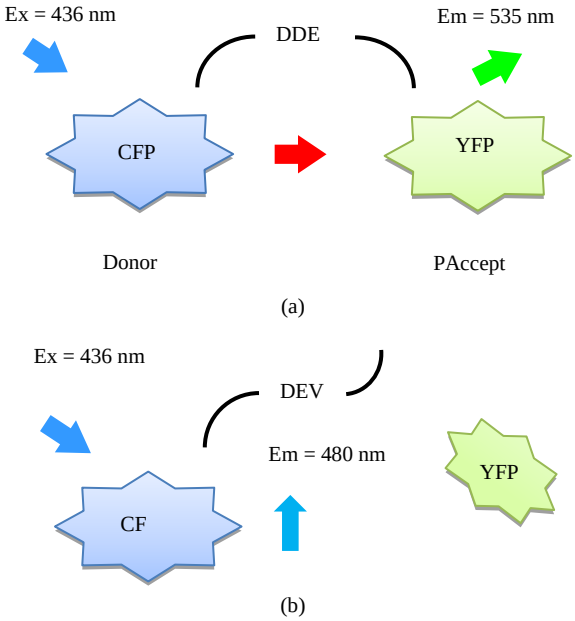


**Fig. S1** Principle of a living cell biosensor in detecting caspase-3 activation based on FRET effect. (a) Living HUVEC-C3 with a 535-nm green fluorescent emission, and (b) dead HUVEC-C3 with cleaved linker peptide and a 480-nm blue fluorescent emission.

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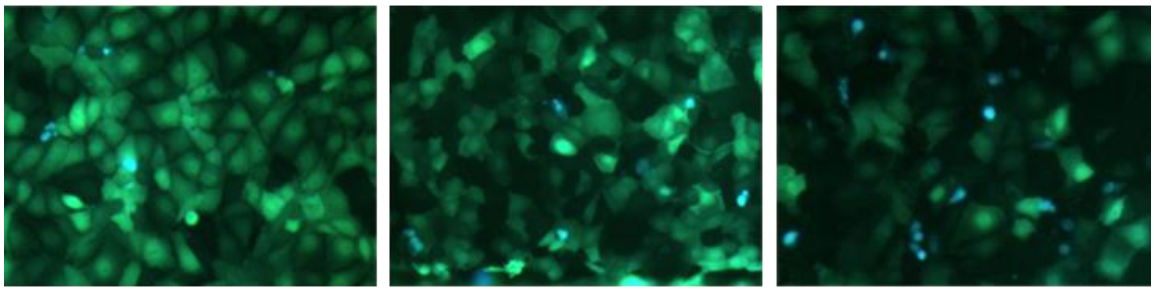
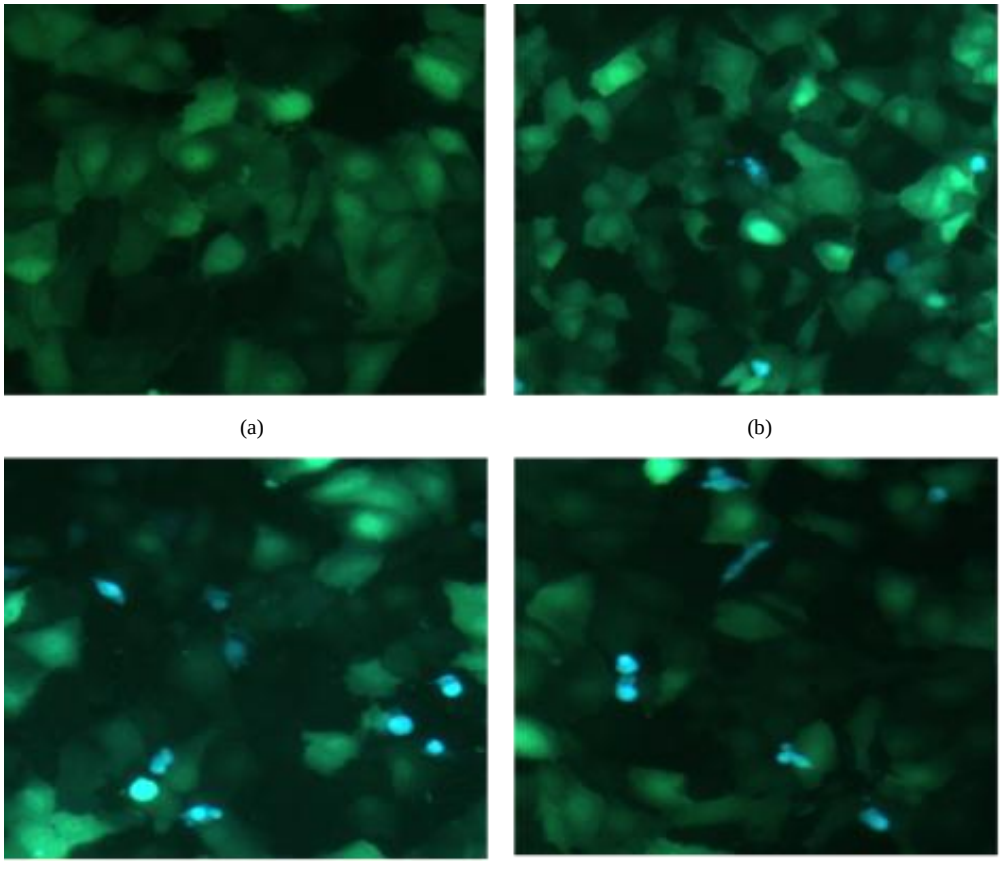


(a) (b) (c)

**Fig. S2** FRET changes in response to caspase-3 activation with different glucose concentrations (a) 5 mM (b) 10 mM (c) 20 mM under shear stress 30 dyne $cm^{-2}$ 2 h plus shear stress 15 dyne $cm^{-2}$ 10 h.



(a) (b)

(c) (d)

**Fig. S3** FRET changes in response to caspase-3 activation under different conditions (a) 5 mM glucose under shear stress of 15 dyne $cm^{-2}$ for 12 h, (b) 20 mM glucose under shear stress of 15 dyne $cm^{-2}$ for 12 h (c) 20 mM glucose under shear stress of 30 dyne $cm^{-2}$ for 1 h plus shear stress of 15 dyne $cm^{-2}$ for 11 h, (d) 20 mM glucose under shear stress of 30 dyne $cm^{-2}$ for 2 h plus shear stress of 15 dyne $cm^{-2}$ for 12 h.

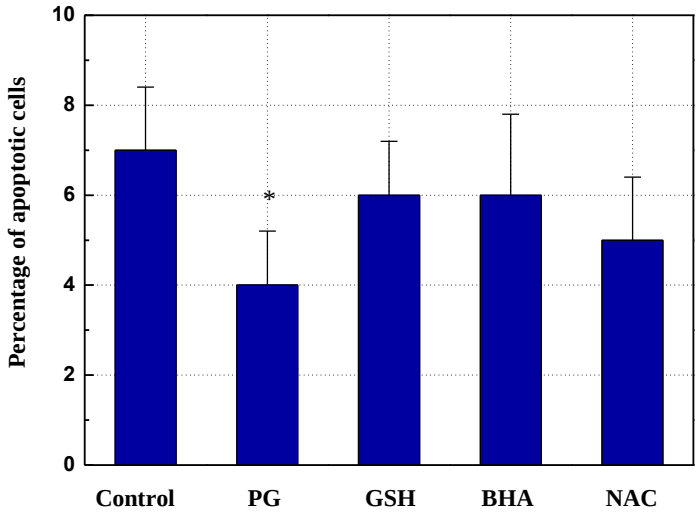



**Fig. S4** Effect of antioxidant drugs on high glucose and shear stress induced cell apoptosis.