**Noise-free bioelectronics using unconventional Bandpass filter inspired by Spider’s cuticular pad**

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Biophysiology detection from current advanced electronics is limited by external signal artifacts (e.g. walking and respiration). Here, we present the viscoelastic gelatin/chitosan hydrogel damper inspired by the viscoelastic cuticular pad in a spider to remove dynamic mechanical noise artifacts selectively under 30 Hz.[1] The hydrogel exhibits frequency-dependent phase transition that results in a rubbery state that damps low-frequency noise and a glassy state that transmits the desired high-frequency signals. Instead of the conventional signal processing, the hydrogel damper served as unconventional pass filter that is able to be integrated with advanced bioelectronics and nanoscale crack based sensor [2] for biophysiology detection even in noisy conditions. It can dissolve chronic noise problems in the bioelectronics, and shows huge potential for uninterrupted monitoring of devices (i.e., gadgets, medical devices, or prostheses) for patients.

[1] B. Park et al, Science in press

[2] D. Kang et al, Nature 516, 222 (2014)