Supporting Information

Multifunctional Wearable Sensor based on Graphene/Inverse Opal Cellulose Film for Simultaneous, in situ Monitoring of Human Motion and Sweat

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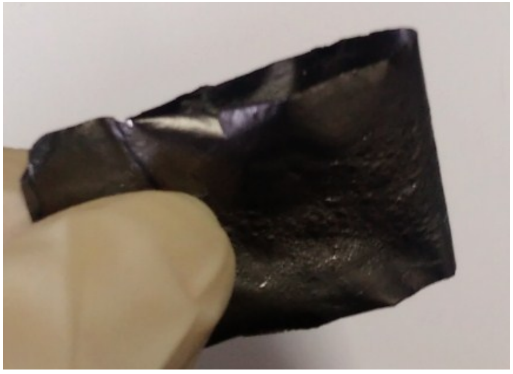


Fig. S1 Photograph of a free-standing rGO film.

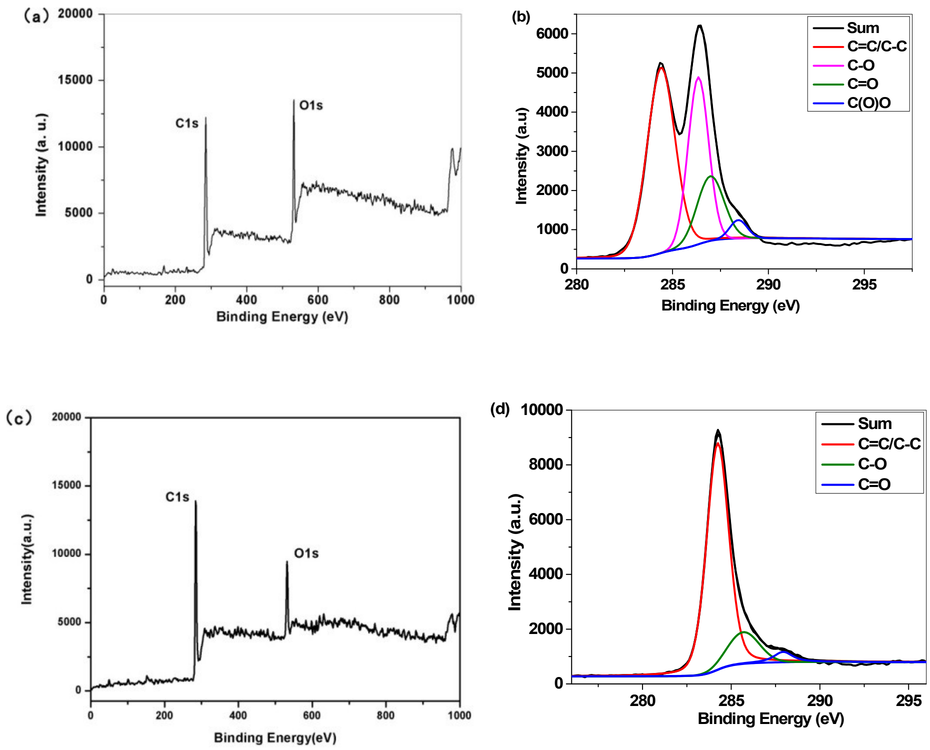


Fig. S2 XPS spectra of GO film (a) and rGO film (c). C1s region of GO film (b) and rGO film (d).

Fig. S3 (a) SiO_2 collodial crystal template; (b) inverse opal AC film; (c) rGO film fixed on the AC film without microstructure as flexible strain sensor (rGO/AC).

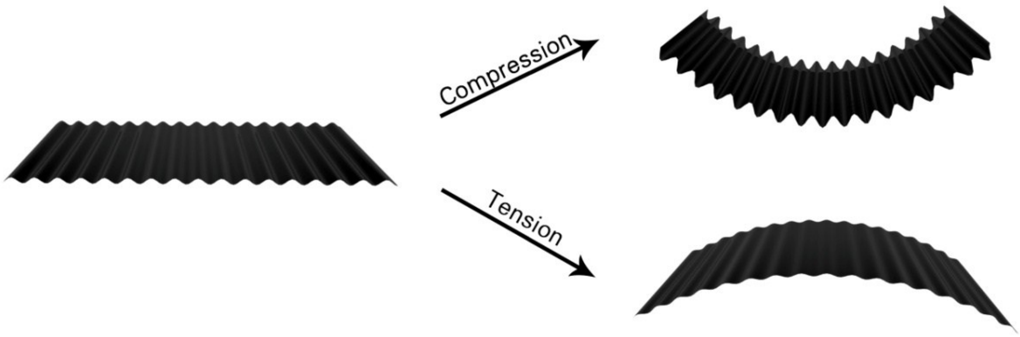


Fig. S4 Schematic illustration of the sensing mechanism.

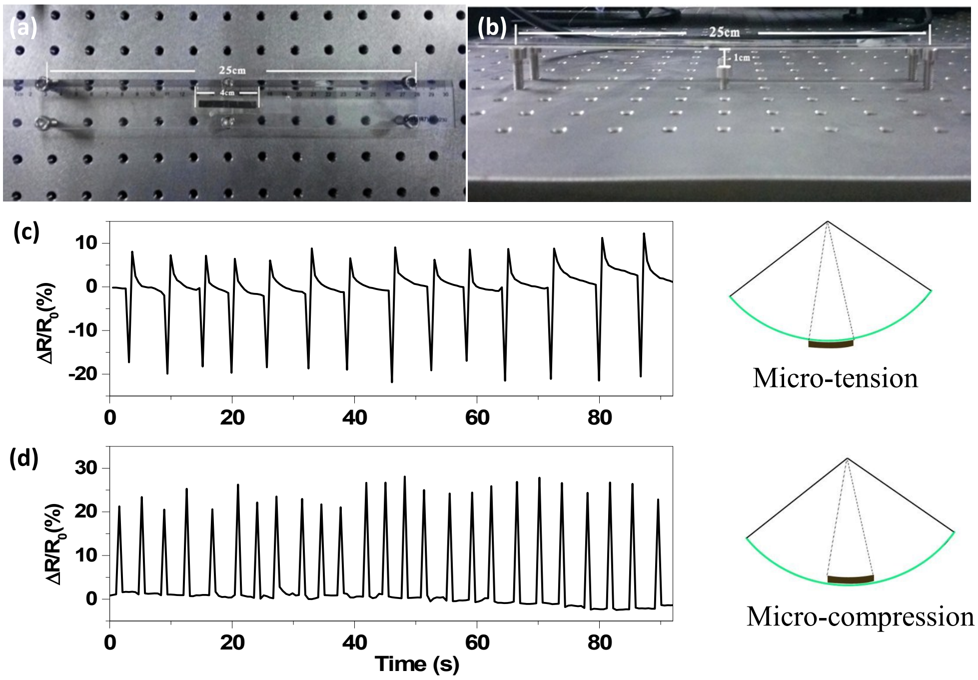
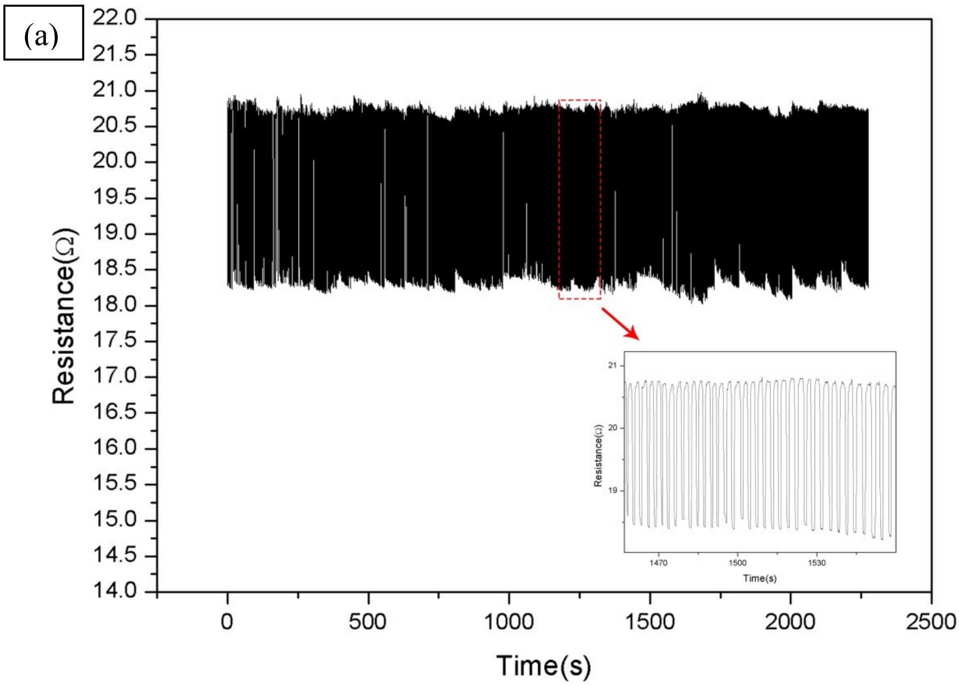


Fig. S5 (a-b) photographs of rGO/IOAC sensor fixed to a flexible surface to detect microstrain structural variation. (d-e) Relative resistance changes of the sensor under the tensile (up) and compressive (down) strain. Right pictures are the monitoring models of the tensile (up) and compressive (down) strain.



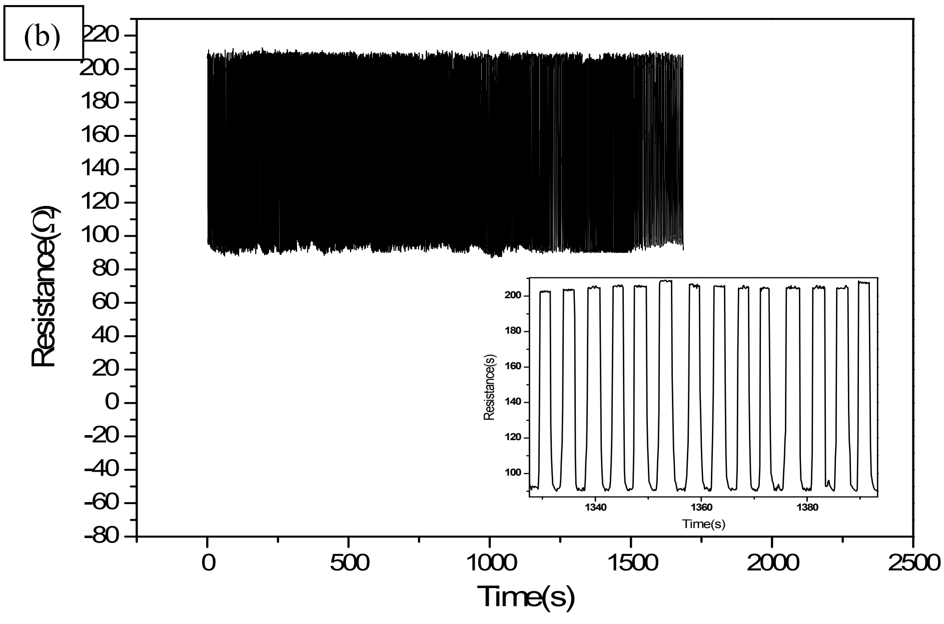


Fig. S6 The resistance values of the rGO/IOAC sensor measured under the multiple bending and relaxed state. (a) 0.17% strain; (b) 0.43% strain; The inset is the magnification

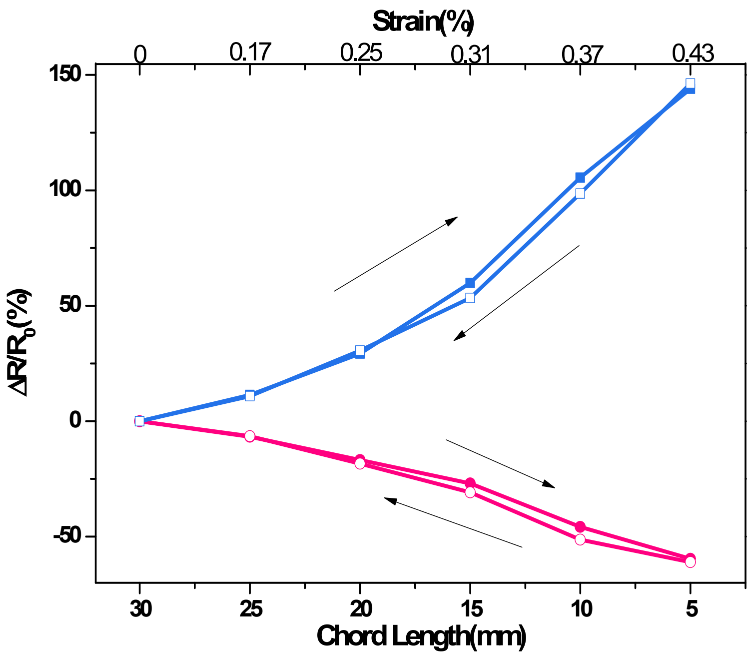


Fig. S7 Resistance change of the rGO/IOAC sensor during strain increase and decrease.

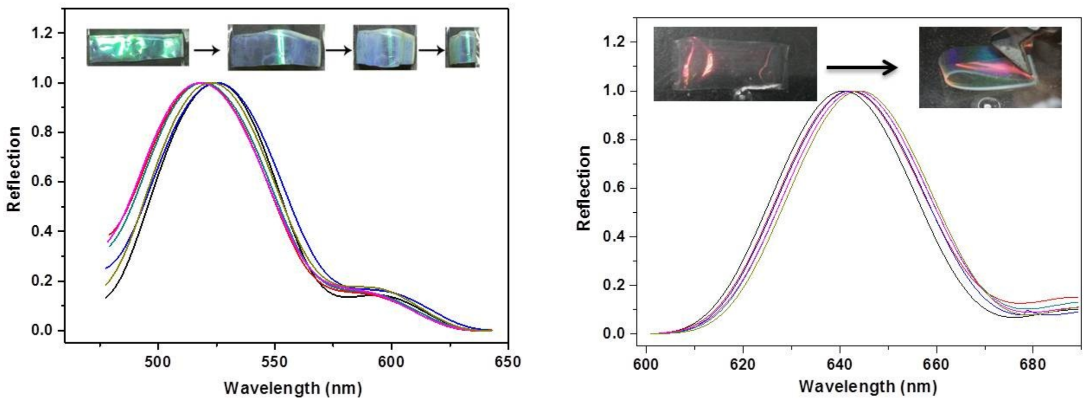


Fig. S8 The structure color and diffraction-peak of the IOAC substrate (left) and the IOAC substrate in artificial sweat (right) under different bending-stretching conditions

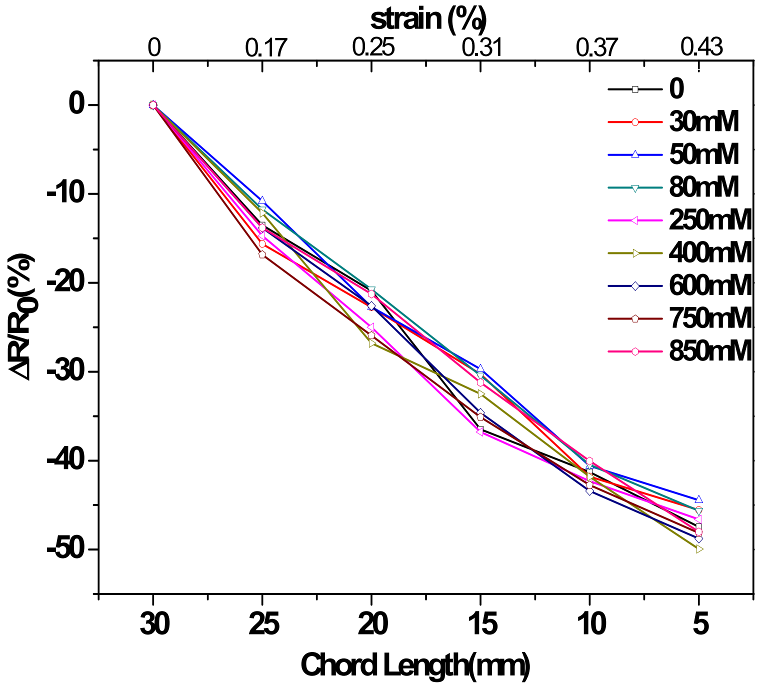


Fig. S9 The bending strain response of the rGO/IOAC sensor while the IOAC substrate absorbed different concentration of NaCl.

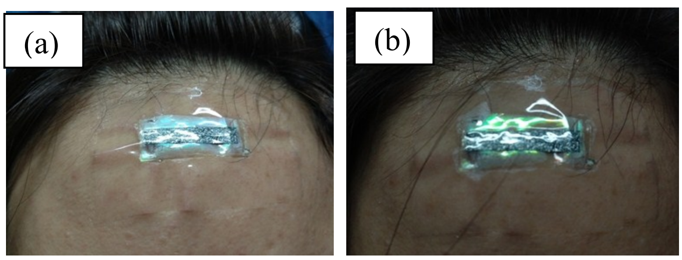


Fig. S10 Photographs of the rGO/IOAC sensor attached on the forehead to monitor sweat during runing. (a) the initial sensor; (b) the sensor absorbed sweat after runing for about 15 min .