Electronic Supplementary Material (ESI) for Journal of Materials Chemistry B.

A low-power and flexible bioinspired artificial sensory neuron capable of tactile perceptual and associative learning

*Qing Xia, Yuxiang Qin *, Anbo Zheng, Peilun Qiu,*

Q. Xia, Prof. Y.X. Qin, A.B. Zheng, P.L. Qiu,
School of Microelectronics, Tianjin University, Tianjin 300072, China
Prof. Y.X. Qin
Tianjin Key Laboratory of Imaging and Sensing Microelectronic Technology, Tianjin University, Tianjin 300072, China
Prof. Y.X. Qin
Key Laboratory for Advanced Ceramics and Machining Technology, Ministry of Education, School of Materials Science and Engineering, Tianjin University, Tianjin 300072, China
E-mail: qinyuxiang@tju.edu.cn

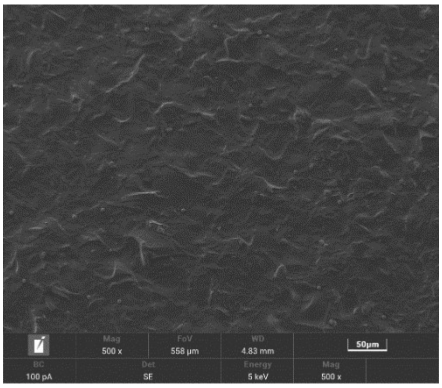

Figure S1. SEM image of the PAM/CS-Fe^{3+} DN hydrogel.

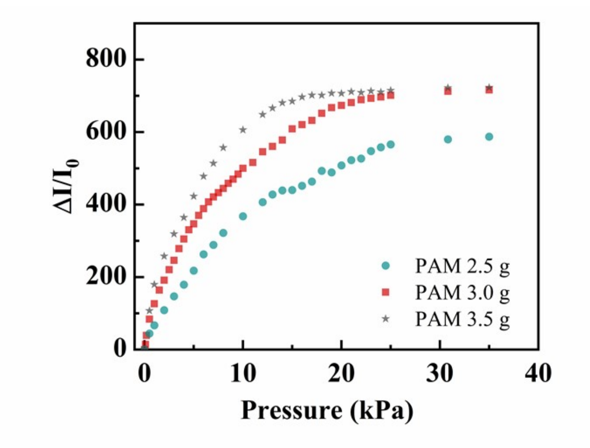

Figure S2. Relative current change of the E-skins with different concentrations of polyacrylamide.

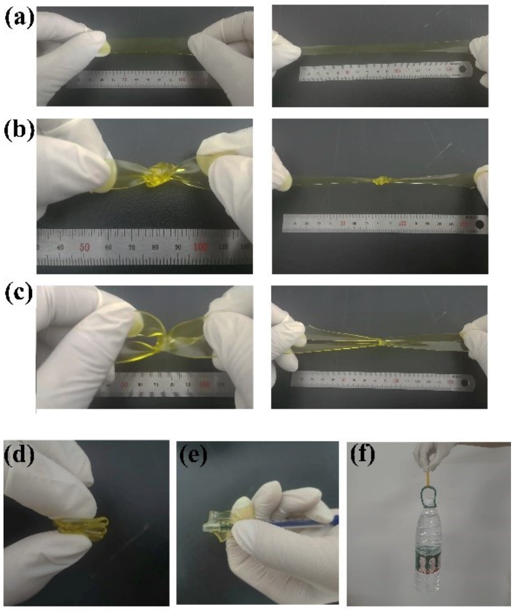

Figure S3. Mechanical properties demonstration of the DN hydrogel: (a) stretching; (b) knotted stretching; and (c) cross-stretching. (d) curling. (f) puncture resistance; (g) weight loading.

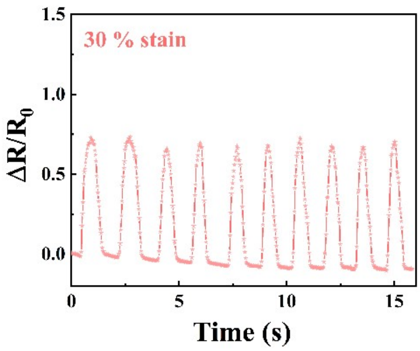

Figure S4. Cyclically relative resistance changes during 10 successive cycles.

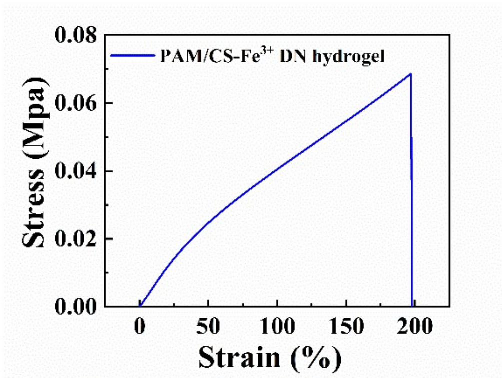

Figure S5. The tensile stress-strain curve of the polyacrylamide (PAM)/chitosan (CS)-Fe^{3+} dual network hydrogel.

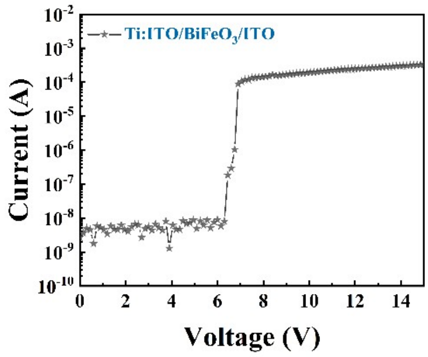

Figure S6. Semilog image of electroforming process of Ti:ITO/BiFeO$_3$/ITO device.

Figure S7. The physical picture of the artificial tactile neuron devices on the finger (E-skin) and hand (memristor) under different gestures.

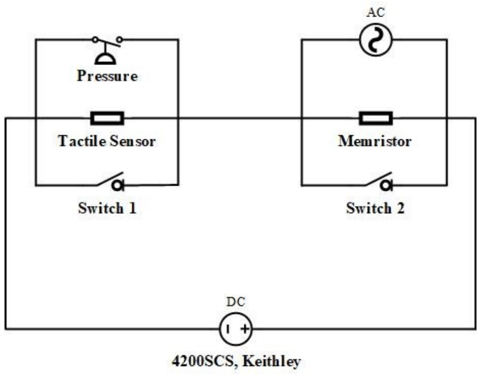

Figure S8. The circuit schematic of the integrated system.

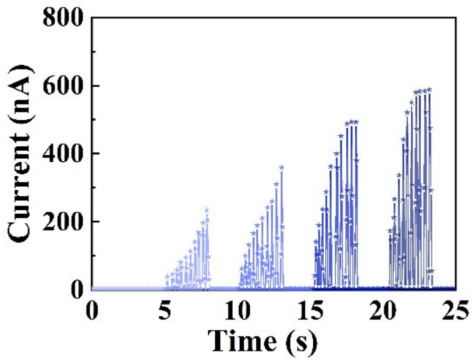

Figure S9. Current response of artificial tactile perceptual neurons under different tactile stimuli (0-5 kPa).

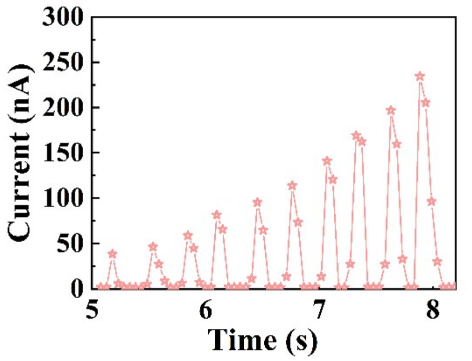

Figure S10. Current response of artificial tactile perceptual neuron at different counts (1-10 times) of consecutive pressing at 500 Pa.