

## Supporting Information

### **Natively stretchable micro-supercapacitors based on PEDOT:PSS hydrogel**

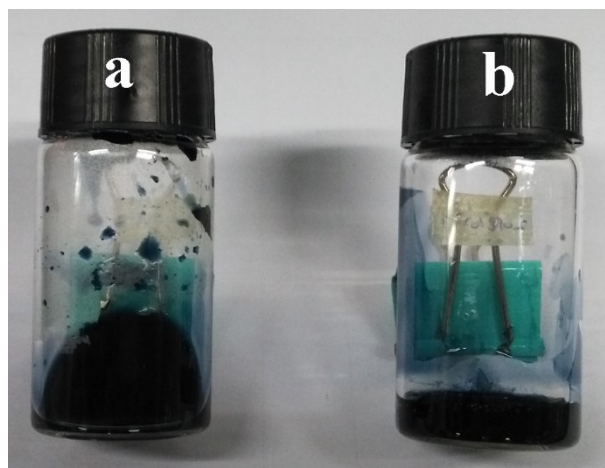
Jinhui Li<sup>a</sup>, Wenrong Yan<sup>a</sup>, Guoping Zhang<sup>b</sup>, Rong Sun<sup>\*b</sup> and Derek HO<sup>\*a</sup>

<sup>a</sup> Department of Materials Science and Engineering, City University of Hong Kong, 83 Tat Chee Avenue, Kowloon, Hong Kong 999077, China.

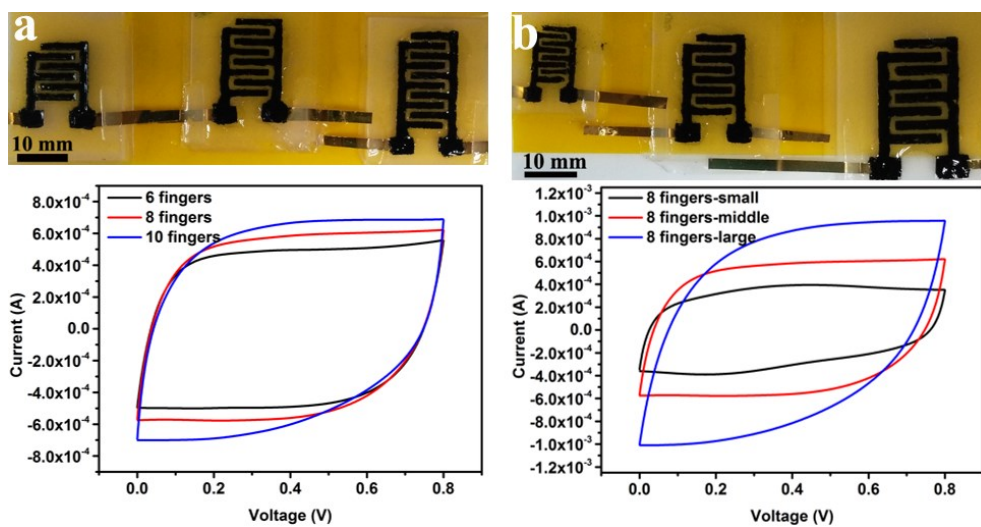
<sup>b</sup> The Shenzhen International Innovation Institutes of Advanced Electronic Materials, Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences, Shenzhen 518055, China.

Corresponding authors:

E-mail address: derekho@cityu.edu.hk (D. Ho), and rong.sun@siat.ac.cn (R. Sun).



**Fig. S1.** Images of (a) the PEDOT:PSS solutions heated at 90 °C for 3h and (b) the PEDOT:PSS-LiTFSI hydrogels heated after 90 °C for 3h.



**Fig. S2.** The customized MSCs with different fingers and sizes and their corresponding CV curves.



**Fig. S3.** The customized patterns of “City U” with different sizes.

**Table S1.** Comparison of recently reported stretchable MSCs

Material	Method	Structure	Electrolyte	Capacitance	Energy density	Power density	Cycling	Stretchability	Ref.
MWCNT/ PANI	3D printing/ sputter/injection	Concave wavy	PMMA /LiClO <sub>4</sub>	44.13 mF cm <sup>-2</sup>	0.004 mWh cm <sup>-2</sup>	0.07 mW cm <sup>-2</sup>	87% remained after 20 000 cycles	88% remained at 40% strain	[1]
Graphene /NiO/Co <sub>3</sub> O <sub>4</sub>	Laser/coating	3D porous	PVA/H <sub>3</sub> PO <sub>4</sub>	2.4 mF cm <sup>-2</sup>	Not shown	Not shown	98.4% after 10 000 cycles	77.1% at 50% strain	[2]
MnO <sub>2</sub> /C NTs	photolithography	fractal pattern	ionic [BMIM][ TFSI]/P MMA	12.6 mF cm <sup>-2</sup> at 5 mA cm <sup>-2</sup>	1.12 μWh cm <sup>-2</sup>	3.99 μW cm <sup>-2</sup>	75% after 10000 cycles	96% at 30% strain	[3]
Graphene /PEDOT: PSS	Laser/coating	3D porous	PAAK/K OH	720 μF cm <sup>-2</sup> at 75 μA cm <sup>-2</sup>	Not shown	Not shown	96% remained after 10 000 cycles	38.9% remained at 200% strain	[4]
SWCNT	CVD/ laser/ pre-stretch	buckled structure	PVA/H <sub>3</sub> PO <sub>4</sub>	15.1 μF cm <sup>-2</sup>	Not shown	Not shown	1000 cycles	Max: 200%	[5]
Reduced graphene oxide microribbons	Photolithography/prestretch etch	Suspended wavy belts	PVA/H <sub>3</sub> PO <sub>4</sub>	0.54 mF cm <sup>-2</sup> at 500 mV s <sup>-1</sup>	0.52 mWh cm <sup>-2</sup>	417 mW cm <sup>-2</sup>	5000 cycles	Max: 100% Remainin g: Not shown	[6]
<b>PEDOT hydrogel</b>	<b>Laser/injection</b>	<b>Flat gel film</b>	<b>PVA/H<sub>2</sub> SO<sub>4</sub></b>	<b>41.38- 47.59 mF cm<sup>-2</sup></b>	<b>0.0036- 0.0042 mWh cm<sup>-2</sup></b>	<b>0.04- 0.4 mW cm<sup>-2</sup></b>	<b>&gt;98% after 10000 cycles</b>	<b>93% remained at 200% strain</b>	<b>This work</b>

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