

Electronic Supplementary Information (ESI)

Directly Swallowable and Ingestible Micro-supercapacitor

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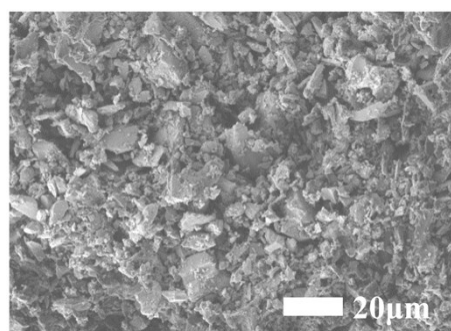


Fig. S1. The magnitude image of the AC electrode on gelatin sheet substrate.

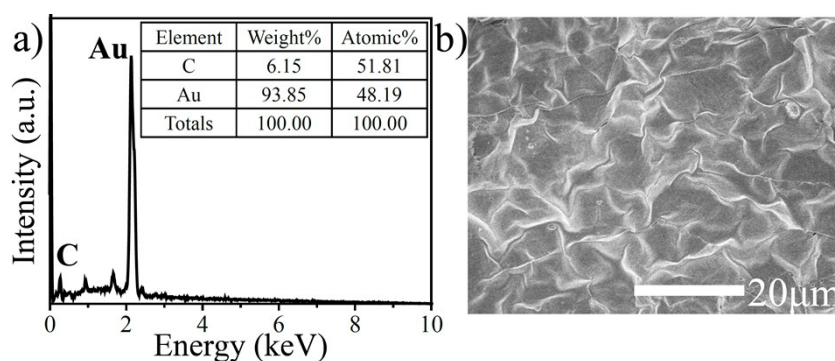


Fig. S2. a) Energy disperse spectrometer (EDS) spectrum of gold leaf. b) The magnitude SEM image of the gold current collector.

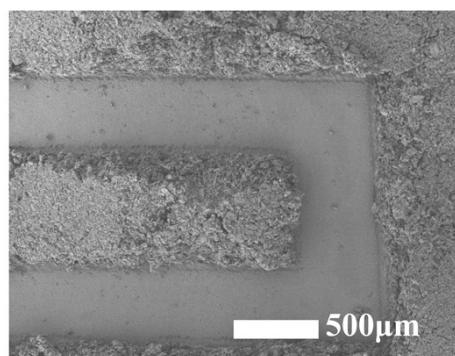


Fig. S3. The SEM image of the gelatin sheet substrate with activated charcoal as the electrode.

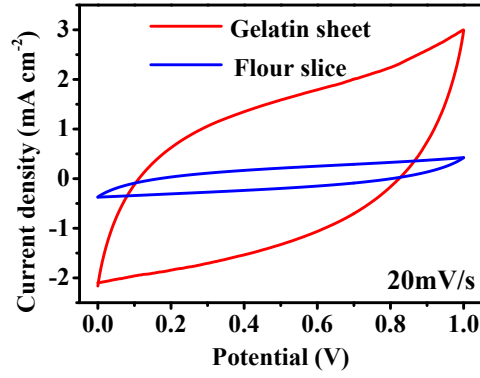


Fig. S4. The comparison of CV curves under the scan rates of 20 mV/s of the EMSC made of gelatin and flour slice substrate, respectively.

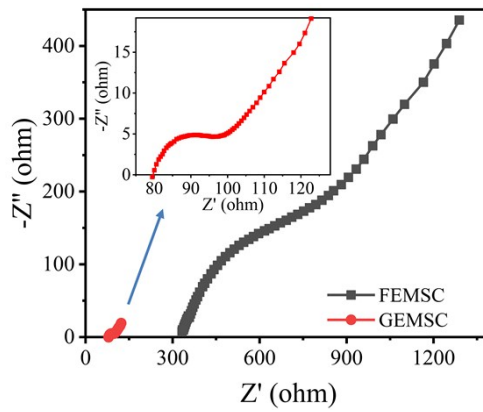


Fig. S5. The Nyquist plot of the FEMSC and GEMSC; Inset: the magnified Nyquist plot of the GEMSC.

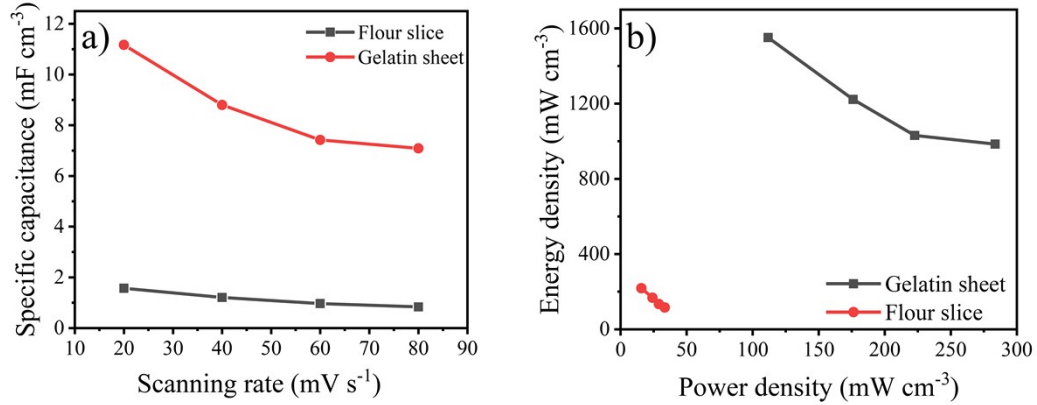


Fig. S6. a) Volumetric capacitance of the EMSC made of gelatin sheet substrate and flour slice substrate, respectively, as a function of the scan rate for the CV characterization. b) The Ragone plot of the made of gelatin substrate and flour slice substrate, respectively, for comparison.

Table S1 Comparison of the electrochemical performance of biocompatible supercapacitors

References	Electrode materials	Energy density ($\mu\text{Wh cm}^{-2}$)	Power density (mW cm^{-2})	Areal capacitance (mF cm^{-2})
1	Sputtering or e-beam evaporation of W, Fe, Mo layer	0.0083	1	1.6
2	PEDOT:PSS/rGO ink	16.8	10.4	9.85
3	Cellulose/ionic liquid membrane	5.324	0.1916	153.34
4	Anodized molybdenum oxide film	0.37	0.8	4.15
5	(PEDOT:PSS)/ferritin nanoclusters/MWCNT sheets	0.82	0.15	32.9
6	TiO ₂ nanotube array	180	136	1.42
7	Thermally exfoliated graphene	-	-	0.00497
8	MoS ₂ /GO nanosheet	52700	200	380
Our work	AC slurry	10.86	0.78	78.2

**Fig. S7.** Optical image of an LED lighted by two EMSC with gelatin sheet substrate connected in series under a current density of 0.1 mA cm^{-2} .**Fig. S8.** A picture of nine GEMSCs coiled into one capsule.

References

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