Supporting Information

Self-Healing, Adhesive Liquid Metal Hydrogels Based on PNIPAM

Microgels for High-Performance Temperature and Strain Sensors.

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Figure S1. (a-b) SEM images of PNIPAM microgels.



Figure S2. (a) SEM images of the ML hydrogel and (b-f) mapping of the corresponding elements.



Figure S3. The toughness for different liquid metal contents of the ML hydrogels.



Figure S4. Presentation of images of ML conductive hydrogel before and after

subjecting it to compression with 500 g weights.



Figure S5. Compressive stress-strain curves of hydrogels with and without liquid

metal.



Figure S6. Variation of G' and G" with strain from 1 to 100% ($\omega = 1.0$ Hz) for the original and healed hydrogel.



Figure S7. Residual mass rate of ML hydrogels after 7 days of degradation in PBS solution.



Figure S8. Contact angle test of ML hydrogel (contact angle of 38.384°).



Figure S9. Degradation rate of ML hydrogels after 7 days of degradation in PBS solution.



Figure S10. Electrical conductivity of the ML hydrogels with different liquid metal



Figure S11. Comparison of the brightness of light-emitting diodes containing liquid metal hydrogels and those without liquid metal hydrogels.

contents.



Figure S12. Adhesion characteristics of hydrogels, (a) adhesion curves of ML hydrogels on silica substrates with different PNIPAM microgel contents and (b) adhesion strength.



Figure S13. The ML hydrogel temperature sensors provide repeatable temperature discrimination in repeated proximity to cold (30°C) and hot (70°C) sources.



Figure S14. Image of ML hydrogel attached to the arm.



Figure S15. Cellular activity of ML hydrogels in culture with different extract



concentrations.

Figure S16. Cell viability of ML hydrogels after 12h and 24h incubation.

Sensors	Strain (%)	GF value	Reference
CMC/PAAm/LM	300	0.7	[1]
LBPB	2850	4.12	[2]
LM/PAA	1300	1.5	[3]
PVA-TA-EGaIn	350	2.59	[4]
CHACC-LM	223	0.6	[5]
LM/PVA	375	0.86	[6]
Gel-Mic-PAAm-	1224	1.14	[7]
MXene			
MR/LM-PAAm-	1040	5.45	This work
PEI (ML)			

Table S1. Comparison of stress, linear GF value between as-prepared hydrogels and reported hydrogels.

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