

Supporting Information for

Multifunctional metal-biopolymer coordinated double network hydrogel combining of multi-stimuli responsiveness, self-healing, shape memory and antibacterial properties

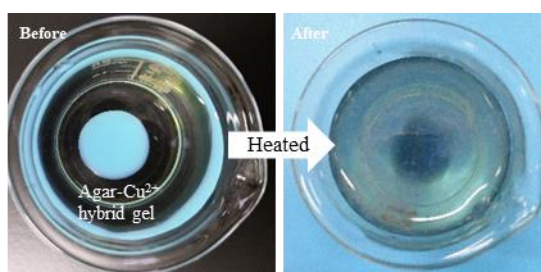


Fig. S1 Optical images illustrate the Agar-Cu²⁺ hybrid gel was completely dissolved after being heated at 85 °C for 5 min in water solution.

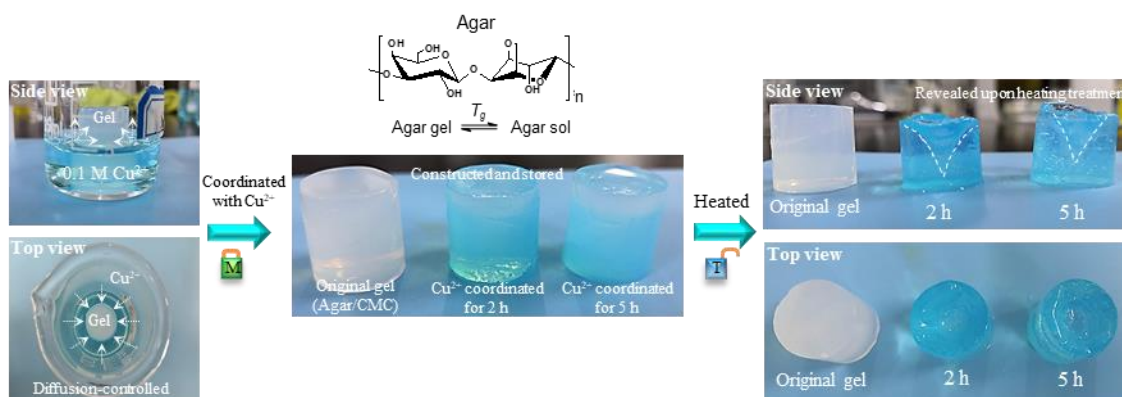


Fig. S2 The Agar/CMC-Cu²⁺ DN gels with different irregular/pre-designed 3D shapes were constructed and stored in a bulk Agar gel matrix by using a diffusion-controlled approach and then revealed by heated at 85 °C for 5 min.

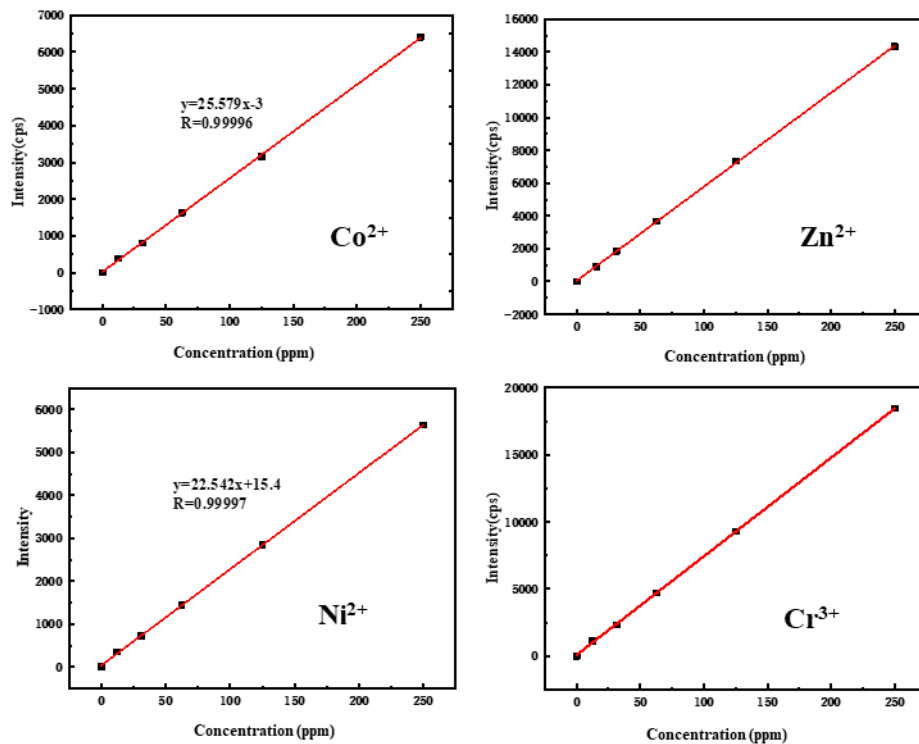


Fig. S3 Calibration curves of different metal ions show the linearly correlations between the intensities and concentrations.

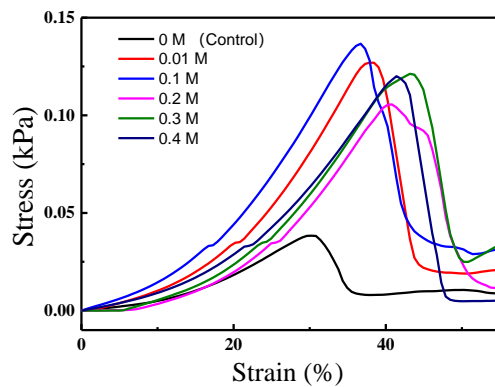


Fig. S4 Mechanical properties of the CMC/Agar hydrogels immersed in a solution containing of varied concentrations of Cu²⁺ for 12 hours.

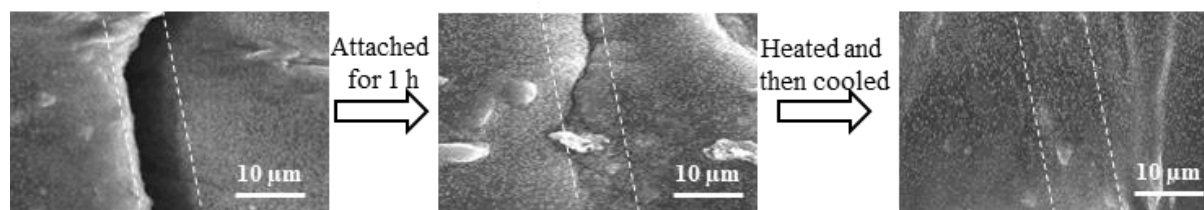


Fig. S5 Topography observations of the copper ions coordinated hybrid DN gels at different stage revealing the multi-staged self-healing behavior after reprogrammed the agar gel medium at 85 °C for 5 min.