# Supporting Information

## *In situ* formation of nanocomposite double-network hydrogels with shear-thinning and self-healing properties

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**Keywords**: nanocomposite double-network hydrogels, dynamic covalent bonds, shear-thinning, self-healing

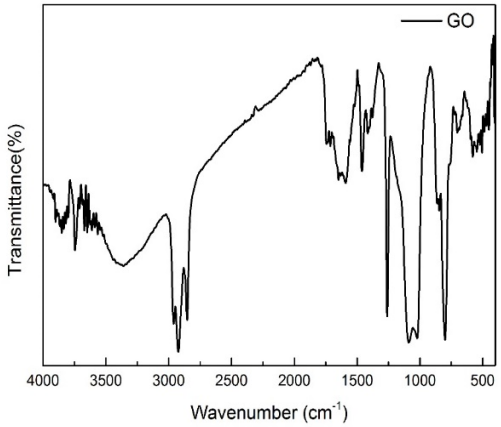


**Figure S1.** FTIR spectrum of GO.

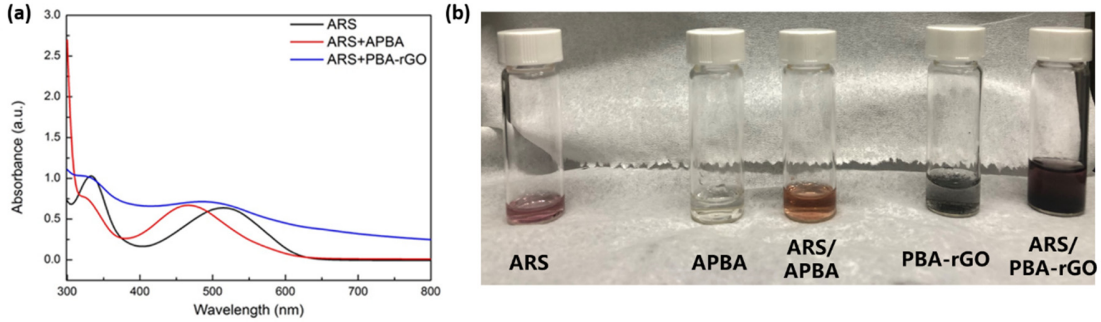


**Figure S2.** (a) UV-Vis spectra and (b) images of ARS, APBA solution, ARS/APBA, PBA-rGO, ARS/PBA-rGO solutions.

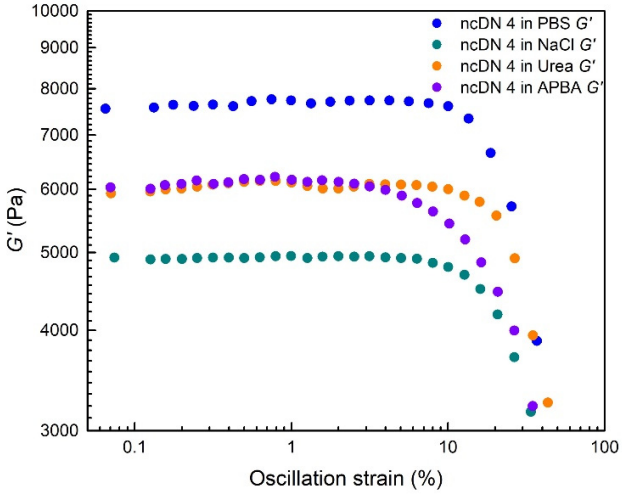


**Figure S3.** Continuous strain sweep (from 0.1% to 100%) of ncDN 4 hydrogels after incubation in PBS solution and PBS solution containing different chemicals (i.e. NaCl (400 mM), urea (400 mM), and APBA (40 mM)) for one day.

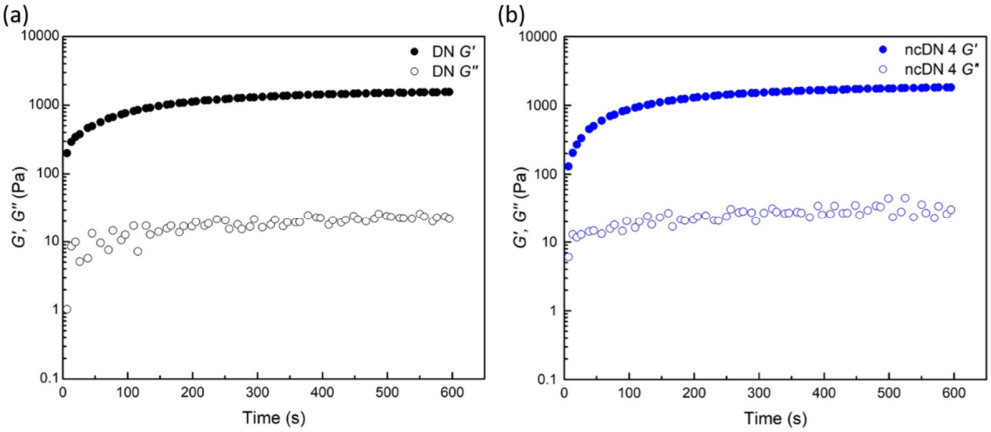


**Figure S4.** Time sweep test of DN and ncDN 4 hydrogel formation.

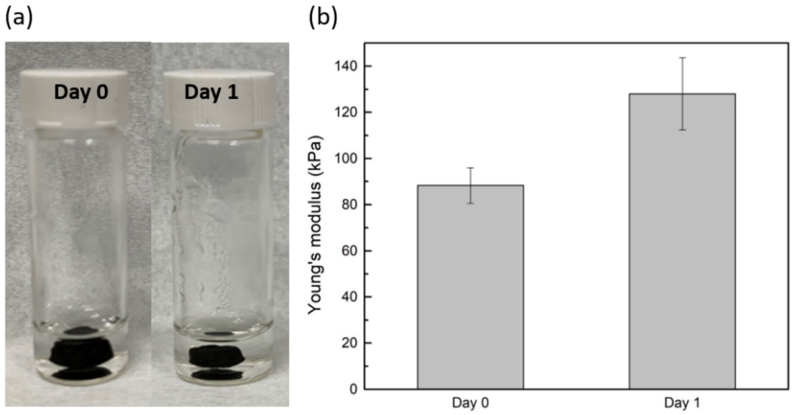


**Figure S5.** (a) Images and (b) Young's modulus of ncDN 4 hydrogels immersed in PBS solution at 37 ºC at day 0 and day 1.

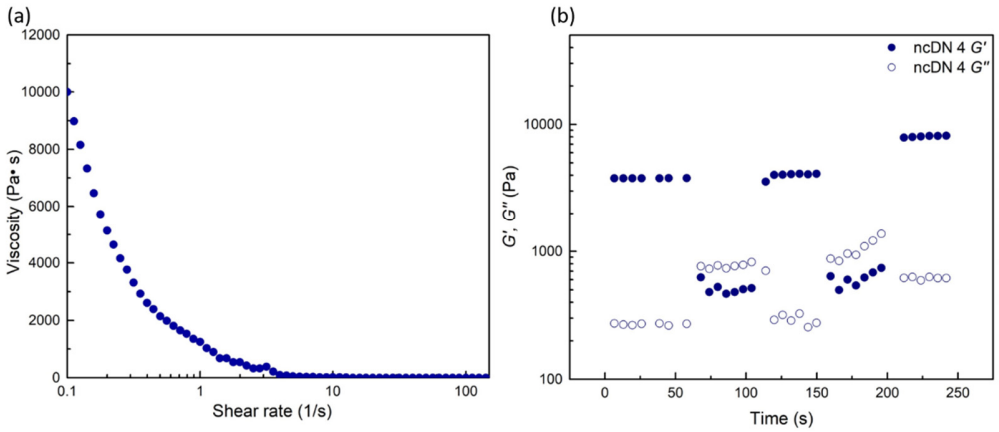


**Figure S6.** (a) Viscosity test of ncDN 4 hydrogel (shear rate from 0.1 $s^{-1}$ to 150 $s^{-1}$) and (b) Continuous step strain sweep test of ncDN 4 hydrogel (0.1% and 1000% of strain) at equilibrium swelling condition.

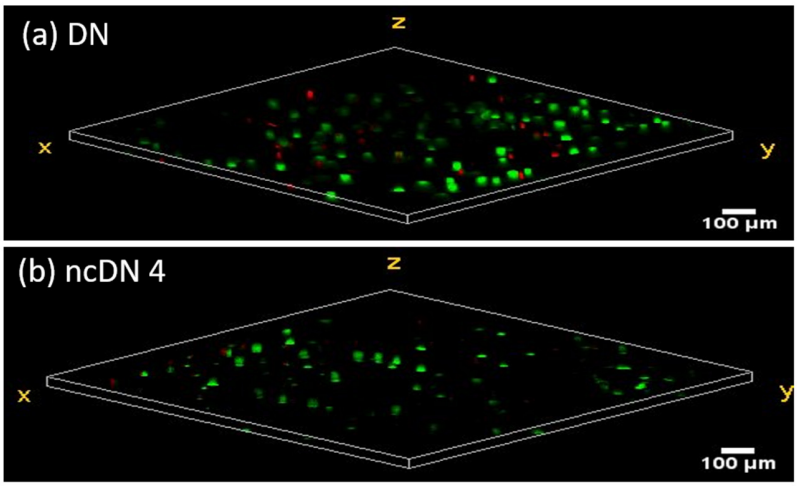


**Figure S7.** Confocal images of live/dead assay of MEFs encapsulation in (a) DN and (b) ncDN 4 hydrogels. The green signals indicated the live cells and the red one indicated the dead cells.

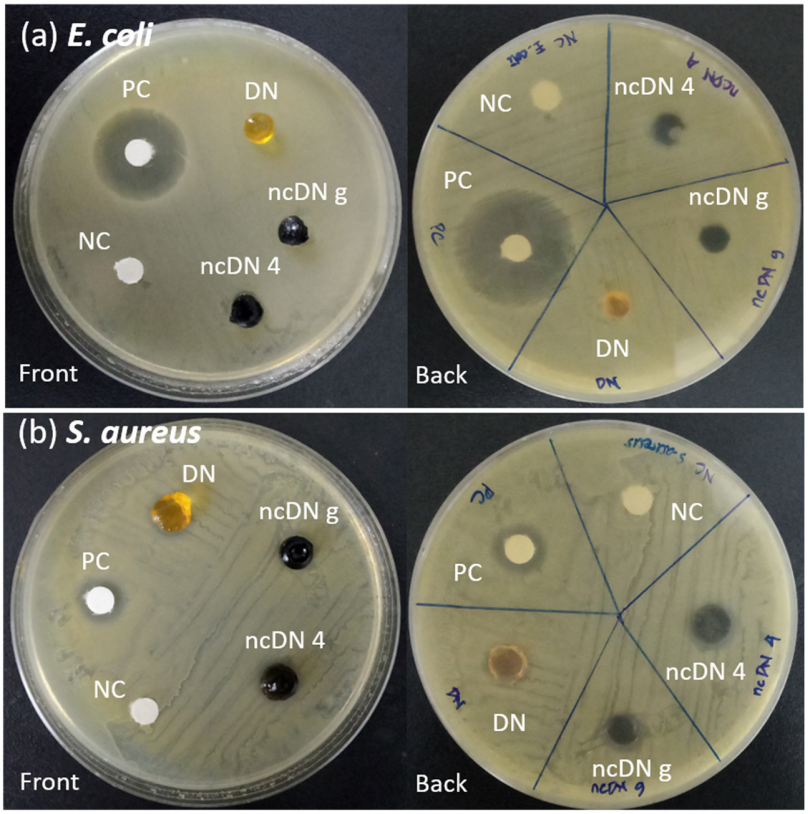


**Figure S8.** Photographic images of the antibacterial activities of the DN, ncDN g and ncDN 4 hydrogels against (a) *E. coli* and (b) *S. aureus*. For *E. coli*, the inhibition zone of negative control (NC), positive control (PC), DN, ncDN g, and ncDN 4 hydrogels were 0, 22, 6, 9, and 9 mm, respectively. For *S. aureus*, the inhibition zone of NC, PC, DN, ncDN g, and ncDN 4 hydrogels were 0, 9, 10, 9, and 10 mm, respectively.