Electronic Supplementary Material (ESI) for Soft Matter.

Supporting Information for:

Synthesis of polyacid nanogels: pH-responsive sub-100 nm particles for functionalisation and fluorescent hydrogel assembly

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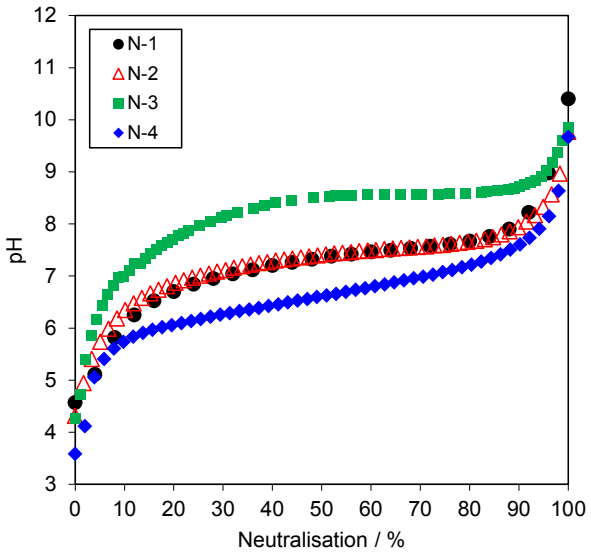

Figure S1. Potentiometric titration data for the non-functionalised nanogel dispersions. The apparent pK_a values were obtained from the pH corresponding to 50% neutralisation.

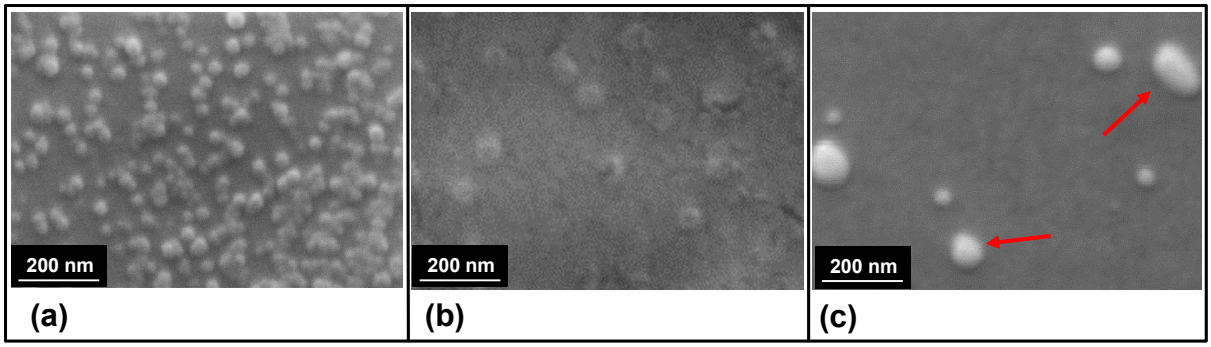

Figure S2. Representative SEM images for (a) N-2, (b) N-3 and (c) N-4. The N-4 particles had a tendency to coalesce during sample drying (due to their low glass transition temperature, T_g) and some examples of this are indicated by the red arrows. (The T_g of poly(ethyl acrylate) is -22 ^oC[1].) Only the isolated nanoparticles were used for calculating the average particle size.

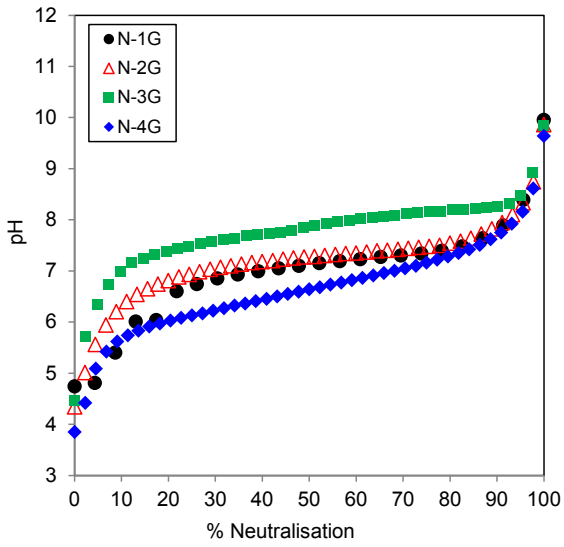

Figure S3. Potentiometric titration data for GMA-functionalised nanogels.

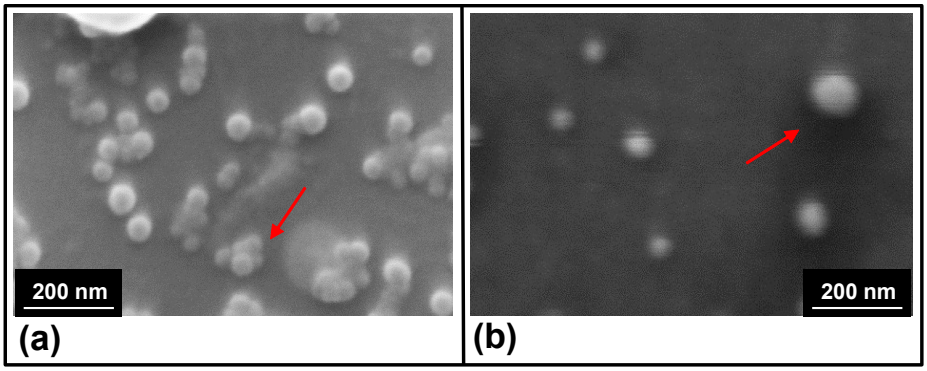

Figure S4. Representative SEM images for (a) N-2G and (b) N-4G. The red arrows highlight (a) aggregates and (b) coalesced nanoparticles that formed during sample drying. The N-2G nanoparticles were based on poly(methyl methacrylate) which has a T_g of 114 ^oC[2]. The latter glassy nanoparticles did not coalesce during SEM sample preparation.

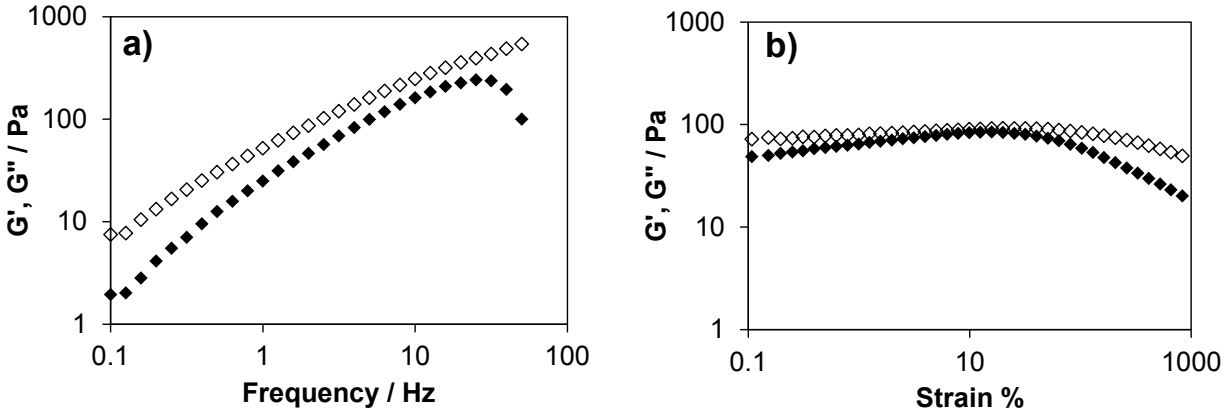

Figure S5. Frequency-sweep (a) and strain-sweep (b) rheology data for N-1G dispersion with a concentration of 12 wt% and pH of 7.4. *G'* (storage modulus) and *G"* (loss modulus) data are shown by the closed and open symbols, respectively.

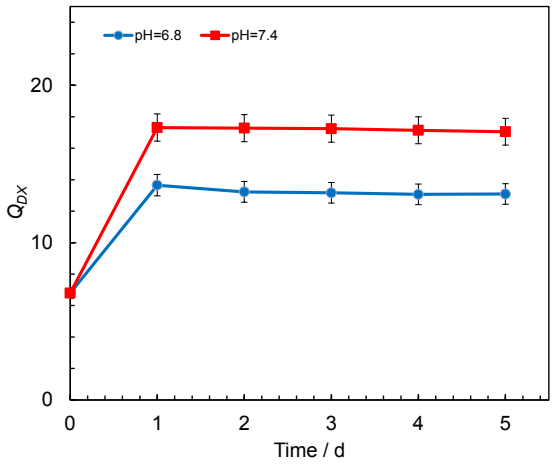

Figure S6. Variation of the volume-swelling ratio for DX N-1G with time. Phosphate buffer solutions were used (0.1 M). There was an initial "breathing in" due to the DX NGs being placed in a large volume of aqueous solution. The DX N-1G gel swelled more at pH 7.4 which was expected from the pH-triggered swelling of the parent N-1G (See Fig. 2b).

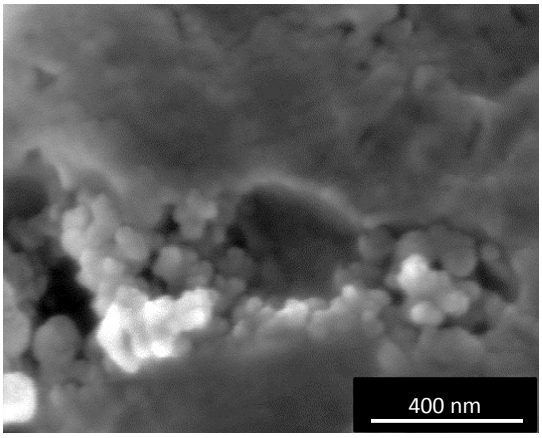

Figure S7. SEM micrograph of freeze dried DX N-1G

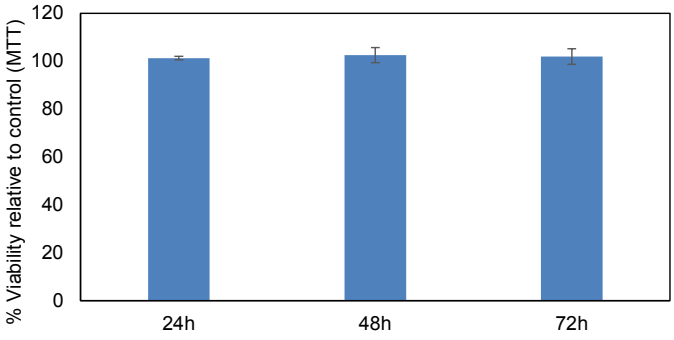

Figure S8. Relative MTT assay data for nucleus pulposus cells exposed to DX N-1G for 24, 48 and 72 hours. The data are shown relative to control samples which were empty inserts.

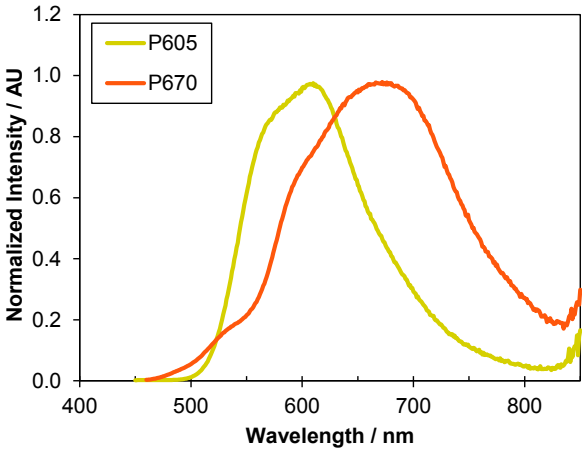

Figure S9. PL spectra for P605 and P670 PDs dispersed in water. The excitation wavelengths used were 380 and 450 nm, respectively. The structures for P605 and P670 are shown in Fig. 3a.

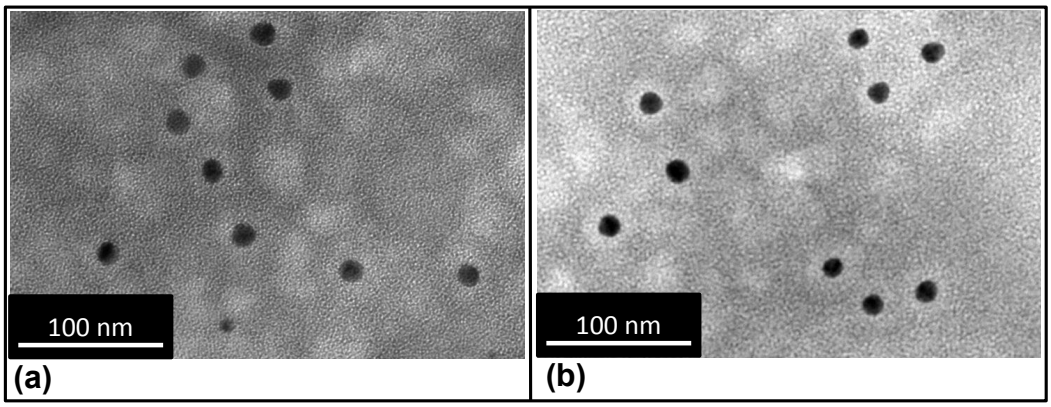

Figure S10. TEM images for (a) P605 and (b) P670 polymer dots.

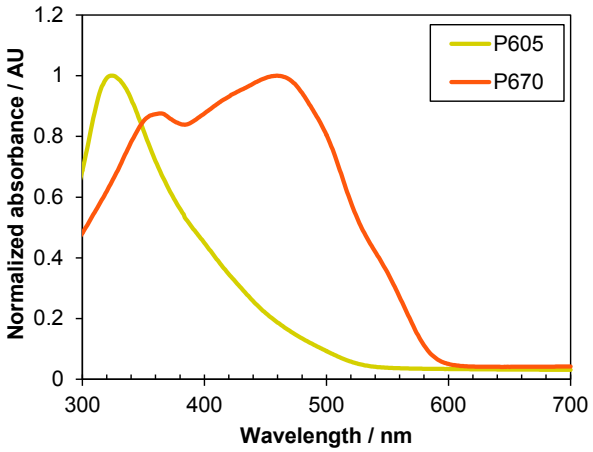

Figure S11. UV-visible spectra for P605 and P670 PD dispersions. The dispersion concentrations were 0.1 wt.%.

References

1. L. H. Sperling, D. W. Taylor, M. L. Kirkpatrick, H. F. George and D. R. Bardman, *J. Appl. Polym. Sci.*, 1970, **14**, 73-78.
2. Y. Grohens, M. Brogly, C. Labbe, M.-O. David and J. Schultz, *Langmuir*, 1998, **14**, 2929-2932.