

Supporting information

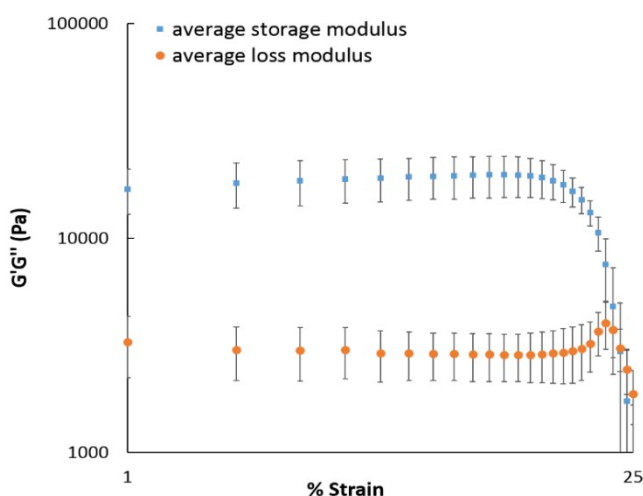


Figure S1 To determine the linear-viscoelastic (LVE) region, storage moduli G' and loss moduli G'' were plotted against the deformation (% strain). The plateau value of G' in the LVE-region describes the rigidity of the sample at rest; the plateau value G'' (1.98×10^4 Pa) is a measure of the viscosity of the unsheared sample at a critical strain value of 11.1%

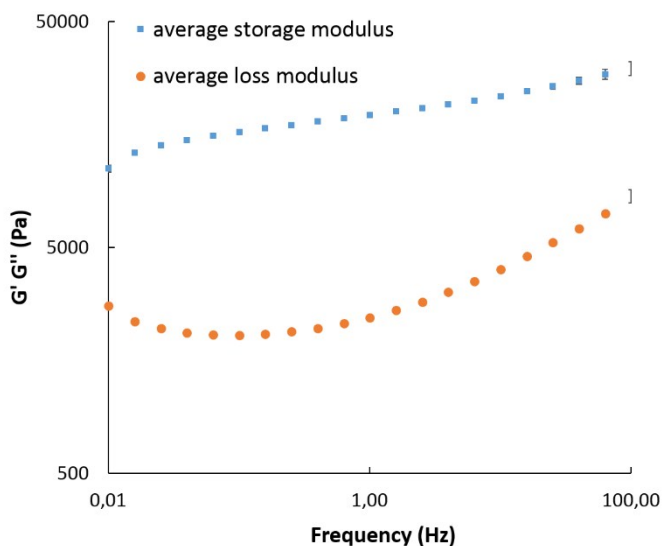


Figure S2 After the linear viscoelastic region has been defined by a strain sweep, the ink's structure can be further characterized using a frequency sweep at a strain below the critical strain ($\gamma_c = 11.1$ %). Below the critical strain, the elastic modulus G' is often nearly independent of frequency, as would be expected from a structured or solid-like material. The more frequency dependent the elastic modulus is, the more fluid-like is the material. At all measured values of frequency range, the value of G'' is always an order higher than G' , which shows inks behaves more like a solid.

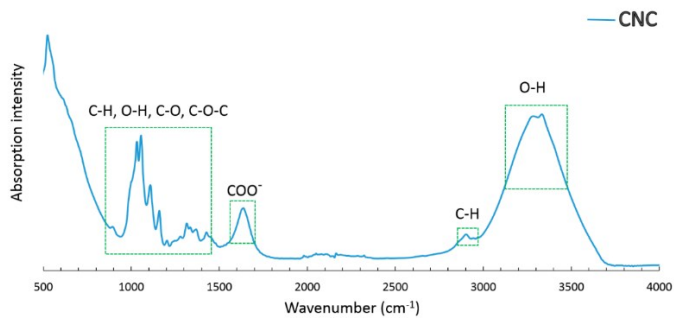


Figure S3 FTIR spectra for CNC.

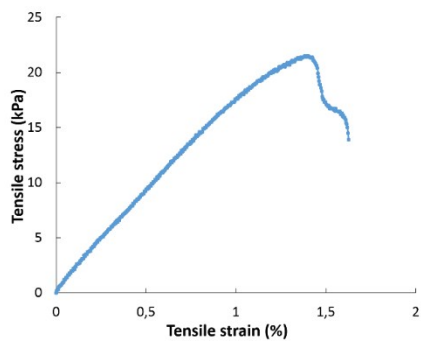


Figure S4 Stress-Strain curve for the 3D printed hydrogel scaffold tested in wet conditions.

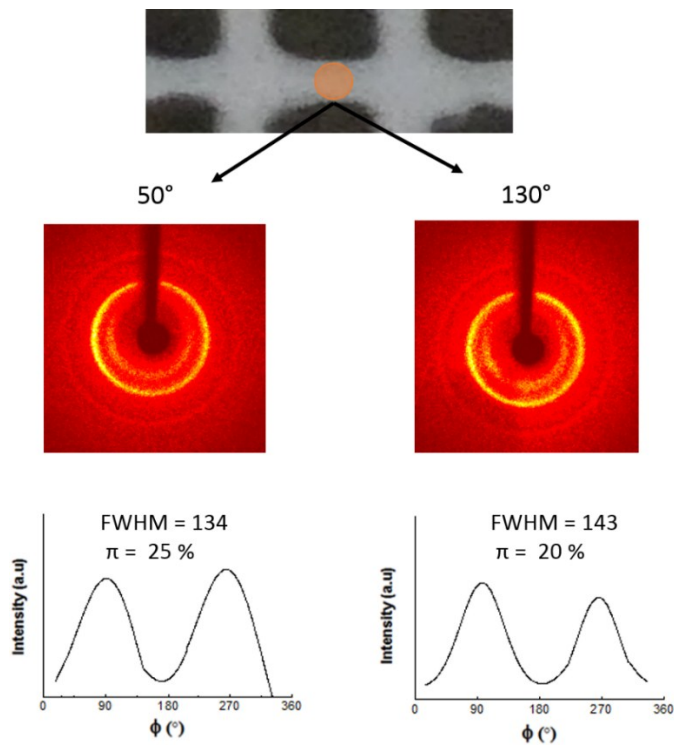


Figure S5 2DWS data representing data measured at the bridge position when phi angle is 50° and 130° for 200 plane.