

Supplementary material – Rheology measurement

The rheological properties (G' and G'') of gelatin were measured by using a TA instruments AR 2000 rheometer. Figure S2 shows G' and G'' as a function of strain (i.e., strain-sweep test). The $\tan\delta$ data appearing in Table 1 (main manuscript and Figure S3) correspond to the average values for the plateau region in the small strain regime (Figure S2(a)), where the filled markers and open markers respectively show G' and G'' values. For all gelatin concentrations, $G' \gg G''$ for strain conditions less than 0.7. In contrast, as the strain increases the values cross-over. This feature is easier to view if we look at the ratio of G' and G'' (i.e., $\tan\delta = G''/G'$) as a function of strain (Figure S2(b)). The $\tan\delta$ reveals that the gelatin behaves as an elastic solid for low strain (<0.7), and, starts to flow more like a fluid for the more substantial strain (>0.8).

The frequency-sweep tests were also performed for different samples (see Figure S4), where the magnitude of all the values measured for low angular frequency are quite similar to that obtained by the strain-sweep tests. Similar to the trend shown in Figure S2, $G' \gg G''$ is found for the small frequency, and G' and G'' values become close to each other when the frequency increases. Figure S4 indicates that the gelatin can flow when the gelatin experiences not only the large deformation but also the fast deformation.

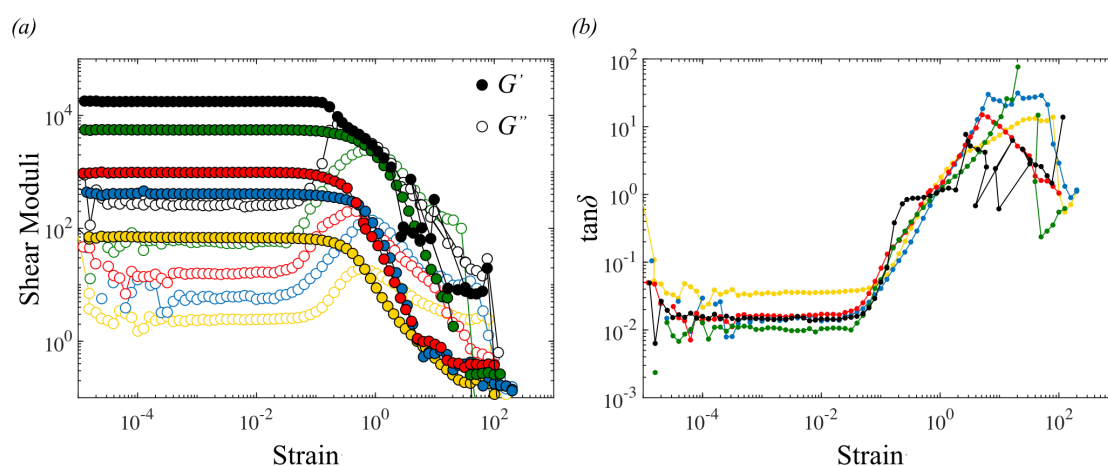


Figure S2. Measured rheology data of gelatin as a function of strain (colors correspond to the concentration C presented in Figure 7 of the main manuscript). The filled and open markers in (a) show G' and G'' values, respectively. The angle $\tan\delta$ in (b) is defined as the ratio G''/G' .

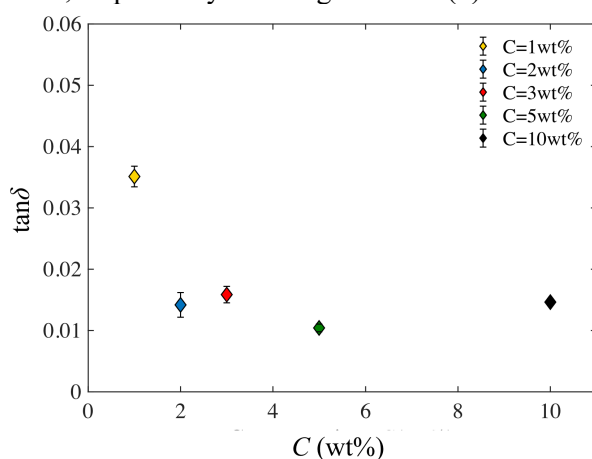


Figure S3. The angle $\tan\delta$ as a function of gel concentration C , where the markers and the error bars respectively correspond to the mean value of $\tan\delta$ in the plateau region of Figure S2(b) and the standard deviations of those fluctuations. Data for 1wt% is significantly large when compared to other gelatin concentrations.

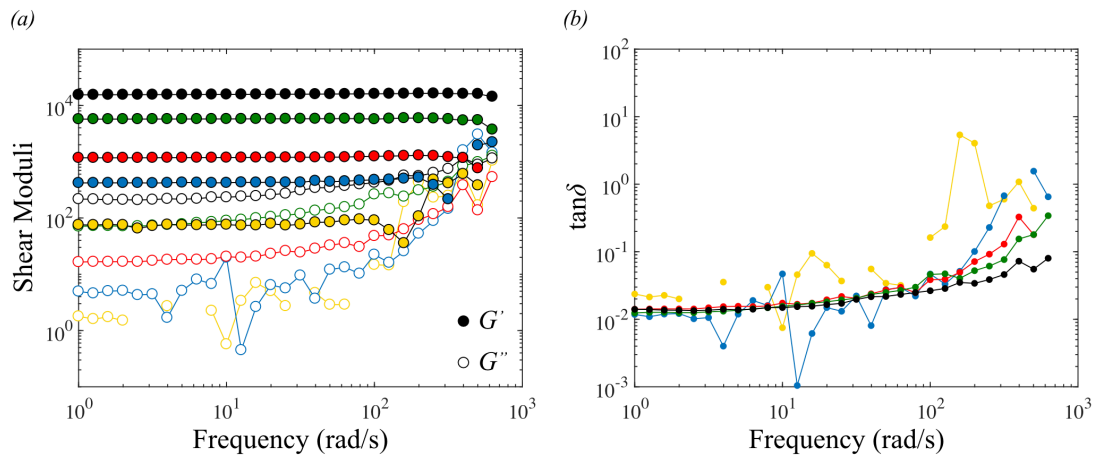


Figure S4. Measured rheology data of gelatin as a function of frequency (colors correspond to the concentration C presented in Figure 7 of the main manuscript). The definitions of each value are the same as that in Figure S2.