Electronic Supplementary Material (ESI) for RSC Advances.

Determination of the tensile properties

The tensile properties of the 3D rBC and 3D rBC-G scaffolds were determined using an Instron Universal Testing Machine (Model 4465; Norwood, MA, USA). Briefly, the dried samples were cut into rectangular strips (5 cm × 1 cm) with a thickness of 1 mm. Each end of the sample was placed in a metal clamp mounted on an Instron 4465. The elongation and maximum tensile strength before fracture were determined at room temperature. Triplicate experiments were performed and average values are reported.

Discussion: The Load applied vs. Displacement curve for 3D rBC and 3D rBC-G scaffolds are presented in Fig. 1S. The tensile strength and % strain of the samples were determined from the respective curves while Young's modulus was calculated from linear region of the stress strain curves. The recorded tensile strength of 3D rBC scaffolds was 4.18 ± 0.27 MPa and that of 3D rBC-G was 3.10 ± 0.32 MPa. Similarly, the modulus of 3D rBC was 0.61 ± 0.04 GPa and that of 3D rBC-G was 0.54 ± 0.17 GPa. However, the %strain at the break point of 3D rBC-G scaffolds was higher (1.05 ± 0.31%) than that of 3D rBC (0.94 ± 0.16%).

Good mechanical properties of scaffolds are associated with their shape-retaining ability during practical applications. The slightly lower tensile strength and Young's modulus of the 3D rBC-G scaffolds than the 3D rBC scaffolds can be attributed to the breakage of intermolecular hydrogen bonding in BC fibers owing to the insertion of gelatin[1]. However, the reverse trend was observed for % strain, which was higher for 3D rBC-G composite scaffolds than pure 3D rBC scaffolds. This change is attributed to the plasticity of gelatin, which increases the % strain of the 3D rBC-G scaffolds. Similar results have been reported previously; a gradual increase in % strain of BC-G composites has been observed with increases in gelatin content[1]. Our results showed that the 3D rBC-G composite scaffolds retained good mechanical properties with increased % strain compared to the 3D rBC scaffolds.

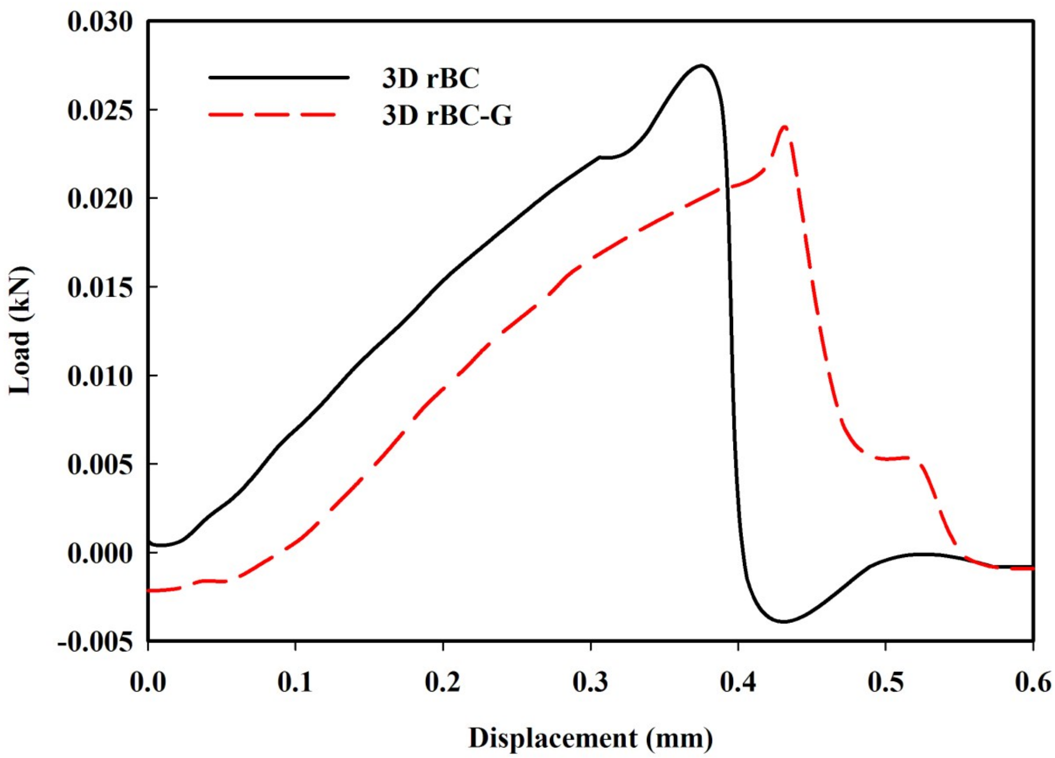

Fig. 1S. Tensile properties of the scaffolds. Load applied (kN) vs Displacement (mm) curve.

Reference

1. A. Nakayama, A. Kakugo, J. P. Gong, Y. Osada, M. Takai, T. Erata and S. Kawano, *Advanced Functional Materials*, 2004, **14**, 1124-1128.