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# On the prospect to fabrication of Cs/Bg/CNT nanocomposite scaffold and evaluation of its properties

**B Movahedi**
University of Isfahan, Iran

Scaffolds used in tissue engineering is often made of polymer, metal, ceramic and glass. Biodegradable polymers and ceramics are the best choice to fabricate the scaffold for tissue engineering. Chitosan is a linear cationic polysaccharide and because of its biocompatibility and excellent biological performance, it is a valid candidate for simulating extracellular matrix. Low mechanical strength and Young's modulus have limited the use of polymers in bone tissue engineering, especially bone in load bearing. On the other hand, ceramics are a bit brittle. Using both of them as nanocomposite scaffold is a very good choice. One of the most promising ceramics for bone tissue engineering is bioactive glass. In the present study bioactive glass (Bg), carbon nanotube (CNT) and chitosan (Cs) with different ratios were used for fabrication of porous composite scaffold. CNT was functionalized by immersing in sulfuric acid and nitric acid (3:1% volume). Cs/Bg/CNT nanocomposite scaffold was fabricated by hot press and salt leaching process. The SEM image of the overall scaffold was shown in figure 1. The mean pore size was measured by ImageJ software and obtained around 110±50 μm. The amount of released CNT after 30 days was measured within 6×10-4 and 1×10-3 mg/ml. Mechanical properties of the scaffolds were increased by addition of CNT. The compressive and tensile strength of the Cs/Bg/CNT nanocomposite were 5.25±0.5 and 1.35±0.5 MPa. According to the result of the experiments, nanocomposite scaffold was the best sample in matters of mechanical and chemical properties and most appropriate for trabecular bone tissue.

b.movahedi@ast.ui.ac.ir