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## Chitosan/HA composite scaffolds for controlled drug delivery

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Trabecular bone is severely affected by osteoporosis, therefore porous scaffolds identical to trabecular bone in porosity, density, and biomechanical properties are an area of intense research. In an effort, HPMC mediated synthesis of scaffolds containing HA and chitosan (CS) as major inorganic and organic phases; a mixture of HA, CS, and HPMC was homogenized and freeze dried to yield highly porous composite scaffolds. Five different compositions having different concentration of HPMC were synthesized. These scaffolds were characterized by FTIR, XRD, DSC-TG, UTM and SEM. The in vitro biodegradation of the composite scaffolds in the PBS solution with different incubation times was also investigated. The biocompatibility testing was performed through cell culturing techniques. Then the scaffolds were loaded with antibiotic (ibuprofen), and the release profile was checked. Scaffolds with different HPMC concentrations were elaborated with specific internal porosities for using as antibiotic carrier materials. UV spectrophotometry and bacteria inhibition tests (against *S. aureus* and *E. coli*) were performed for testing the antibiotic adsorption and the microbiological effectiveness after loading with Ibuprofen. The micro-porosity of scaffolds with different HPMC concentrations had different release times of antibiotics under mimic physiological conditions. Moreover, the PCL polymer, as a coating component, was used to effectively entrap the drug. PCL was coated prior to drug loading, as well as “simultaneous drug loading and PCL coating” experiment was performed to compare the release profile in both of the cases. The results suggested the possibility of a controlled drug release in the porous scaffold with PCL coating.

### Biography

Bushra Iqbal has completed her MS from University of The Punjab, Lahore, Pakistan at the age of 23. She is working as a Research Associate in Interdisciplinary Research Centre In Biomedical Materials, COMSATS Institute of Information Technology, Lahore Pakistan from last three years. Her current research is focused on the synthesis of composite scaffolds for controlled drug delivery.

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