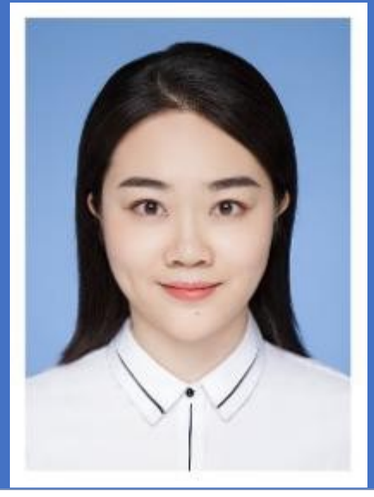
P7-12

Preparation of Graphene Oxide / Bionic Bone Cement Compsite and Its Regeneration Performance

ZUYI CHEN

Wuhan University



ABSTRACT

Dental Pulp, as the only loose connective tissue in teeth, is rich in cells,fibers, blood vessels, nerves and other extracellular matrix and it has the ability of protection, nutrition, aesthesis and dentin formation. Because of its importance, using tissue engineering and pulp stem cells to realize pulp regeneration will be the trend of endodontic treatment. Graphene Oxide, as the most impotant derivative of graphene, has fine biocompatibility. Chen et al. reported that GO can improve proliferation and adhesion of DPSCs and iPSCs. Our research group had invented a bionic bone cement, and it can improve the proliferation of Helas and NIH-3T3 cells. Its calcium is higher than MTA and iROOT BP plus. Owing to the great biological propreties of these two materials, our research team aims to succesfully combine GO and Bionic Bone Cement andstudy its pulp regeneration performance in vitro.

MATERIALS AND METHODS:

In our study, we introduced 0%, 0.02%, 0.04%, 0.06% and 0.08% w/v GO into previously made Bionic Bone Cement. We study its chemical composition using FT-IR and its surface morphology using scanning electron microscope. Furthermore, we study its ability of improving cell proliferation in vitro.

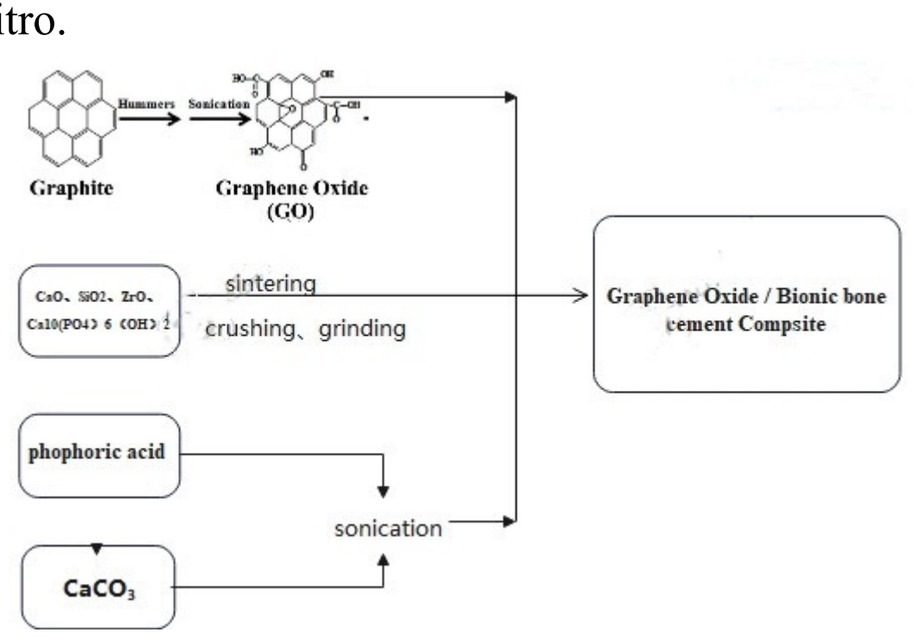


Figure 1: Schematic diagram for preparation of GO/Bionic Bone Cement Compsite

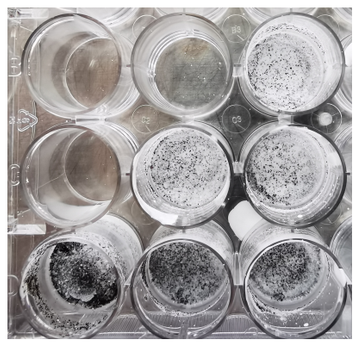


Figure 2: Photograph of GO/Bionic Bone Cement Compsite

RESULTS:

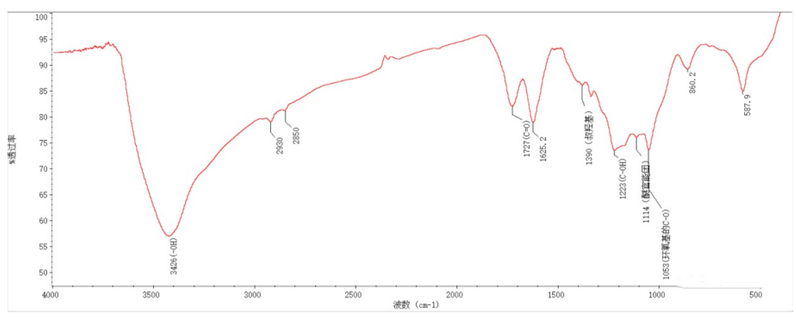


Figure 3 : FT-IR of GO/Bionic Bone Cement Compsite

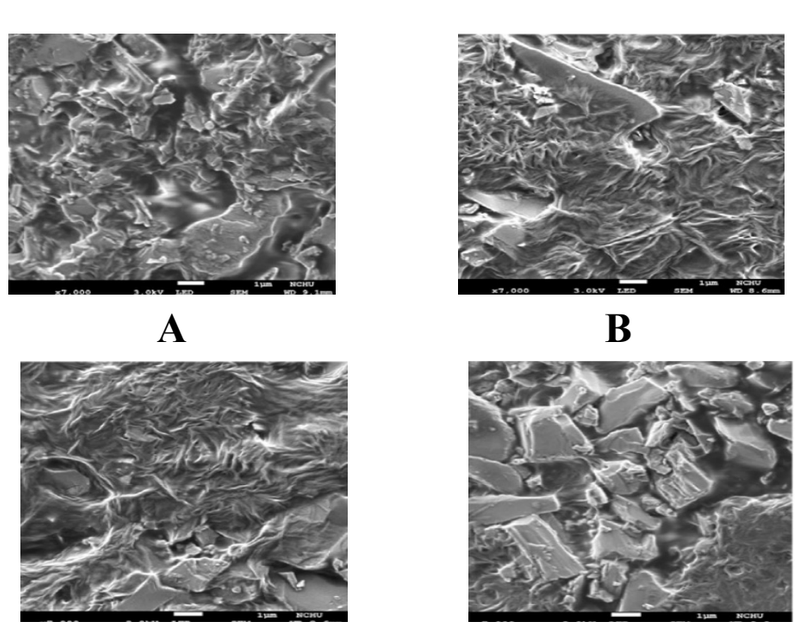


Figure 4: SEM of GO/Bionic Bone Cemnt Compsite; A:0.02% w/v, B:0.04% w/v, C:0.06% w/v, D:0.08% w/v.

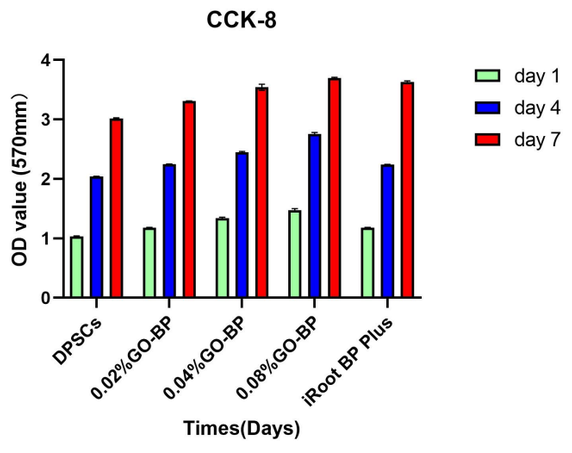


Figure 5: Cell culture results for the GO/Bionic Bone Cement Compsite

Discussion:

According to our present study, the 0.08% GO/Bionic Bone Cement Compsite group showed significantly high DPSCs adhesion and proliferation in vitro. In future study, we hope to further confirm its performance in pulp regeneration and study its molecular mechanism.