

Preparation and characterization of graphene oxide foils for applications in the biomedical field

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Graphene oxide (GO) is the oxidized derivative of graphene. It retains some of the exceptional features of graphene and the capacity to be well dispersed in water.¹ The good *in vitro* biocompatibility of GO has paved the way for investigating it in numerous biomedical applications.²

In the present study we report the synthesis of GO foils, characterized by cross-linked GO sheets that impart to the foil an extraordinary stiffness and strength,³ with the aim of exploiting their capacity to induce differentiation of Dental Pulp Stem Cells (DPSCs) towards the osteogenic/odontogenic lineage.⁴ The obtained foils have been investigated in terms of structure via Scanning Electron Microscopy (SEM) measurements, surface topography and nanomechanical characterization via Atomic Force Microscopy (AFM) measurements and stability in aqueous fluids. After proper sterilization, DPSCs were cultivated on GO foils for 28 days and conventional cell viability assays were performed to follow the growth process. DPSCs differentiation towards the osteoblastic lineage was investigated by measuring alkaline phosphatase (ALP) activity.

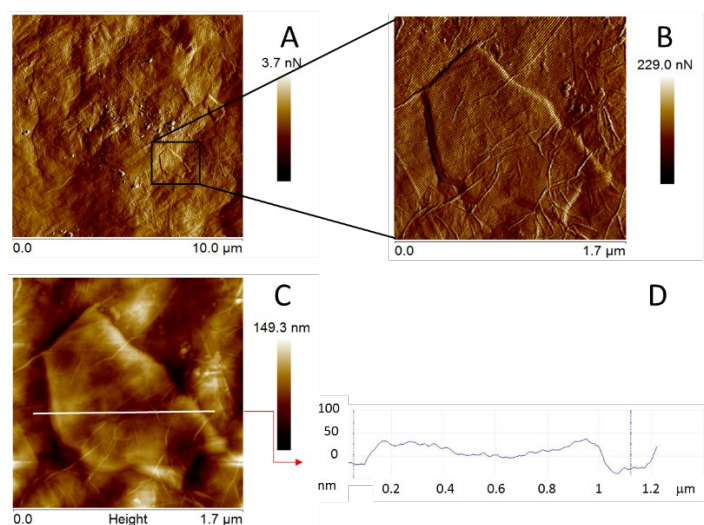


Figure 1: AFM images of GO foil obtained with Peak Force QNM reporting: A) peak force error ($10 \mu\text{m} \times 10 \mu\text{m}$), B) inset of image A; C) and D) high of the inset B in planar and trace profile, respectively.

References:

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