

# 4<sup>th</sup> Annual Conference and Expo on **Biomaterials**

February 25-26, 2019 | London, UK

## Bioconjugation studies of GO/Fe<sub>3</sub>O<sub>4</sub> nanocomposites hollow/porous magnetite

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In this paper, we have synthesized reduced graphene oxide/magnetite (rGO-Fe<sub>3</sub>O<sub>4</sub>) nanocomposites by chemical co-precipitation method for a comparative Raman spectroscopic study. The nanocomposites along with its pristine GO and Fe<sub>3</sub>O<sub>4</sub> counterpart were modified covalently with a fluorescently labeled protein. The modification was confirmed using confocal fluorescence microscopy. The GO, Fe<sub>3</sub>O<sub>4</sub> and rGO-Fe<sub>3</sub>O<sub>4</sub> samples were characterized by different spectroscopic and microscopic techniques before and after protein conjugation. A significant enhancement in Raman peaks obtained in case of protein modified rGO-Fe<sub>3</sub>O<sub>4</sub> nanocomposites compared to pristine GO and Fe<sub>3</sub>O<sub>4</sub> explains active Surface Enhancement Raman Spectroscopy (SERS) effect. An unusual phenomenon of GO to rGO conversion and vice-versa was noted as a result of covalent protein attachment.

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