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## MS04-P02

## Synthesis and Characterization of Cross-Linked Lysozyme Crystals filled with Single-Walled Carbon Nanotubes Bionanomaterials

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Novel bionanomaterials are hybrid materials that include the combination of biomolecules and inorganic substances to generate, enhance or support relevant properties. Bionanomaterials have useful applications in bio- and nanotechnology applications<sup>1,2</sup>. Among the biomolecules used to prepare hybrid materials, proteins have shown to be versatile materials thanks to their capacity to self-assembly in crystalline form generating a porous network of nanometer size. The internal cavities of the protein have the ability to act as template<sup>3,4</sup> and it gives the material the possibility to extrapolate nanoscale properties to macroscopic materials for practical applications.

In this work, we present a new methodology to homogeneously incorporate inorganic particles within protein crystals using dipeptide hydrogels as growth media. To exemplify this methodology, we have obtained lysozyme crystals incorporating single walled carbon nanotubes at different concentration. Crystals were grown in Fmoc-PhePhe-OH hydrogels<sup>5</sup>. The influence of the nanotubes on the diffraction properties, hardness, enzymatic activity and conductivity will be presented and discussed, as well as a full characterization of these new materials.

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