



# **EuChemS**

## Chemistry Congress

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**28 August to 1 September  
2022 · LISBON.PT**

**Detailed programme**

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## Novel molecularly imprinted impedimetric biosensor based on polypyrrole and decorated graphene oxide for the routine monitoring of Lysozyme

**P. Montoro-Leal<sup>a</sup>, Isaac A.M. Frías<sup>b</sup>, E. Vereda Alonso<sup>a</sup>, Abdelhamid Errachid<sup>b</sup>, Nicole Jaffrezic-Renault<sup>b</sup>**

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In this work, a novel molecularly imprinted polymer based on polypyrrole (PPy) and decorated graphene oxide (GO@Fe<sub>3</sub>O<sub>4</sub>) was developed for the sensitive detection of lysozyme (LYS). The synthesized material (MIPPy/GO@Fe<sub>3</sub>O<sub>4</sub>) was electrodeposited with LYS as a template on gold microelectrodes. Transmission electron microscopy (TEM) and X-ray photoelectron spectroscopy (XPS) were used to confirm the adequate preparation of GO@Fe<sub>3</sub>O<sub>4</sub>, and the characterization of the resulting microsensors was carried out with the following analytical techniques: electrochemical impedance spectrometry (EIS), FT-IR analysis and scanning electron microscopy (SEM). An equivalent circuit was suggested to quantitatively analyse each component of the sensor system. EIS was also used for the determination of LYS in a wide linear range from 1 to 1 10<sup>5</sup> pg/mL, presenting good precision (RSD ≈ 10%, n = 5) and low limits of detection and quantification (LOD = 0.009 pg/mL and LOQ = 0.9 pg/mL, respectively). Meanwhile, the microsensor showed a high sensitivity, a good selectivity and reproducibility. The construction process was relatively simple, and provided a rapid and economical method for the routine monitoring of LYS. The microsensor was successfully applied for the detection of this protein in fresh chicken-egg white sample and commercial drug.

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