

Label-Free Graphene Oxide-Based Surface Plasmon Resonance Immunosensor for the Quantification of Galectin-3, a Novel Cardiac Biomarker

Primo, Emiliano N.

Kogan, Marcelo J.

Verdejo, Hugo E.

Bollo, Soledad

Rubianes, María D.

Rivas, Gustavo A.

© 2018 American Chemical Society. We report the first optical biosensor for the novel and important cardiac biomarker, galectin-3 (Gal3), using the anti-Gal3 antibody as a biorecognition element and surface plasmon resonance (SPR) for transducing the bioaffinity event. The immunosensing platform was built at a thiolated Au surface modified by self-assembling four bilayers of poly(diallyldimethylammonium chloride) and graphene oxide (GO), followed by the covalent attachment of 3-aminophenylboronic acid (3ABA). The importance of GO, both as the anchoring point of the antibody and as a field enhancer for improving the biosensor sensitivity, was critically discussed. The advantages of using 3ABA to orientate the anti-Gal3 antibody through the selective link to the Fc region were also demonstrated. The new platform represents an interesting alternative for the label-free biosensing of Gal3 in the whole range of clinically relevant concentrations (linear range between 10.0 and 50.0 ng mL⁻¹,