Immobilization of Proteoliposomes containing Leishmania antigenic proteins in Polymeric Nanocomposites for Biosensing.

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The processing of biological materials at the nanoscale in a controlled manner has been the key for many technological applications, especially in cases where immobilization at solid supports are required. Liposomes are good examples of nanobiocomposites, in which different substances can be incorporated into phospholipidic membrane using supramolecular strategies. Recently, nanostructured films have been employed to immobilize proteoliposomes carrying antigens onto Au-interdigitated substrates to recognize specific antibodies. PAMAM and proteoliposomes were used at 1 and 0.7 mg/mL, respectively, in a 5 mM Tris-HCl pH 7.5 buffer solution. Nanostructured LbL films containing up to 15 PAMAM/proteoliposome bilayers were assembled on quartz slides for UV-visible measurements and five-bilayer PAMAM/proteoliposome films were deposited onto the interdigitated electrodes for capacitance measurements. The sensors were able to distinguish between specific and non-specific IgGs. In this study we employed antigen-containing liposomes (proteoliposomes), which were able to recognize specific anti-*L.amazonensis* antibodies. Detection was carried out using electrical measurements and to enhance sensitivity we combine the response of three different sensing units. Specific IgGs were detected at concentrations as low as ng/mL. Furthermore, the sensors showed a linear response toward anti-*L.amazonensis* antibodies in a range from 10^{-6} to 10^{-5} mg/mL. Due to the molecular recognition capability, a distinction can be made between specific and non-specific IgG. The biosensor reported here might have a large impact for clinical tests, due to its fast response in a few minutes and the low cost. Financial support: FINEP, FAPESP, CNPq and CAPES.