Sensitive Electrochemical Immunosensor for Matrix Metalloproteinase-3 based on Single-wall Carbon Nanotubes


Supporting Information

Figure S1. Raman spectra of (a) the vertically aligned single-wall carbon nanotubes arrays on pyrolytic graphite compared to (b) nafion coated pyrolytic graphite without SWCNT.
Figure S2. Optimization of Non-specific binding (NSB) events using various concentrations of BSA and Tween 20 and different washing strategies. (A) Showing the effect of diluting the secondary antibody using PBS buffer containing 2% BSA + 0.05% Tween-20 and 2% BSA in the blocking step. (B) Showing results obtained using PBS buffer + 0.05% Tween-20 without BSA as diluent for Ab2 while keeping 2% BSA in the blocking step. This dilution produced lower levels of NSB (represented by the controls) as well as lower standard deviations. (C) Shows a combination of new washing strategy involving spinning the electrodes in beakers with magnetic stirrer and spin-bars as well as optimum concentration of BSA in the blocking step and Tween 20 in the wash buffer at 0.5% and 0.1%, respectively. This conditions gave the lowest NSB conditions, hence the greatest difference between controls and the 4 ng mL\(^{-1}\) MMP-3 sample in 10 \(\mu\)L calf serum.
Figure S3. TEM images of homogenous dispersions of polymeric microspheres on copper grids (a) not derivatized with protein; and (b) derivatized as HRP-polybead- Ab\textsubscript{2} bioconjugate.