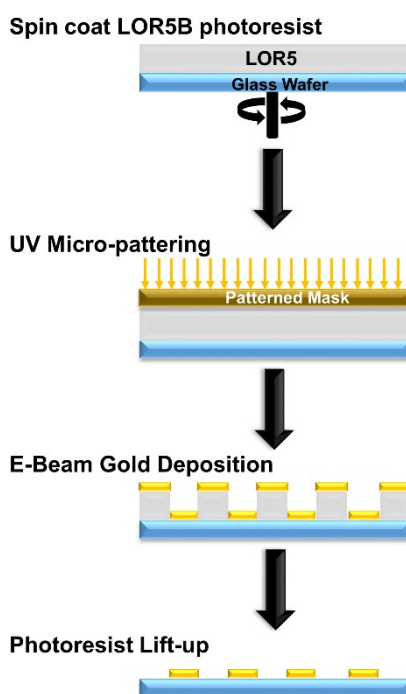


## Interfacial capacitance immunosensing using interdigitated electrodes: effect of the insulation/immobilization chemistry

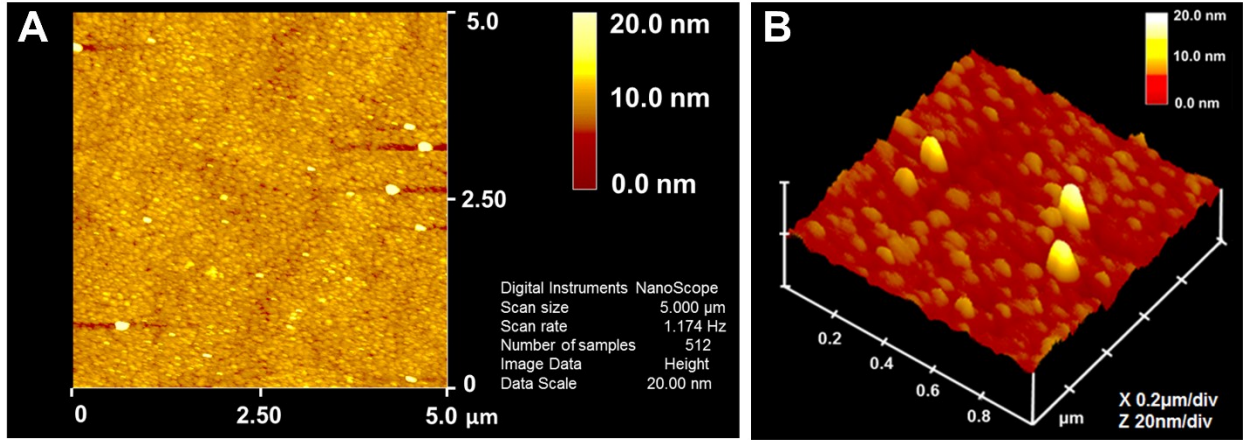
F. Rafael. Castiello<sup>a</sup>, James Porter<sup>a</sup>, Paresa Modarres<sup>a</sup> and Maryam Tabrizian<sup>a,b</sup>

<sup>a</sup> Biomedical Engineering Department, McGill University, Montreal, QC, Canada.

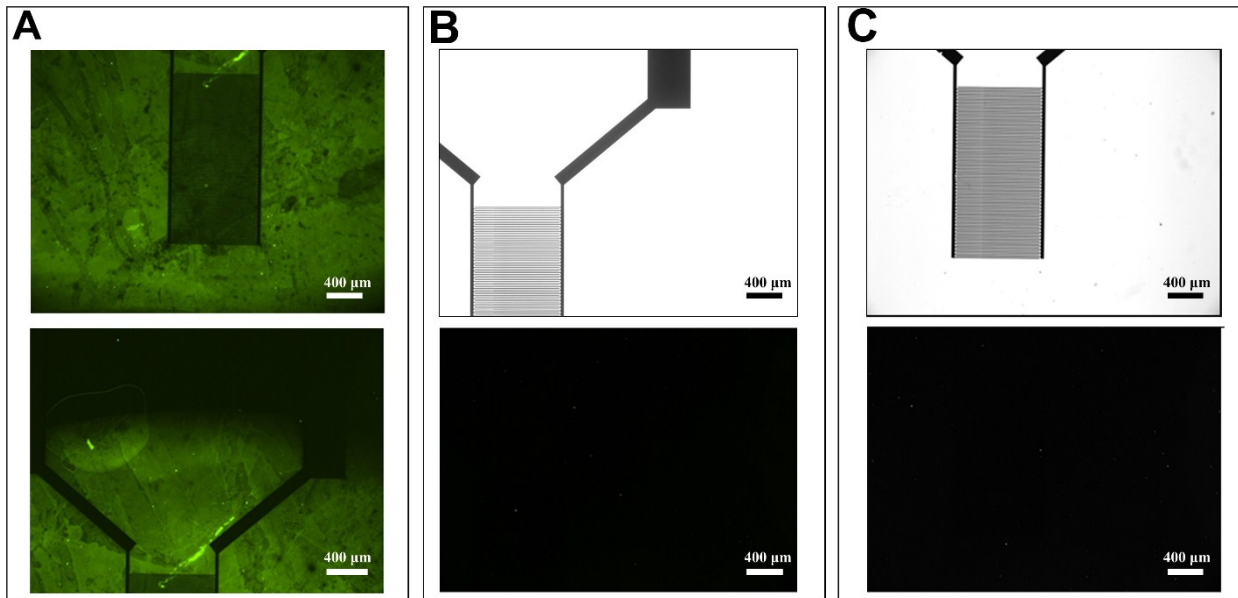
<sup>b</sup> Faculty of Dentistry, McGill University, Montreal, QC, Canada.



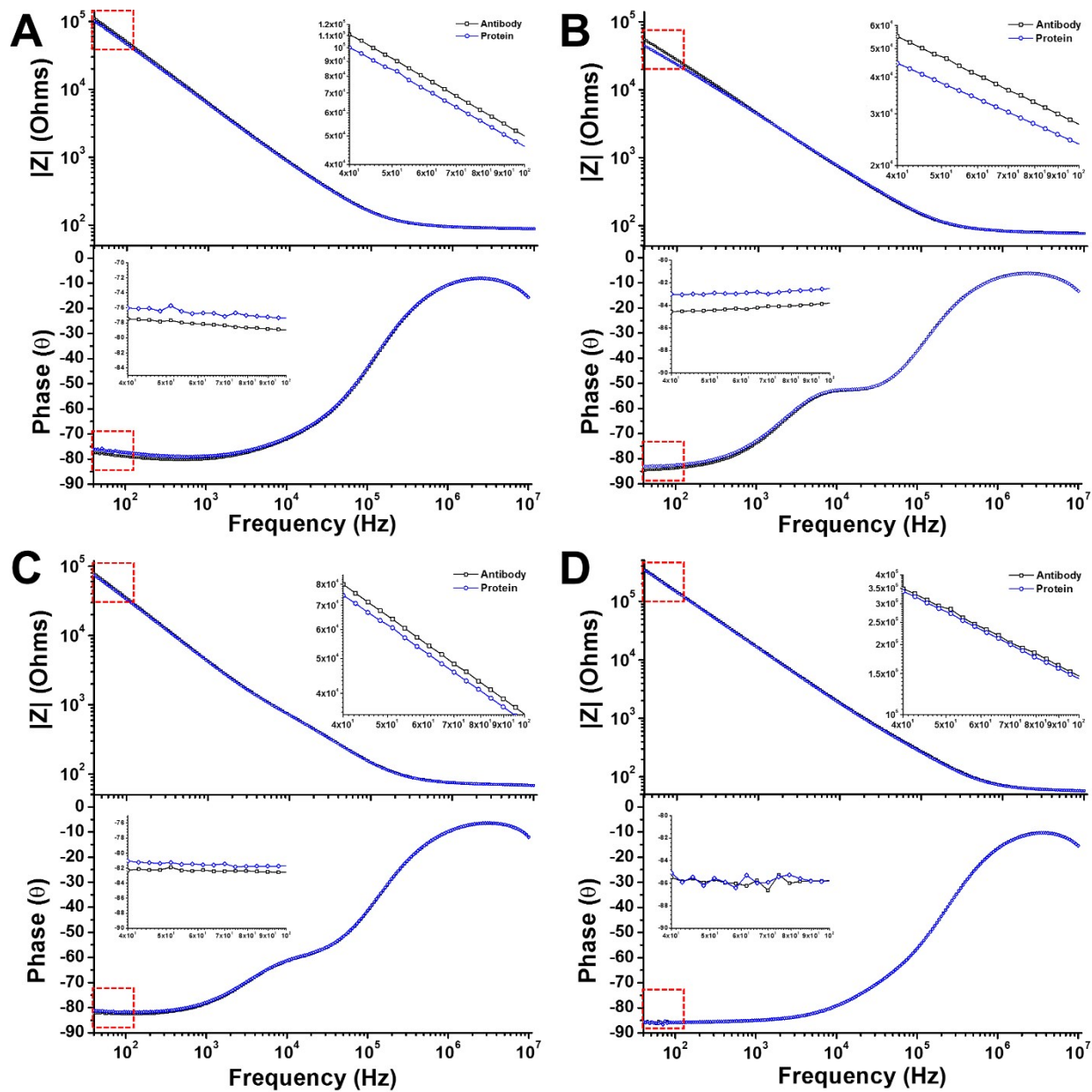
**Figure S1:** Schematic representation of the microfabrication process used to produce interdigitated electrodes (IDEs). First, LOR5B™ (Microchem, Newton, MA) is spin-coated onto the glass substrate and baked. Subsequently, a layer of Microposit™ S1813™ (Shipley, Marlborough, MA) is spin-coated and baked. The substrate is then exposed to UV light under a chrome photomask. After development of the IDE patterns with Microposit MF®-319 (Shipley) developer, 10 nm of titanium and 50 nm of gold are deposited onto the wafer. Finally, the substrate is immersed in Microposit Remover 1165 (Shipley) to lift off the metal layer and reveal the patterned electrodes.



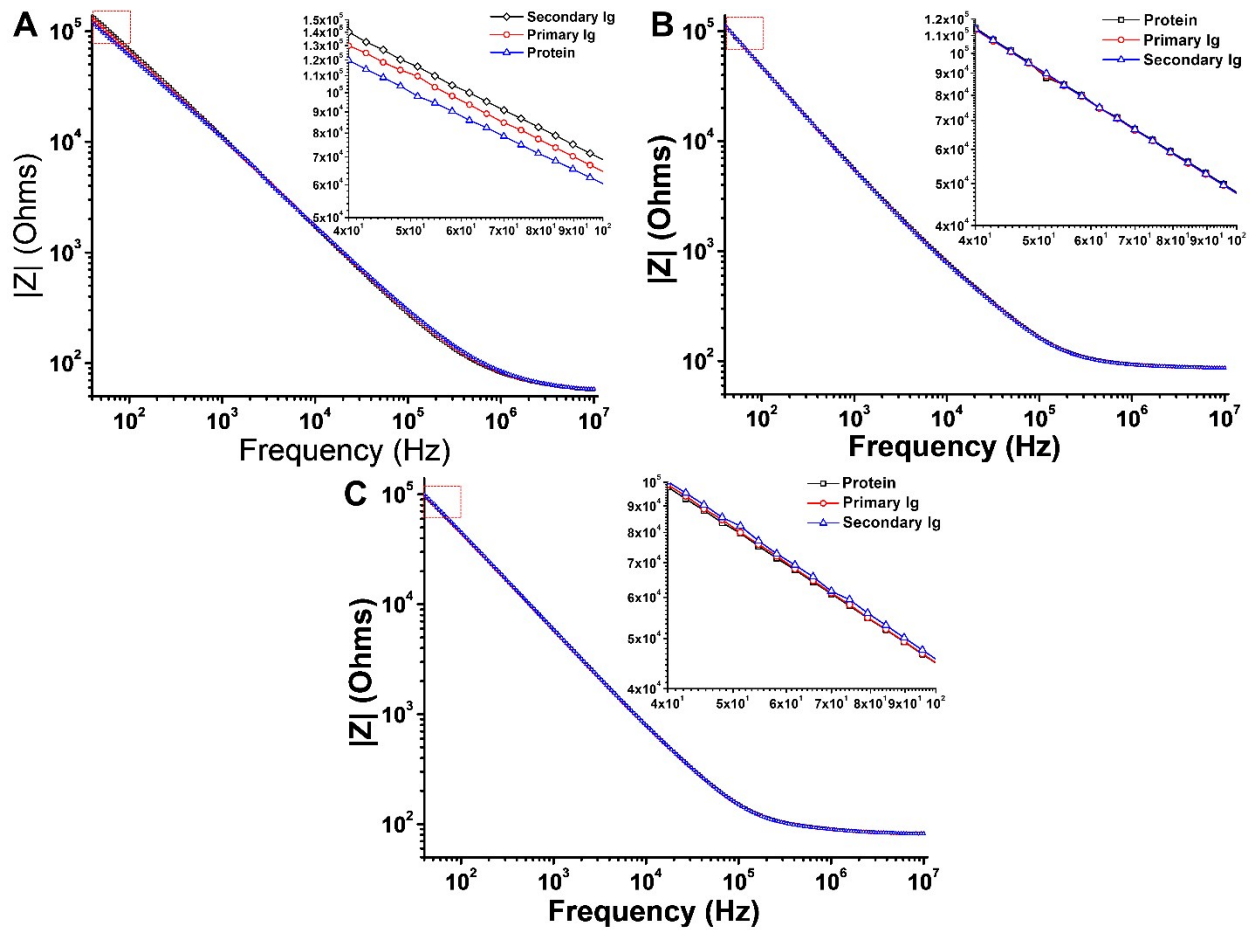
**Figure S2:** 5  $\mu\text{m}^2$  area on top of IDE electrode with passively adsorbed sensing antigens and blocking proteins in **A)** 2D, and **B)** 3D views.



**Figure S3:** Fluorescent images of an immunoassay for: **A)** the specific assay and a PMMA surface functionalized with a **B)** non-specific antigen and **C)** no antigen as two controls. The images seen on the top and bottom correspond to the same area in light and fluorescent mode, respectively.



**Figure S4:** Typical impedance and phase spectra before and after antigen-antibody binding for: **A)** PMMA conformal coating, **B)** alkyl thiol SAM on the Au electrode surface, **C)** APTES on the gaps between electrodes, **D)** conformal coatings via passive adsorption of the antigen. Graph insets correspond to the red box area showing an enlarge image of the low frequency portion of the spectra to illustrate the line shift.



**Figure S5:** Typical impedance spectra of a PMMA-functionalized sensor before and after antigen-primary antibody binding and binding of a secondary antibody for: **A)** the specific assay, **B)** a non-specific antigen and **C)** no antigen as two controls. Graph insets correspond to the red box area showing an enlarge image of the low frequency portion of the spectra to illustrate the line shift.