Electronic Supplementary Material (ESI) for Analyst.

Functionalized orthopaedic implant as pH electrochemical sensing tool for smart diagnosis of hardware infection

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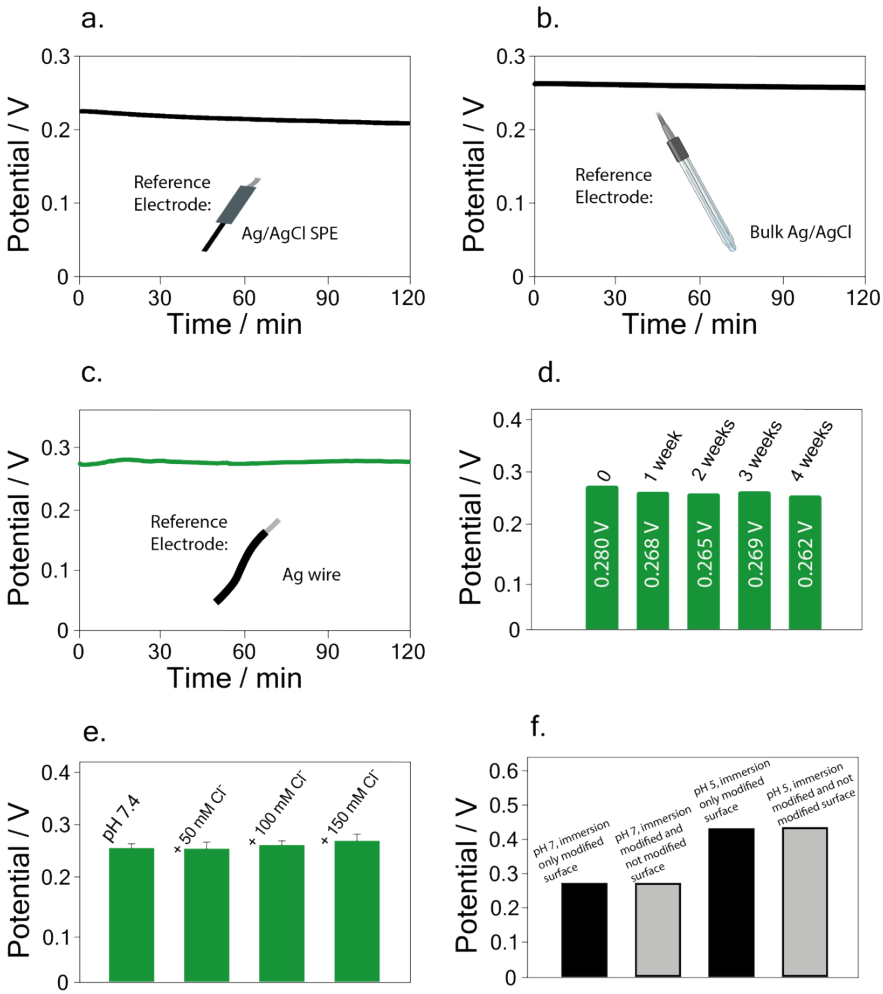

Fig. S1 Drift evaluation of the developed sensor carried out in Britton-Robinson solution at pH 7, using as reference electrodes the screen-printed Ag/AgCl pseudo reference electrode (a), the bulk Ag/AgCl reference electrode (b) and the wire Ag wire electrode (c). Histogram bars obtained measuring a Britton-Robinson buffer at pH 7, using the iridium-modified titanium-based implant the same day of the electrodeposition and after 1, 2, 3, and 4 weeks from the electrodeposition (d). Histogram bars obtained measuring a Britton-Robinson buffer at pH 7, at chloride concentrations equal to 50 mM, 10 mM, and 150 mM (e). Histogram bars obtained immersing the iridium oxide modified surface implant (black) and the whole implant (grey) (namely, comprising the non-modified and modified surface) for the measurements of Britton-Robinson buffer solutions at pH 7 and 5.

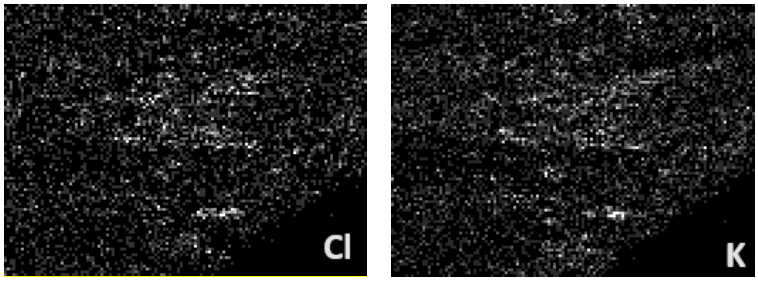

Fig. S2 EDX mapping results showing the distribution of Cl and K signals. In detail, the uniform distribution of the Ir coating reported in Figure 3i is confirmed by analyzing the maps obtained from chlorine and potassium signals, which are caused by salt residues, comparing them to the Ir spectrum (Fig. 3i). As opposed to the Ir map reported in Figure 3i, the EDX maps of Cl and K, as salt residues, show brighter spots, demonstrating the uneven distribution on the sample surface.