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## Influence of oxygen content on the antibacterial effect of Ag<sub>x</sub>-O<sub>x</sub> coatings deposited by magnetron sputtering

Ag and AgO<sub>x</sub> thin films were deposited by pulsed DC magnetron sputtering, for stents devices, in order to provide antibacterial properties. During the deposition process, oxygen flow was varied (0-15 sccm) to understand the influence of oxygen species in the physical, chemical and structural properties of thin films. Coatings morphology was observed by scanning electron microscopy (SEM) and their nanostructure and composition were assessed by X-ray diffraction (XRD) and X-ray photoelectron spectroscopy (XPS) and energy dispersive spectroscopy (EDS), respectively. XRD and XPS analyses revealed that Ag thin films are composed by metallic Ag, which crystallizes in fcc-Ag phase; whereas AgO<sub>x</sub> showed a mixture of Ag<sub>2</sub>O and AgO phases for low oxygen fluxes that became

single AgO with the increase of oxygen flow. Surface wettability and surface tension of the coatings were also determined showing hydrophobic character. Halo inhibition zone tests were performed against *Staphylococcus epidermidis*, in order to evaluate the antibacterial behavior of coatings, and silver ion release was measured. Only AgOx presented antibacterial behavior, showing that the presence of silver oxide are the main reasons for the antibacterial effect, probably due to the increased production of ROS (Reactive Oxygen Species), making these coatings promising for stents' applications.