The need for reliable and fast response time and low cost devices to monitor the environment motivated researchers to develop new materials for application in sensors and biosensors. In this study, we report on nanostructured layer-by-layer (LbL) films with different architectures using chitosan (Chi) and carbon nanoparticles (carbon Black, carbon Printex and Quantum Dots) to modify electrodes as they may facilitate signal transduction between the electrode and the bioactive layer. The architectures were prepared with a solution containing chitosan solution in 0.3 M acetic acid/0.2 M sodium acetate buffer (pH 4.5) at 1mg/mL, carbon black [1] and Printex 6L carbon [2] solution in Triton X-100, while the quantum dot solution was obtained in water at 1 mg/mL. The deposition process was carried out by immersing the substrate in chitosan solution for 15 min and in carbon nanoparticles solution for 15 min. After each deposition step, the film was washed with ultrapure water and gently dried with constant flow nitrogen. Three LbL nanostructured films were fabricated: i) (Chi/Carbon Black), ii) (Chi/Printex Carbon) and iii) (Chi/Quantum Dot), with different number of bilayers. These architectures were characterized using electrochemical impedance spectroscopy (EIS) and cyclic voltammetry (CV), from which we concluded that increasing the number of bilayers from 3 to 5 led to no significant signal increase. CV and square ware voltammetry (SWV) were used in the detection of the redox probe K_3[Fe(CN)_6]/K_4[Fe(CN)_6] between 0 and 145 µmol L^{-1}, with limit of detection of 0.28 µmol L^{-1}. Therefore, these architectures are promising as platform for sensors and biosensors.

**Keyword:** Chitosan, nano carbon, LbL films, biosensor.

**Acknowledgments:** Fapesp, INEO, nBioNet, Fundunesp, Capes, CNPq, LMF/LNNano/CNPEM.

**References:**