The introduction of molecules with biological properties on textile materials is essential for a number of biotechnological applications. With the purpose of testing new processes applied to textiles, in this study, we present the first results on the feasibility of using the Layer-by-Layer (LbL) deposition process in natural fibers such as cotton, with natural polyelectrolytes like chitosan (CH) and alginic acid sodium salt (ALG).

Three characterization methods to assess electrostatic LbL deposition were performed: the contact angle between a liquid (water) and the sample surface, in order to characterize the wettability of the samples with the different layers of CH and ALG; dyeing of the CH/ALG assembled cotton fabric with cationic methylene blue that shows regular changes in terms of color depth (K/S value), which indicate that the surface were alternately deposited with CH and ALG layers and, finally, the analysis by infrared spectroscopy using Fourier Transform with Attenuated Total Reflection (ATR-FTIR), to assess the changes in the interaction between CH and ALG deposited on cotton samples. The antibacterial activity of cotton samples was evaluated against Klebsiella pneumoniae (ATCC 13883) and Staphylococcus aureus (ATCC 25923).