Pseudomonas aeruginosa is a pathogenic microorganism, where its ability to adhere to host tissues is essential for initiating infection. Adhesion mediated by host cell-surface glycoconjugates, which are a specific target for bacterial receptors [1]. Such oligosaccharide-mediated bacterium-cell recognition are crucial in the early steps of P. aeruginosa pathogenesis. P. aeruginosa adhesion mediated by a glycan recognition pattern involve, the membrane soluble lectin LecA (PA-IL), that specifically bind galactose and may play a role in adhesion to the epithelial cells of the infected host. Here, we report the synthesis of the poly(γ-glutamic acid)-4-aminophenyl γ-D galactopyranoside bioconjugate (γ-PGA-NH₂PheGal) that eventually will be used as a tool to recognize pathogenic P. aeruginosa. To synthesize γ-PGA-NH₂PheGal bioconjugate, the free carboxylic group of the microbial γ-PGA polymer was functionalized with propargylamide groups and 4-aminophenyl γ-D-galactopyranoside bonded to an azide-terminal group. These intermediates were synthesized in several steps. The obtained intermediates were used to synthesize the γ-PGA-NH₂PheGal bioconjugate by an azide-alkyne cycloaddition that selectively gives 1,2,3-triazoles, in this copper-catalyzed reaction. The entire synthesized compound were characterized by NMR, FTIR and TGA techniques. The γ-PGA-NH₂PheGal bioconjugate will used to prepare electrospun nanofibers and challenge against P. aeruginosa to find out the specificity to bind this microorganism.

Keywords: Poly(γ-glutamic acid), Galactose, Pseudomonas aeruginosa

References:


Presenting author's email: daavid_mora@hotmail.com