



MASTER'S DEGREE IN BIOMEDICAL RESEARCH

Research Project Proposal

Academic year 2023-2024

Project Nº 55

Title: The role of poly-N-acetyl-glucosamine (PNAG) in *Serratia marcescens*: biofilm formation, resistance to serum killing, and phagocytosis by polymorphonuclear cells.

Department/ Laboratory: Department of Microbiology and Parasitology-Edificio de Investigación

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Summary

The aim of this project is to investigate the expression and function of the surface polysaccharide PNAG (poly-N-acetylglucosamine) in *Serratia marcescens*. Specifically, the project focuses on understanding the role of PNAG in biofilm formation, serum resistance, and resistance to phagocytosis by polymorphonuclear cells (PMNs). Additionally, the project aims to explore the prevalence of PNAG production among clinical isolates of *S. marcescens*.

To achieve these goals, a multi-faceted methodology will be employed. Firstly, bacterial strains of *S. marcescens* from our collection will be tested for PNAG expression by immunoblot analysis. In addition, the role of PNAG in biofilm formation will be investigated using assays previously optimized in our laboratory for other Gram-negative bacterial pathogens.

To understand the impact of PNAG on serum resistance and resistance to phagocytosis, *in vitro* experiments using human serum and immune cells (PMNs) will be conducted. These experiments will involve assessing bacterial survival in the presence of active and heat-inactivated human complement, as well as the phagocytic uptake and killing of *S. marcescens* cells.

The project's findings will provide valuable insights into the role of PNAG in *S. marcescens* pathogenesis and its potential as a target for therapeutic interventions.

yes	
no	X

Does the project include the possibility of supervised animal manipulation to complete the training for animal manipulator?