TITLE: EXPERIMENTAL EVALUATION OF BibA ADHESIN FROM GROUP B STREPTOCOCCI (*Streptococcus agalactiae*) AS A PROTEIN-TARGET FOR A NEW VACCINE APPROACH

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ABSTRACT:

Streptococcus agalactiae, also known as Group B Streptococcus (GBS) is a main cause of invasive diseases among neonates, immunocompromised patients and elderly. Despite the advances made in the prevention and treatment of neonatal diseases using antibiotics, sepsis and meningitis caused by GBS are still a significant health public concern globally. Colonization by GBS occurs in the vaginal and gastrointestinal tract of approximately 30% of pregnant women. Adoption of intrapartum prophylaxis decreased the incidence of early-onset diseases, but was associated with the increase of infections by gram-negative bacteria, and did not have an effect against late-onset sepsis. By that, additional preventions and therapeutic strategies against GSB infection are still highly desirable. This project aims to develop an alternative vaccine strategy capable of conferring protection against colonization by *S. agalactiae.* For this aim, we selected the surface protein as target antigen, the bacterial immunogenic adhesin BibA, involved in the immune system evasion. The corresponding gene was amplified, cloned into the expression vector pET28a and the recombinant protein was expressed in *Escherichia coli* BL21 (DE3) strain. This protein was purified (4 mg/mL) and used for immunization of C57BL/6 mice, using Alum and LTK63 as adjuvants. These formulations resulted in high titles of BibA-specific antibodies after the third immunization. Both polyclonal sera were capable to recognize different GBS serotypes by whole cell ELISA assay. Polyclonal sera were tested in *in vitro* assays to evaluate the functionality of the antibodies generated. GBS opsonized with pool of sera raised against BibA-LTK63 formulation resulted in reduced bacterial invasion in A549 epithelial cells, and significative increase of GBS killing by J774 macrophage cells in opsonophagocytic killing assay (OPK). Mice immunized were subjected to vaginal colonization challenge and 80% of protection were obtained from BibA-LTK63 formulation. This promising approach intends to be an alternative to the regular preventive strategies presently available to affected subjects, reducing *S. agalactiae* disease prevalence.

Keywords: Vaccine, recombinant, GBS, *Streptococcus agalactiae*, invasion, OPK, colonization.

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