Medicines & Healthcare products Regulatory Agency

Investigation into the Potential of two conserved recombinant proteins as Group B Streptococcus Vaccine Candidates and Carriers

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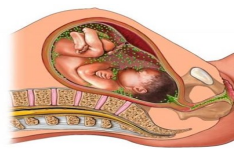
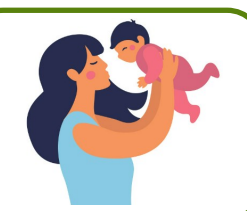
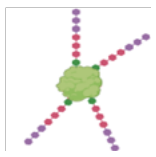
INTRODUCTION



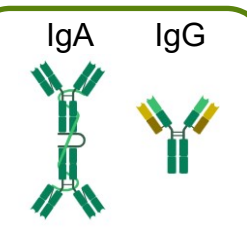
GBS infection in the new-borns results generally from the intrapartum acquisition of the organism from their rectovaginal colonised mothers.



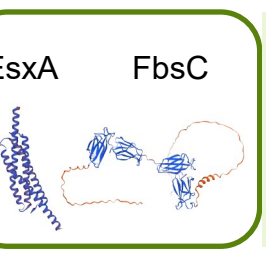
An ideal maternal vaccine should protect the baby and prevent colonisation in the pregnant woman to eliminate the risk of GBS transmission to the baby.



Current GBS conjugate vaccine strategy given parenterally does not target maternal colonisation.

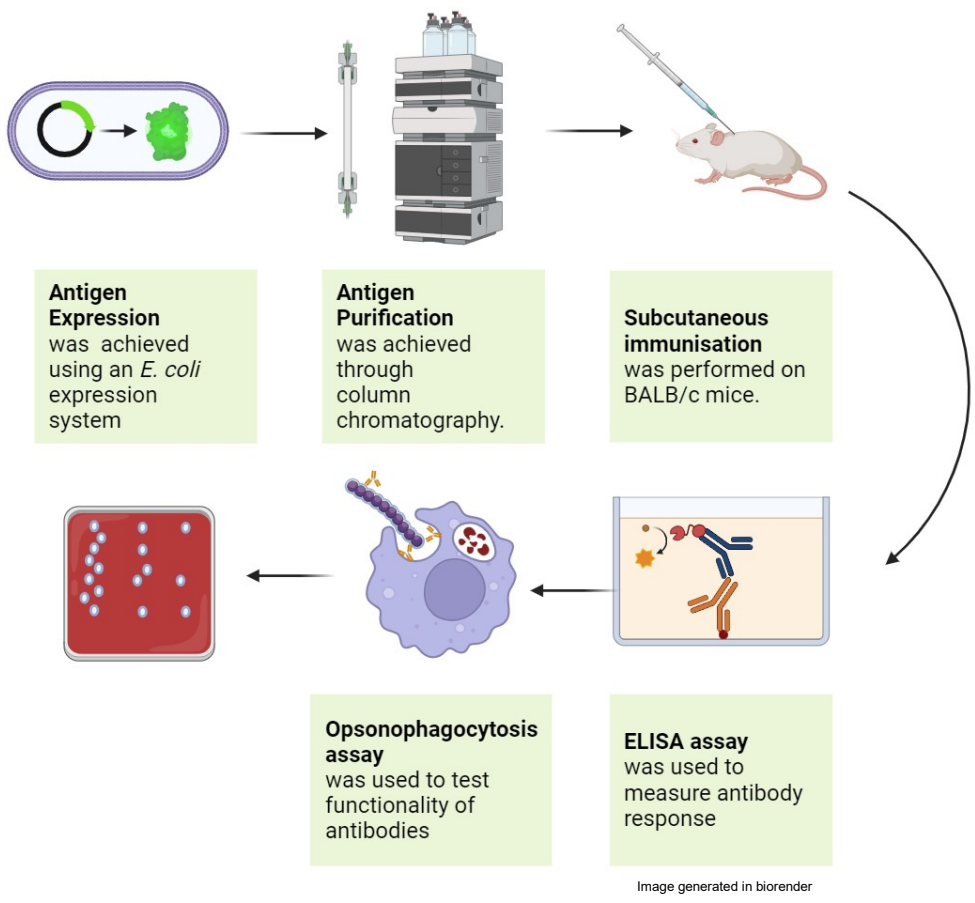


In this project we investigate alternative GBS protein antigens that may prevent colonisation. That can be used as glycoconjugates to enhance coverage or administered mucosally for induction of both systemic and a better mucosal immunity.



FbsC is a cell wall anchored fibronectin binding protein and EsxA is a secreted protein, both implemented in bacterial adhesion. EsxA is also under investigation as a vaccine target for other bacteria.

MATERIALS AND METHODS



RESULTS

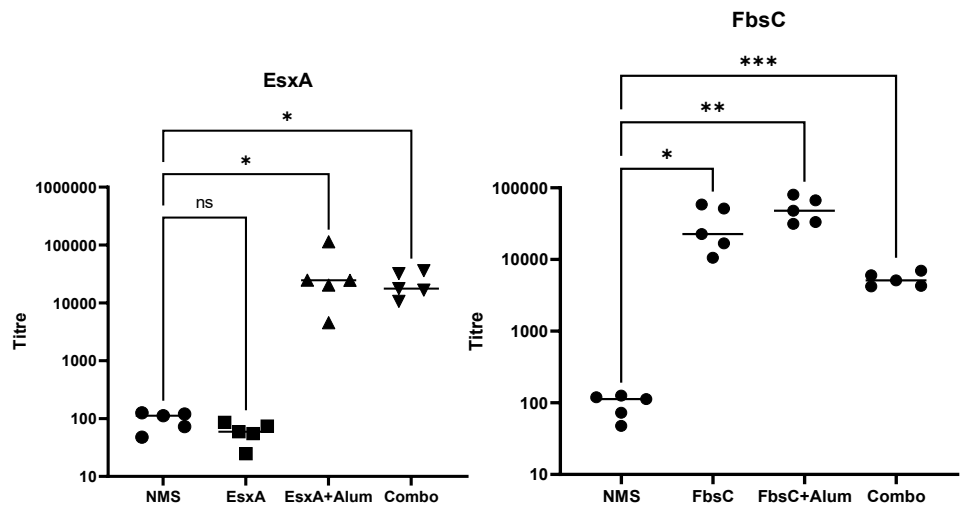


Fig 1: IgG antibody titers measured for EsxA and FbsC from vaccinated BALB/c mouse, compared to normal mouse serum (NMS)

- EsxA demonstrated the ability to induce antibodies but only in the presence of an adjuvant.
- FbsC generated a significant immune response, both with and without the adjuvant.
- Immunisation with the Combo (FbsC + EsxA +Alum) did not improve the immune response.

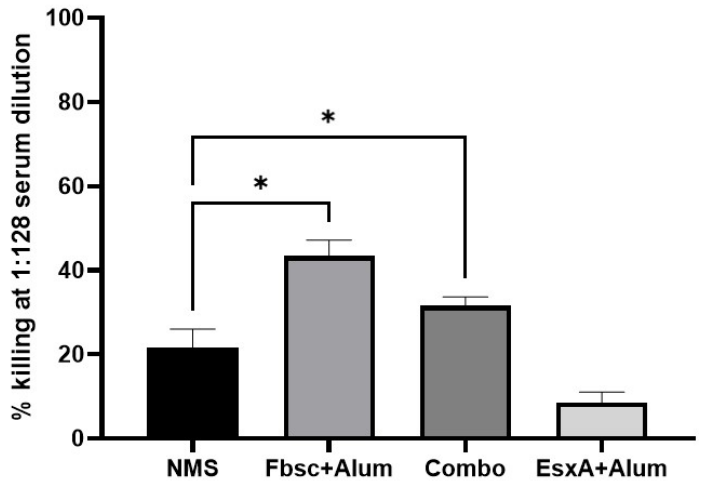


Fig 2: OPKA assay results demonstrating % killing of GBS ST III

- Immune serum from adjuvanted FbsC or combo immunised mice were able to mediate significant killing of GBS ST III in the OPKA compared to NMS.
- Immune serum from adjuvanted EsxA immunised mice did not show any killing probably due to secreted nature of the protein.

CONCLUSION & FUTURE WORK

- Ability of both EsxA (in presence of an adjuvant) and FbsC to stimulate the immune response has demonstrated the potential of these proteins as promising GBS vaccine candidates.
- Future investigations will focus on evaluating the opsonophagocytic ability of the induced response against other GBS serotypes. Including bacterial binding assays to test functionality of EsxA antibodies.
- Potential of these two proteins to be used as vaccine carriers for GBS polysaccharides will also be evaluated.