SEXUALLY TRANSMITTED INFECTIONS, HIV/AIDS

NEISSERIA GONORRHOEAE MTRE SURFACE EXPRESSED LOOP 2 FUSION PROTEIN SHOWED STRONG IMMUNOGENICITY IN VITRO

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Introduction: The human-specific bacterial pathogen Neisseria gonorrhoeae poses a threat for healthcare due to the rise in multidrug resistance. The development of an effective vaccine has remained elusive due to the antigenic and phase variability of surface expressed proteins.

Objective: To identify novel conserved surface proteins as vaccine candidates, an in silico approach was used to predict potential surface exposed antigens, which were subsequently analyzed for dendritic cells stimulation and T-helper (Th) cells polarization to evaluate their immunogenicity.

Materials and Methods: The Loop 2 was expressed in fusion protein with IMX315, which contains adjuvant activity. MtrE and Loop 2-IMX315 fusion protein were purified and used to stimulate mouse bone marrow derived dendritic cells. Mouse Bone marrow derived dendritic cells (BMDC) were stimulated followed by FACS analysis. Naïve T cells were isolated from mouse splenocytes and co-cultured with stimulated DC, and then the supernatants were collected for ELISA assay. Inhibitors of toll-like receptors were then used to investigate the activation pathway.

Results: MtrE was identified as one of the most conserved proteins. MtrE contains a 13-amino acid surface exposed loop (Loop 2) that could be exploited for vaccine development. The Loop 2 fusion protein increased CD80, CD86, and MHCII expression of DC, and the production of interferon-γ and TNFα by naïve T cells significantly. Inhibitor of TLR4 could block the activation of DC by Loop 2-IMX315 fusion protein.

Conclusions: Current study suggested Loop 2-IMX315 fusion protein activates DC remarkably via TLR4 signaling pathway and elicits strong Th1 polarization. The Loop 2-IMX315 fusion protein is a promising novel conserved antigen candidate for vaccine development against N. gonorrhoeae.