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# Immunogenicity of Extracellular Loop Hybrid Antigens of the Gonococcal Zinc Importers TdfJ and TdfH


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## Background

Neisseria gonorrhoeae (Ngo) afflicts over 80 million people annually and is the causative agent of the STI gonorrhea. Identification of suitable vaccine targets is challenging as Ngo alters expression and presentation

of many of its surface structures. The human host utilizes nutritional immunity, a process by which metal-binding proteins limit metal ion availability to pathogens. In response, outer-membrane TonB-dependent transporters (TdTs) on the surface of Ngo bind nutritional immunity proteins and strip them of their metals. TdTs, including TdfJ and TdfH, are well-conserved, on the bacterial surface, and play key roles in infection, making them promising vaccine targets.

Aim/Methods

To evaluate the potential efficacy of TdfH and TdfJ as vaccine candidates, we tested a series of extracellular loop epitopes fused to a lipoprotein scaffold. The fusion method alleviates difficulties in purifying and utilizing full-length integral membrane proteins by only including surface exposed TdfH and TdfJ epitopes. Hybrid antigens were formulated with alum and used to vaccinate mice. Serum and vaginal lavages were collected after each vaccine dose and serum, vaginal, and nasal lavages were collected at sacrifice.

Results

These samples were tested for ability to recognize the surface of Ngo as well as block binding of and/or utilization of human nutritional immunity proteins by gonococci. We identified an antigen specific antibody response in the sera samples against each of the hybrid antigens through whole cell ELISAs or dotblots. Further, a subset of sera samples contained antibodies able to block ligand binding and/or utilization.

Conclusions

These experiments aim to provide insight into a path forward for utilizing TdfH and TdfJ as vaccine antigens. Future studies will include testing the immunogenicity of the individual loop regions from the effective hybrids, as well as a combination TdfH and TdfJ hybrid. The hybrids that successfully blocked nutritional immunity protein binding or utilization will also be assessed for the generation of a protective immune response.