EPIC-STI PROJECT 2 (CHACKERIAN): Discovery and Refinement of Preventive STI Vaccines Targeting Critical Epitopes of Human Papillomaviruses and *Chlamydia trachomatis*

SUMMARY

Human Papillomavirus (HPV) and Chlamydia trachomatis (CT) are the two most common sexually transmitted infections (STIs) worldwide. HPV is the etiological agent of virtually all cases of cervical cancer and a large percentage of other cancers of the urogenital tract. Untreated CT infection of the genital tract can cause significant acute symptoms as well as longer term complications, including pelvic inflammatory disease (PID) and infertility. The goal of this project in the Epidemiology and Prevention Interdisciplinary Center (EPIC) for Sexually Transmitted Infections (EPIC-STI) is to develop effective broadly effective vaccines targeting these two important STIs.

We have developed a Virus-like Particle (VLP) based peptide display and affinity selection platform. This platform integrates the potent immunogenicity of VLP display with an affinity selection capability that allows the identification of vaccine candidates by two complementary methods. First, we can engineer the VLPs to display specific targets in a highly multivalent format that renders the target potently immunogenic. We have this approach to develop a second generation, broadly neutralizing HPV vaccine that is capable of blocking infection by all of the HPV types associated with cervical cancer, not just the two types targeted by the current vaccine. Second, we can use the VLP platform to identify vaccines from large libraries of potential vaccines by affinity selection using antibodies. In this project, we will use this approach to map epitopes targeted by the natural antibody response to CT infection, with the goal of identifying potential prophylactic CT vaccines. This project will draw heavily of biostatistics and bioinformatics facilities provided by Core B and will have significant synergy with Project 3 (Kong) and Project 1 (Starnbach).