Host/pathogen interactions

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Research Profile: Dr. Fowke has established an active research laboratory which is currently focusing on several major areas of research:

- Determining the immunological phenotype in individuals who are resistant to HIV infection. The lab hypothesizes that resistance is mediated by what the lab has termed Immune Quiescence, a phenotype resulting in few activated HIV target cells in the genital tract.
- How to induce this low immune activation phenotype by using anti-inflammatory drugs to reduce the number of HIV target cells in the genital tract.
- The lab studies antibody responses to respiratory viruses such as influenza and SARS-CoV-2.
- How HIV dysregulates the immune response and how immune checkpoints, such as LAG-3, may be suitable targets for intervention with the goal of re-stabilizing a fully functioning immune system among those infected with HIV.
- Determine the effects on the immune system of solvent use, which is common in economically deprived communities around the world, and its implications for infectious disease susceptibility.
Host/pathogen interactions

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Key Words: Mucosal immunology, HIV, HPV, gonorrhea, T cell immunology, inflammation, global health & cohort research, key populations, HIV prevention.

Antimicrobial resistance

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Key Words: Antimicrobial Resistance, bacteria, disinfectants/antiseptics, outer membrane vesicles, efflux pumps, multiomics analysis, whole genome sequencing, membrane biology.

Viral pathogenesis

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Research Profile: One if my lab's main research programs is focused on studying the biological functions of SARS-CoV-2 Spike protein during virus entry. Meanwhile, we are continuing to study the feasibility of developing vaccine approaches that can more broadly induce protection and more durable immunity against SARS-CoV-2/1 and MERS. The success of these projects will further open new avenues for the development of universal coronavirus vaccines against emerging or re-emerging SARS-CoV variants or strains.
Research Profile: Our lab studies how viruses (influenza, Zika, human coronaviruses, reoviruses) interact with cells. We focus primarily on understanding which cellular genes/proteins are required by these viruses for viral replication and how these genes/proteins affect viruses. In collaboration with some industrial partners, we also test various anti-viral strategies (i.e. ultraviolet irradiation) to attenuate these viruses.