

Immunoglobulin gene diversity in an African population and impact on antibody function in HIV infection



The Goal: to explore the diversity of antibody genes in an African population and the impact of this variability on immune responses to HIV infection, to enable development of more effective vaccines.

The Problem

Immunoglobulin genes, amongst the most variable genes in the human genome, encode antibodies which are critical components of our immune defense against pathogens. The diversity of immunoglobulin genes within African populations is understudied compared to other populations. Documenting this variation, and defining its impact on HIV infection and other viral infections such as SARS-CoV-2 and influenza will allow us to develop more effective vaccines and therapeutic antibodies.

Project Strategy

1. To characterize genetic diversity in the part of antibodies responsible for binding pathogens, the Fab, in a cohort of African women at high risk of HIV infection.
2. To characterize genetic diversity in the Fc regions of immunoglobulin genes, which are responsible for recruiting immune cells.
3. To examine the effects of genetic variation on the immune responses to viral infection (including HIV, SARS-CoV-2 and influenza).

Potential Impact

This project will document the high levels of genetic diversity in immunoglobulin genes in an African population compared to other global populations. It will also link novel genetic diversity to antibody function in HIV, SARS-CoV-2 and influenza infection. Understanding this will allow us to design more effective vaccines and therapeutics against these and other pathogens.

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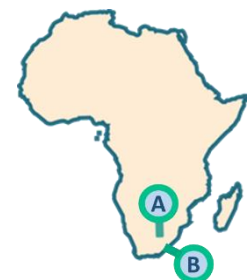


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Project Sites



South Africa
A: National Institute for Communicable Diseases/ National Health Laboratory Services, Johannesburg
B: CAPRISA, KwaZulu Natal

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This work is supported by the U.S. National Institutes of Health (NIH), Office of the Director (OD), the National Institute for Allergy and Infectious Diseases (NIAID), and the National Human Genome Research Institute (NHGRI) grant number U01AI136677.

