

Research Statement

Dr. Francis Ntumngia is a Research Assistant Professor in the Department of Global Health, College of Public Health, University of South Florida. Dr. Ntumngia's area of research is infectious disease with particular interest in malaria. Malaria is the world's most deadly parasitic infectious disease of humans. Every 30 seconds someone dies from malaria around the world, making it a leading cause of death and disease worldwide. Increasing cases of drug resistant parasites and the lack of a malaria vaccine is a call for concern. *Plasmodium vivax* is the most widely distributed human malaria parasite globally. Only persons that express the Duffy blood group antigen (Duffy Antigen Receptor for Chemokine, DARC) on their erythrocyte surface are infected with blood stage *P. vivax*. Recognition of this erythrocyte surface receptor and invasion is mediated by a parasite ligand known as the Duffy binding protein (DBP), making it viable target for vaccine development. My current research focuses on the functional analysis of this invasion ligand (DBP), and its value as a possible blood-stage vaccine for *Plasmodium vivax* malaria. A major obstacle for developing this molecule as an effective vaccine is that the polymorphic nature of its ligand domain, DBP region II (DBPII) and associated strain-specific immunity represent serious challenges that can compromise vaccine efficacy by rendering the normal immune response following infection ineffective against diverse strains of the parasite. The goal of the project is to overcome this obstacle and facilitate development of an anti-vivax malaria vaccine that is effective against diverse strains of the parasite.