Target Malaria: Uganda

Who we are?

Target Malaria is a not-for-profit research consortium working in Africa, Europe and North America that aims to co-develop and share genetic technologies to modify mosquitoes and reduce malaria transmission. The Uganda Virus Research Institute (UVRI) is the collaborating partner in Uganda.

Our work

Target Malaria's vision is to contribute to a world free of malaria. Our approach is malaria control by mosquito control. Our aim is to reduce the population of malaria mosquitoes to stop the transmission of the disease, using gene drive technology.

We are introducing our technology to stakeholders, including local communities, and regulatory agencies in a stepwise approach, working first with non gene drive strains, like our sterile male mosquitoes and our male bias mosquitoes, in preparation for our gene drive mosquito strains to come.

In Uganda, we are building upon the work conducted in Burkina Faso on the sterile male mosquito concluded in 2021, and in Ghana on ecological studies with the wild type mosquitoes. In parallel, our teams in the United Kingdom are developing in the lab self-sustaining gene drive mosquitoes, that have the potential to become new tools for vector control to fight malaria in Africa.

The male bias mosquito strain (scientific name is Paternal Male Bias Ag(PMB)1) is fertile and is genetically modified to produce mainly male offspring (approximately 95% in the laboratory). This mosquito does not carry the gene drive technology, upon mating only 50% of the offspring carry the transgene.

Context

Malaria is the leading cause of morbidity and mortality in Uganda and is endemic in approximately 95% of the country.

13.2 million malaria cases and **16,204** deaths in 2024.

(WHO estimates, World Malaria Report 2025)

Although pregnant women and children under 5 are mostly affected, over **90%** of Uganda's population is at risk of malaria[1].

1 Trends and Distribution of Malaria Deaths Among the General Population, Uganda, 2015-2019 - UNIPH

Our focus on the non gene drive genetically modified male bias mosquito

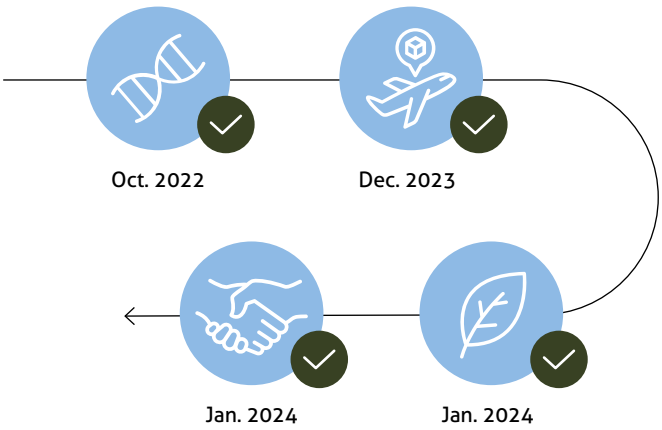
Regulatory permits and approvals

Under Ugandan legislation, to allow importation of genetically modified mosquitoes into our Arthropod Containment Level 2 (ACL-2) insectary on the UVRI campus in Entebbe, two authorizations were required:

- From the National Biosafety Committee, (NBC), who assessed our regulatory dossier submission in line with biosafety guidance;
- From the National Environment Management Authority (NEMA) who assessed the environmental impact of the proposed work to be conducted in the insectary.

Following reviews from both the NBC and NEMA, the Uganda National Council for Science and Technology (UNCST), the competent national regulatory authority, issued an authorization allowing Target Malaria to import the male bias mosquito into the ACL-2 insectary at UVRI and conduct contained use studies.

Regulatory timeline



- In October 2022, the Uganda Virus Research Institute received the approval from the National Biosafety Committee (NBC) to conduct contained use experiments on the male bias mosquito.
- In December 2023, an environmental and social impact assessment certificate from the National Environment Management Authority (NEMA) was also given under a separate process.
- In January, 2024, the Uganda Virus Research Institute (UVRI) obtained authorization from the Uganda National Council for Science and Technology (UNCST), the competent national authority for Biosafety, to import the male bias mosquito from our partner institution, the US Centers for Disease Control in Atlanta, into the ACL-2 insectary in Entebbe. This authorization does not include an environmental release study.
- In January 2024, stakeholders from communities in and around the UVRI campus gave their agreement for the program of work to be carried out in the containment insectary.

With all regulatory approvals in place, we successfully imported the male bias mosquito in May 2024. We are currently conducting studies in our ACL-2 insectary on the UVRI campus in Entebbe. This is an important step for Target Malaria, as it is the first importation and research on genetically modified mosquitoes in Uganda.

Studies objectives

- Train the team members to rear and study genetically modified mosquitoes;
- Prepare for the next phase of the project with the gene drive technology;
- Engage with the regulators and the stakeholders on the regulatory pathway to import non gene drive mosquitoes;

There is currently no planned environmental field release of the male bias mosquitoes in Uganda.

Angella Nakamaanya, Insectary Assistant, Betty Sewanyana, Member of the consultative group and Dr. Jonathan Kayondo, Principal Investigator.

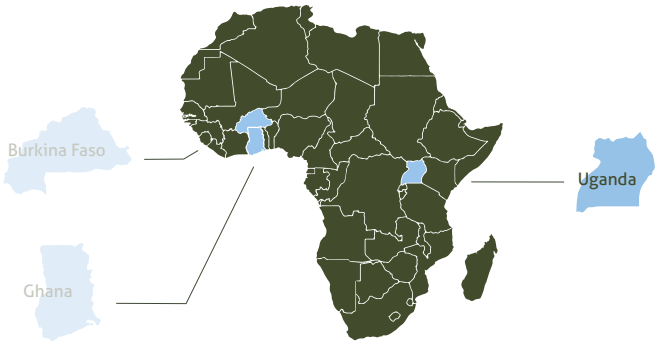
Where we work

Target Malaria currently works in three African countries:

- Uganda: Uganda Virus Research Institute (UVRI), Entebbe
- Burkina Faso: Institut de Recherche en Sciences de la Santé (IRSS), Bobo-Dioulasso
- Ghana: University of Ghana, Accra

We also work with researchers and institutions in the UK, US and Italy.

- USA: Centers for Disease Control and Prevention (CDC)
- United Kingdom: Imperial College London , University of Oxford and Liverpool School of Tropical Medicine
- Italy: Polo d'Innovazione di Genomica, Genetica e Biologia – PoloGGB



TARGET MALARIA Uganda
A Vector Control Research Alliance

THE REPUBLIC OF UGANDA MINISTRY OF HEALTH

Our activities in Uganda

Contained use studies

We are now conducting contained use studies in our ACL-2 insectary to:

- Confirm that the genetic modification and male bias phenotype is stably maintained in the ACL-2 facility, namely that it produces more male than female offspring. This has been demonstrated previously in other Target Malaria laboratories;
- Collect data on the development and life history of these mosquitoes to allow further characterisation.

Insectary & laboratory

The Uganda Virus Research Institute in Entebbe operates a specialized Arthropod Containment Level 2 (ACL2) insectary, inaugurated in July 2019. The biosafety level ACL-2 is necessary to rear and study genetically modified mosquitoes in containment.

We maintain a wild type colony of local mosquitoes in the insectary, as well as one strain of the genetically modified non gene drive male bias mosquitoes.

More activities in Uganda

Stakeholder Engagement

We continuously engage stakeholders at local, regional and national level in Uganda to inform, consult and also provide feedback on the different aspects of the project and the progress of our research. All steps of the project receive individual consent (where appropriate) or community agreement (in addition to regulatory approval) before they are implemented.

Following extensive engagement with the local communities, stakeholders from communities in and around the UVRI campus have also given their agreement for the research program to be carried out in the insectary.

Director of the Uganda Virus Research Institute, Prof Pontiano Kaleebu speaking at the commemoration of the World Mosquito Day 2023 in Entebbe.

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Read more on our website:

https://targetmalaria.org/about-us/where-we-operate/uganda/