

## Tanzania

### Bugando Medical Centre (BMC)

BMC is a 900-bed referral center in Mwanza. It is the main EMBLEM case-control enrollment site in northern Tanzania. The co-principal investigator is Dr. Nestory Masalu, Head-Oncology Department at BMC.

### Shirati

Shirati is the smaller site in North Mara. It houses an office, laboratory, and treatment unit for BL. The co-principal investigator is Dr. Esther Kawira, medical director of the Shirati Health, Education and Development (SHED) Foundation. The SHED Foundation provides administrative and logistical support for the EMBLEM study in Tanzania. SHED is a registered NGO with the Tanzanian government since January 2006.

### National Institute of Medical Research (NIMR)

NIMR provides ethical oversight for the EMBLEM study in Tanzania. The Mwanza campus provides long-term storage and assistance with shipping research samples.

## Kenya

### Homa Bay District Hospital

Homa Bay District Hospital is located in Homa Bay County, in Nyanza Province with a bed capacity of about 250 beds. It is the main EMBLEM case-control enrollment site in Kenya.

### Webuye District Hospital

Webuye District Hospital is located in Bungoma County, in Western Province with a bed capacity of 220 beds. It is the smaller case-control site in western Kenya.

### Moi University

Moi University Teaching and Referral Hospital (MTRH), established in 1990, is the second national referral

hospital in Eldoret, Kenya. The Research and Sponsored Project Office (RSPO) at Moi University provides administrative support for EMBLEM in Kenya. The Moi University Institutional Research Committee exercises ethical oversight for the study on behalf of the Kenya National Council of Science and Technology. The local co-principal investigator is Dr. Constance N. Tenge, in the School of Medicine.

### Kenya Medical Research Institute (KEMRI)

KEMRI is the national body responsible for carrying out health research in Kenya and will provide assistance with permanent storage and shipment of research samples for EMBLEM in Kenya. The KEMRI co-principal investigator is Dr. Peter Odada Sumba.

## Logistics and Support

### The African Field Epidemiology Network (AFENET)

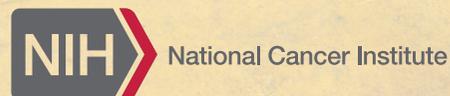
AFENET is a non-profit organization established in 2005 to support field and laboratory epidemiology training programs in Africa. AFENET is the main logistical support coordinating center for the EMBLEM study in Uganda, Kenya, and Tanzania with subcontracts with RSPO and SHED.

### Westat

Westat is a U.S.-based research and statistical survey organization that provides study management and logistical support to EMBLEM through a contract with NCI.

### Information Management Services, Inc. (IMS)

IMS provides data management and IT support including website and portal maintenance.



## Epidemiology of Burkitt Lymphoma in East-African Children and Minors



EMBLEM staff enrolling a study participant in Uganda



## Burkitt Lymphoma (BL)

*BL is the most common childhood tumor in Africa. Malaria, although both treatable and preventable, is the most widespread childhood infection. Understanding the role of malaria, Epstein-Barr virus, and genetics in Burkitt lymphoma will answer important scientific questions about the cause and biology of the disease. This information will be important for surveillance, diagnosis, clinical care, and prevention.*

(Left photo) EMBLEM patient (after treatment) and study staff.  
(Inset) EMBLEM patient before treatment.

## What is this study about?

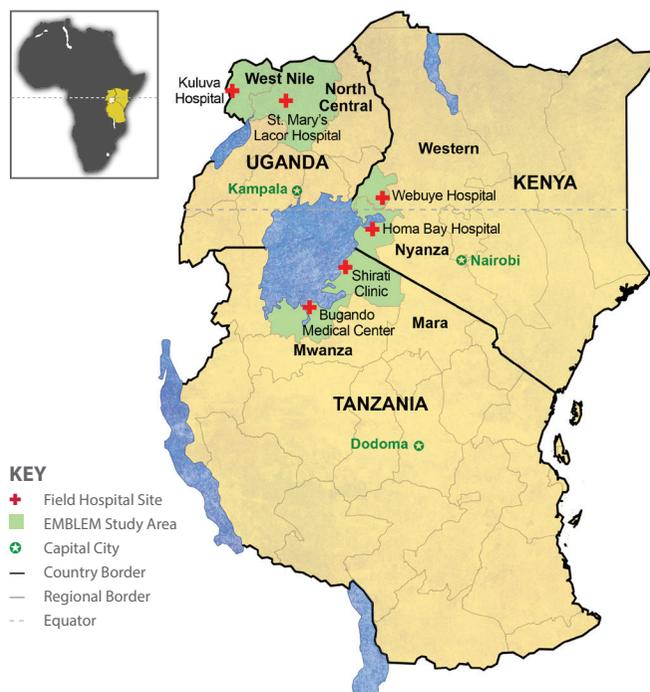
EMBLEM is a multi-country and multi-year case-control study of childhood Burkitt lymphoma (BL) sponsored by the National Institutes of Health/ National Cancer Institute (NIH/NCI). It is being conducted in rural areas of Northern Uganda, Northern Tanzania, and Western Kenya, where malaria endemicity is high all year-round.

### The study will:

- Enroll 1,500 histologically confirmed cases and two population-based controls (for a total of 3,000) per case, frequency matched on age and gender.
- Collect information about malaria exposures using questionnaires, blood samples, and saliva samples from both cases and controls.
- Collect frozen and formalin fixed tumor tissues from cases.
- Evaluate the role of the following in BL cases:
  - repeated malaria infections,
  - malaria genetic variants, and
  - Epstein-Barr virus (EBV) genetic variants.
- Collect data and maintain sample repository for novel studies of disease etiology and biology.
- Facilitate harmonization of BL care across all study sites, including case spotting, diagnosis, and treatment.

## Collaborations

- **NCI Office of Cancer Genomics:** BL tumor genome sequencing project
- **BioQuick Corporation:** Pathology tissue micro-processor project
- **NCI Center for Global Health:** Translation and capacity building
- **Partec (German):** Optimizing rapid malaria diagnostic tests for field studies



## FIELD SITES

### Uganda

#### St. Mary's Hospital Lacor

St. Mary's Hospital Lacor is a 480-bed non-profit charitable hospital located 6 km outside Gulu, the largest town in northern Uganda. It is the main EMBLEM case-control enrollment site in north-central Uganda. The local co-principal investigator is Dr. Martin D. Ogwang, Medical Director.

#### Kuluva Hospital

Kuluva Hospital, located 12 km from the town of Arua, is the smaller Uganda case-control enrollment site. It has a reputation of being the best Arua hospital with a long history of diagnosing and treating BL. The local co-principal investigator is Dr. Patrick Kerchan.

#### Uganda Virus Research Institute (UVRI)

UVRI, in Entebbe, was established in 1914 as the Yellow Fever Institute. It is a premier virology research center in Uganda. It serves as the long-term EMBLEM biospecimen storage/international shipment site. In addition, the UVRI-Science and Ethics Committee provides ethical oversight on behalf of the Uganda National Council for Science and Technology. The local co-principal investigator is Dr. Steven Reynolds.

#### Makerere University, Department of Medical Microbiology

Professor Moses Joloba and Mr. Samuel Kirimunda at Makerere University are the EMBLEM study monitors on behalf of the sponsor, NCI. They also provide technical laboratory support for EMBLEM.