



Burkitt Lymphoma (BL)

BL is the most common childhood cancer 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 BL 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 BL sponsored by the National Institutes of Health/National Cancer Institute (NIH/NCI) with study sites in rural areas of Northern Uganda, Northern Tanzania, and Western Kenya, where malaria endemicity is high year-round.

EMBLEM aims to:

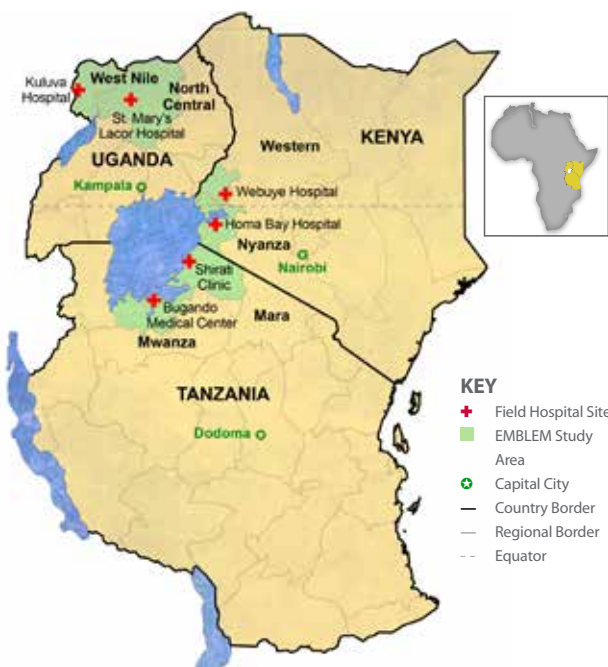
- Enroll 1,500 cases and 3,000 controls and
- Collect data about home and life experiences (including malaria exposures)
- Collect biological samples

EMBLEM will evaluate:

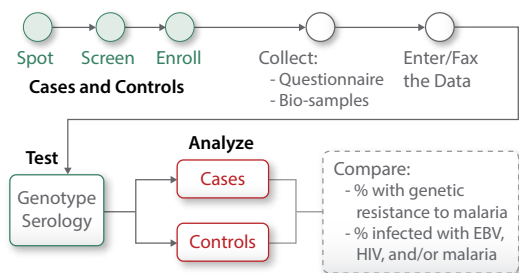
- Genetic risk factors of BL
- Role of infections in BL

EMBLEM is a model for:

- Conducting networked research
- Building capacity for high quality research in Africa
- Mentoring the next generation of African scientists
- Establishing collaborative projects



Work Flow



FIELD SITES

Uganda

St. Mary's Hospital Lacor



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



Kuluva Hospital



Hospital, located 12 km from the town of Arua, is the smaller Uganda 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 and 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 and provide technical laboratory support for EMBLEM.

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, located 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.

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. 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.





Status since 2010

Research Capacity

Technical training for:

- Health Researchers
 - Doctors
 - Laboratory technicians
 - Nurses
- Research Project Managers

Laboratory equipment

- Bio-safety cabinets
- Light and fluorescence microscopes
- Ultra-low temperature freezers
- QBC/Drucker hematology instruments
- Bench-top centrifuges
- Liquid nitrogen shippers and tanks
- Portable ultrasound units and core biopsy guns
- CO2 incubators
- Rotary microtomes

Transport

- Research vehicles

Research

- Ethical approval in 4 countries
- Established six active field sites
- Spotted over 1,600 cases
- Randomly selected 300 control villages
- Collected over 30,000 biological samples

Mentoring/leadership

- Principal investigator training
- Study standardization meetings (weekly calls, bi-annual conferences)
- EMBLEM scientific updates (Gulu, Uganda - 2010; Mwanza, Tanzania, 2012; Kisumu, Kenya, 2014)
- International scientific meetings participation
 - African Organisation for Research and Training in Cancer – 2011, 2013, 2015
 - International Lymphoma Epidemiology Consortium 2013

Collaboration

National Institutes of Health Partners

National Institute of Allergy and Infectious Diseases (ethics, logistics, magnesium studies)

Fogarty International Center (Principal investigator training)

Division of Cancer Control and Population Sciences (consortium support)

Center for Cancer Genomics (BL genome sequencing)

Center for Information Technology (ultrasound fixation assisted micro tissue processor)

Non-NIH Partner Projects

Ohio State University (BL diagnosis)

Partec/Sysmex (malaria diagnosis)

Fred Hutchinson Cancer Research Center (molecular staging of BL)



Epidemiology of Burkitt Lymphoma in East-African Children and Minors



EMBLEM staff enrolling a study participant in Uganda

