COVID-19+: Community Access Diagnostic Laboratory Networks

Africa Society for Laboratory Medicine (ASLM) | 6th Biennial Conference
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Rollout of a colorimetric RT-LAMP protocol for an efficient health emergency response
Promoted by the International Centre for Genetic Engineering and Biotechnology - ICGEB

Venue: Cape Town International Convention Centre
Date: Thursday, 14th December 2023
Time: 6.30 – 8.00 pm SAST

The SARS-CoV-2 pandemic highlighted the importance of timely and reliable local virus identification to effectively manage outbreaks and epidemics globally. In this context, the COVID-19+ and EXPANDIA projects aim to build comprehensive diagnostic and surveillance capacities in reference and community laboratories in sub-Saharan Africa for the management of SARS-CoV-2 and other (re-)emerging pathogens by transferring low-cost breakthrough technologies for rapid viral detection and genomic surveillance. To overcome the diagnostic challenges observed at the Point-of-Care (POC), the COVID-19+ consortium, recently performed a multi-centric clinical trial of an assay based on colorimetric reverse transcription loop-mediated isothermal amplification (RT-LAMP) in 10 African countries. The assay proved to be cost-effective, simple to use and could be efficiently deployed in resource-limited settings, providing comparable results to the RT-qPCR gold standard and thus it can be considered a valid diagnostic alternative for laboratories where RT-qPCR solutions may not be always viable.

Our preliminary study (https://doi.org/10.1016/j.eclinm.2021.101101) confirmed the robustness of the assay by running a multi-centric cross-sectional observational study of the diagnostic performance of colorimetric RT-LAMP on nasopharyngeal samples in Cameroon, Ethiopia, Kenya and Nigeria. The study was further expanded to Angola, Burkina Faso, Ethiopia, Ivory Coast, Senegal, Sudan and Zimbabwe on more than two thousand additional samples. In parallel, a similar study using direct saliva samples i.e. with no prior RNA extraction, was conducted in Cameroon, Ethiopia, Kenya and Nigeria on more than five hundred samples. Results of this latter study demonstrated a surprisingly good performance of RT-LAMP using a simplified protocol especially designed for resource-limited settings.

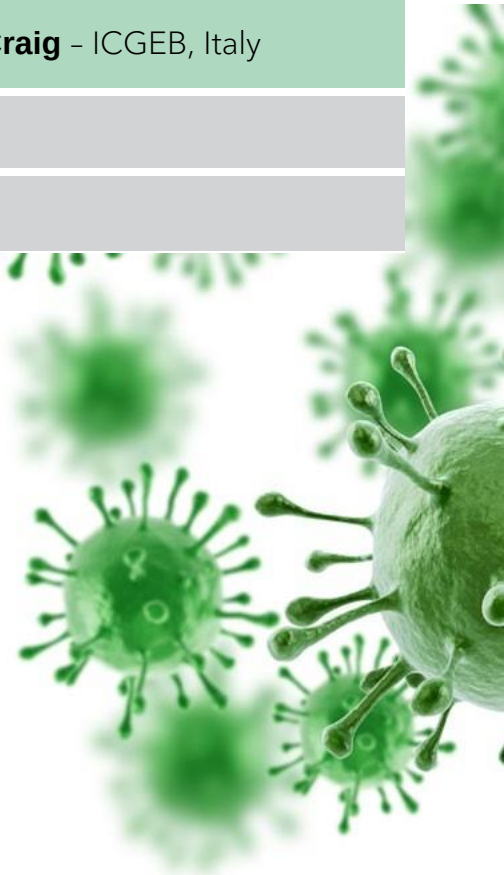
In our hands, the colorimetric RT-LAMP has proven to be a flexible assay that can be optimised and adapted for the detection of other pathogens of interest. The COVID-19+ and EXPANDIA projects are now focussing on the development of RT-LAMP for arbovirus diagnosis and have successfully concluded a first proof-of-concept of Zika RT-LAMP that can detect variants belonging to both Asian and African lineages.

The 1.5-hour long session will comprise presentations and discussions, bookended by opening and closing remarks.

Programme

Chair: **Prof. Maria Madalena Chimpolo** – LabGene, Angola

6:30 – 6:40	Opening remarks: The COVID-19+ and EXPANDIA initiatives	**Prof. Alessandro Marcello** – ICGEB, Italy
6:40 – 6:50	Introduction to RT-LAMP	**Dr. Eric Lelo** – KEMRI, Kenya
6:50 – 7:00	The pilot study results and rollout of the assay to additional 6 partner Countries inSub-Saharan Africa	**Dr. Molalegne Bitew** – BETin, Ethiopia
7:00 – 7:10	Optimization of the RT-LAMP protocol forsaliva	**Dr. Joseph Fokam** – CIRCB, Cameroon
7:10 – 7:20	Q&A session	
7:20 – 7:30	Outline of arbovirus and febrile diseases impact on Public Health in Sub-Saharan Africa	**Dr. Djibril Wade** – IRESSEF, Senegal
7:30 – 7:40	Development of RT-LAMP for Zika virus	**Dr. Tea Carletti** – ICGEB, Italy
7:40 – 7:50	The regulatory landscape for Lab Developed Tests (LDTs)	**Dr. Wendy Craig** – ICGEB, Italy
7:50 – 8:00	Q&A session	
	Buffet & Networking	



Participants and Speakers

Dr. Molalegne Bitew, BETin, Ethiopia

Dr. Bitew is the Director of the Health Biotechnology Research Directorate at the Bio and Emerging Technology Institute (BETin) of Ethiopia. He is Ph.D. with a Major in Molecular Virology and Minor in Immunology and Biotechnology. During the COVID-19 pandemic, he established a COVID-19 testing and research laboratory at the BETin which tested a total of 77,000 patients.

Dr. Tea Carletti, ICGEB, Italy

Dr. Carletti is Research Associate in the Molecular Virology lab at the International Centre for Genetic Engineering and Biotechnology (ICGEB) in Trieste, Italy. During her doctoral training, she contributed to several novel findings in the early events following the Flavivirus infection. As a Research Associate at ICGEB, she collaborated with other research laboratories, as well as industries, for the development of diagnostic tools with a focus on molecular assay for arbovirus infection diagnosis.

Prof. Maria Madalena Chimpolo, LabGene, Angola

Prof. Chimpolo is the Dean of the Medical School at Universidade Katyavala Bwila. She is an expert in genetics and is strongly involved in medical education and research ethics. Prof. Chimpolo obtained several advanced degrees from UNESCO, the University of Edinburgh and the University of Northumbria.

Dr. Wendy Craig, ICGEB, Italy

Dr. Craig is currently the Group Leader of the ICGEB's Regulatory Science Group which is principally involved in regulatory capacity enhancement in their Member States. She is actively managing projects targeting locally identified needs in biotechnology regulation and information dissemination, on the governmental, institutional, and individual levels. These activities rely on strengthening collaborations and creating synergies with international organisations and experts operating in similar or associated arenas. She regularly authors articles and reviews in the technical and scientific fields underpinning regulatory science.

Dr. Joseph Fokam, CIRCB, Cameroon

Dr. Fokam is a Senior Virologist/Lecturer and Head of Virology Laboratory at CIRCB (Chantal BIYA International Reference Centre) in Yaoundé, Cameroon. He is a lead virologist on COVID-19 and emerging pathogens and is a national representative at the WHO HIV testing guidelines development and HIV drug resistance working group.

Dr. Eric Lelo, KEMRI, Kenya

Dr. Eric Lelo is a Molecular biologist with vast experience in research for diagnostics for parasitic diseases. He has over 20 years of experience in research on schistosomiasis and soil transmitted diseases and works at the Kenya Medical Research Institute (KEMRI) as a Principle Research Scientist.

Mr. Kenneth Maeka, NMRL, Zimbabwe

Mr. Kenneth K. Maeka is the Head of the Genomics Unit at the National Microbiology Reference Laboratory (NMRL). Mr. Maeka is also the Technical Officer with Elizabeth Glaser Pediatric AIDS Foundation seconded to the Zimbabwe Ministry of Health and Child Care on a COVID-19 catalytic project.

Dr. Alessandro Marcello, ICGEB, Italy

Dr. Marcello is Head of the Molecular Virology Laboratory at the International Centre for Genetic Engineering and Biotechnology (ICGEB) based in Trieste, Italy. Essentially a virologist, trained in Italy and in the United Kingdom, Dr Marcello's research experience ranges from the investigation of the molecular basis of viral disease, to the study of the cellular response to viral infection, to the development of antiviral strategies and innovative diagnostic and surveillance tools in collaboration with industry and ICGEB Member States in low resource settings. Diagnosis and surveillance focus particularly on the development of point-of-care low-cost devices and full-genome sequencing pipelines. Currently he is the scientific coordinator of the COVID-19+ and EXPANDIA projects aimed at improving community access to diagnostics and surveillance in Africa.

Prof. Solange Kakou Ngazoa, Pasteur Institute de Cote d'Ivoire, Ivory Coast

Prof. Ngazoa is the head of Molecular Biology Platform and is the Laboratory Supervisor at the Technical and Technology Department at the Pasteur Institute in Abidjan in Ivory Coast.
Her areas of interest include microbiology, phagotherapy, environment and health.

Dr. Bamidele Soji Oderinde, University of Maiduguri, Nigeria

Dr. Oderinde is an Associate Professor of Medical Virology at the University of Maiduguri, Nigeria. He is also the Assistant Director of the WHO National Polio/ITD Laboratory at the University of Maiduguri Teaching Hospital and is actively involved in viral diagnostics, research, and development.

Dr. Zekiba Tarnagda, NIRL-IRSS, Burkina Faso

Dr. Tarnagda is specialized in veterinary medicine and virology and is the Director of the National Influenza Research Laboratory (NIRL) at the Institut de Recherche en Sciences de la Santé (IRSS) in Burkina Faso. It is in his lab that the first tests of SARS-CoV-2 have been analysed at the country level. Dr. Tarnagda is also the coordinator of the One Health initiative in Burkina Faso.

Dr. Djibril Wade, IRESSEF, Senegal

Dr. Wade is a Postdoctoral Researcher and Project Manager at the Institut de Recherche en Santé, de Surveillance Epidémiologique et de Formation (IRESSEF) in Dakar, Senegal. He obtained his PhD degree in Biomedical Sciences at the University of Antwerp (Belgium).
Dr. Wade aims to contribute improving the access to quality-assured diagnostics in resource-limited settings. He is the Project Manager of iLEAD, an African Innovation Network with the aim of accelerating the introduction of novel solutions for African and Global Health security. As a laboratory expert, Dr. Wade coordinates technical assistance around laboratory system strengthening.