

Our Science

A quarterly newsletter produced by the MRC Unit The Gambia focusing on our scientific research in health and highlights our achievements in Africa.

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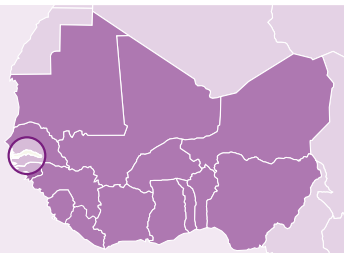
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Producing evidence base research to improve health in West Africa and beyond

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Our goal is to design and implement next-generation nutritional supplements

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Our Science, our new newsletter

It is with much joy and anticipation that we celebrate the launch of *Our Science*, a quarterly newsletter produced by the MRC Unit The Gambia. It focuses on the research we carry out, hence the title, and will bring to your attention our achievements. It is important that these are widely known and understood in light of their potential positive impact on public health.

I take this opportunity to thank our authors, editors and reviewers, all of whom contribute to the success of this newsletter. It is also exciting to announce, our increased engagement in West Africa, this newsletter will be produced in both English and French.

Our newsletter is organized by our focus areas, Disease Control and Elimination, Nutrition, Vaccine and Immunity, and Support Services. We have also chosen to profile individuals that have been exemplary to our organization and leaders in their field.

Finally, once you have read our newsletter, we encourage you to share your copy with others, to ensure that knowledge is continually transferred. We also welcome comments and suggestions, so please write to us.

Please enjoy reading the first issue of *Our Science*.

– *Professor Umberto D'Alessandro*

MRC Unit The Gambia launches’ 2016-2021 Quinquennial

The MRC Unit The Gambia (MRCG), is internationally-recognised for delivering excellent global health research. For almost 70 years, MRCG has tackled major infectious diseases of global public health importance in sub-Saharan Africa.

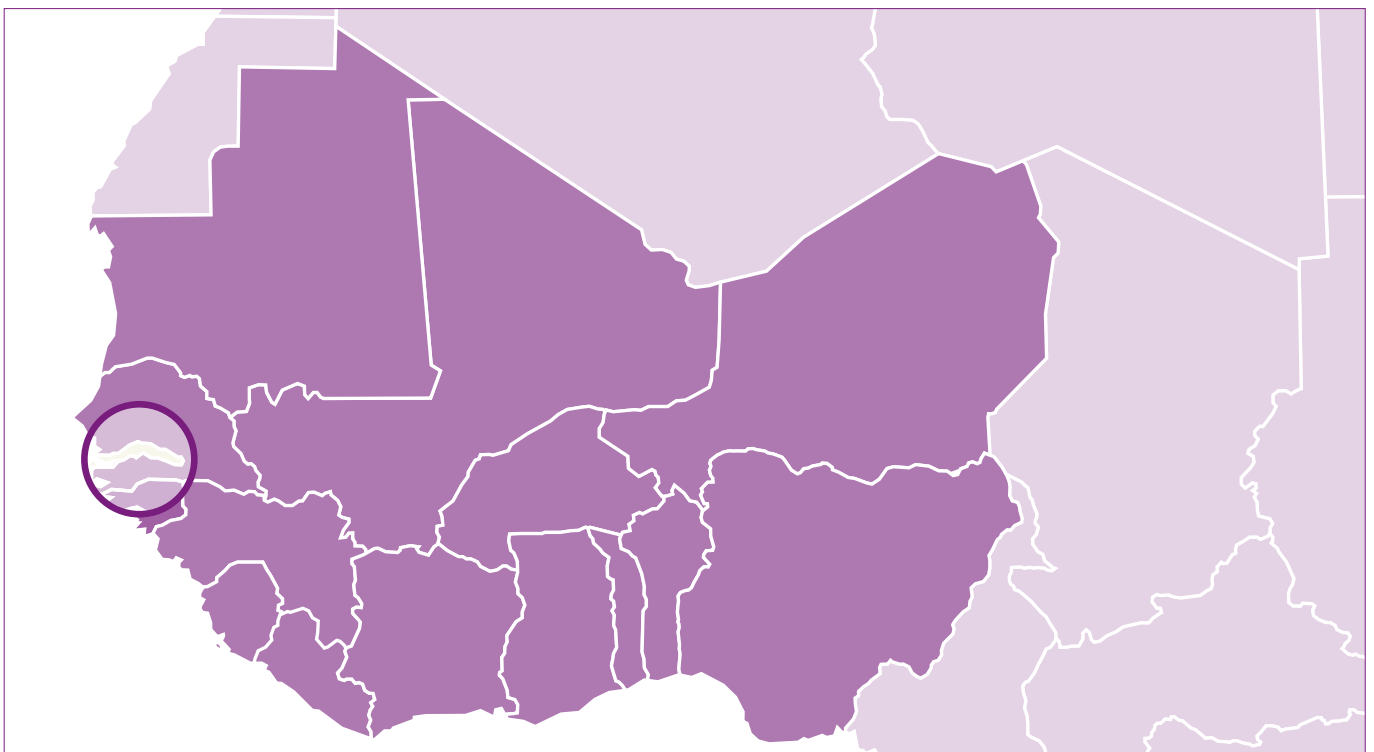
Its research outputs have informed the implementation of public health interventions that have had (and continue to have) a major impact on the health of the local populations, in The Gambia, in other West African countries, and beyond.

The MRCG’s investigator-led research is underpinned by the combination of excellent laboratory facilities, well defined

populations, excellent clinical services, rigorous ethical procedures and the ability to carry out high quality clinical trials, including large community-based studies. Its large research portfolio is structured into three Research Themes, namely Disease Control and Elimination (DCE), Nutrition (NUT), and Vaccine and Immunity (VI).

The DCE Theme’s scientific strategy aims at understanding the interactions between hosts, pathogens (and vectors when appropriate), the routes and mechanisms of transmission and the impact of interventions on infections and transmission, including large scale pre- and post-implementation surveillance of specific vaccines. The NUT Theme seeks to gain novel insights into the basic mechanisms linking malnutrition to metabolic and infectious diseases, with the ultimate goal to provide a stronger theoretical basis for effective

West Africa sub-region



community-based and clinical interventions in deprived populations worldwide. The VI Theme focuses on rational vaccine development, including safety, immunogenicity and efficacy, age-dependent mechanisms of protection, correlates of protection for the development of novel vaccines, and impact of vaccination strategies on pathogens by conducting immune-epidemiology, clinical trials and laboratory-based research.

The research platforms and the clinical cohorts represent the basis on which a large proportion of scientific research funded through competitive grants is conducted. They provide an important competitive advantage when submitting research grants, the opportunity to carry out preliminary, exploratory work and to host PhD and career development students.

Training and capacity building represents an important proportion of the MRCC's activities. Between 2010 and 2015, the

MRCC supported the training of 203 individuals, with MSc representing 24% and PhD 13% of the overall training. For the next quinquennial period, 2016-21, we will align our training strategy more closely to the MRCC's scientific programme.

MRCC's engagement in West Africa will increase by forming an alliance with sister institutions in the West African Region, with the aim of creating a new regional hub for health research and training.

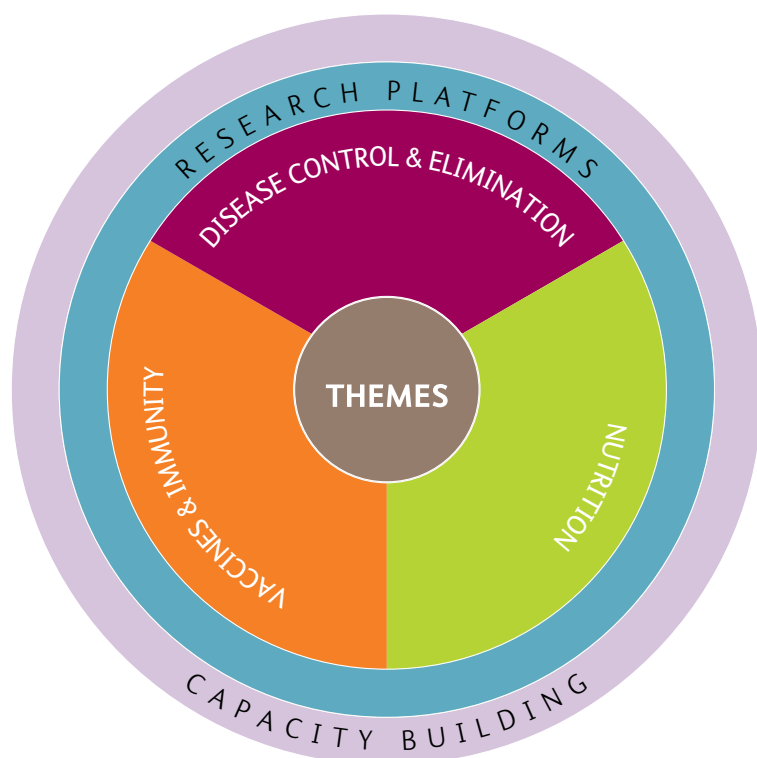
In the next 5 years, thanks to the excellent research services and laboratories, research platforms and the particularly enabling environment, the MRCC is well positioned to play an essential role in further advancing global health research and having a significantly positive impact on the health and well-being of the populations in sub-Saharan Africa.

Building on our achievements, for the next 5 years, the MRCC's scientific vision is to contribute to the post-2015 sustainable development agenda by producing evidence base research to improve health in West Africa and beyond.

More specifically:

1. Contribute to the control/ elimination of infectious diseases of public health importance in West Africa and sub-Saharan Africa;
2. Address the unacceptably high burden of maternal and neonatal mortality;
3. Design and implement next generation interventions against nutrition-related diseases through discovery science;
4. Strengthen research on non-communicable diseases, particularly on those associated with infections.

Our new research portfolio is structured into three Research Themes



A tool for interrupting Malaria Transmission

The PRINOGAM trial on the use of low doses of primaquine to interrupt malaria transmission from human to mosquitoes in individuals not sick but with a malaria infection has been successfully completed.

Malaria is a parasitic disease transmitted by Anopheles mosquitoes. The parasite is usually present as sexual and asexual forms in the blood stream. Though the sexual form does not cause disease, it's responsible for transmitting infection from the human host to the mosquito vector.

To find new tools to interrupt malaria transmission, the Disease Control and Elimination Theme of the MRC Unit The Gambia embarked on a clinical trial called Primaquine's gametocytocidal efficacy in

malaria asymptomatic carriers treated with dihydroartemisinin-piperazine in The Gambia (PRINOGAM). The trial is funded by the Global Health Trial Scheme (MRC/ DfID and Wellcome Trust) and led by Professor Umberto D'Alessandro Principal Investigator (PI) and coordinated by Dr Joseph Okebe. The trial was conducted first in Basse and Jahaly, and then in Basse only.

Interventions to reduce the transfer of parasite sexual forms, called gametocytes,

from man to mosquito may have a significant impact on malaria transmission and the overall burden of diseases. Previous research has shown that the only available treatment against gametocytes is primaquine that may cause anaemia in people with a deficiency of a specific enzyme, which is genetically determined. In these people, the risk of anaemia is related to the dose of primaquine given. The main objective of the trial was to determine the lowest possible dose of primaquine having similar activity against gametocytes than the recommended one and thus with a lower risk of anaemia.

The result findings provide the necessary data for the potential use of a lower than recommended dose of primaquine to eliminate gametocytes from malaria infected individuals, hence the potential for reducing transmission. The results of this study will be used to determine the feasibility of deploying primaquine on a large scale in sub-Saharan Africa, where the malaria burden is the highest, and may contribute to the drive towards malaria pre-elimination/elimination in this continent.

According to the PI Professor Umberto D'Alessandro, "further research is required to find out if the lowest efficacious dose is also safe in people at risk of anaemia. If yes, we could carry out a large, community-based trial to look at the impact on malaria transmission."

Study staff and participant during consenting



A new field-adapted molecular test for diagnosis of malaria infections

Dr Eniyou Cheryll Oriero is an early career Research Scientist with a keen interest in Molecular biology and Infectious disease research.

Eniyou obtained her first degree in Biochemistry at the Delta State University, Nigeria in 2001 and her Master degree in Biochemistry from the University of Ibadan, Nigeria in 2005. She worked on molecular characterisation and genetic transformation of food crops at the International Institute of Tropical Agriculture Nigeria, before switching to medical research.

Eniyou joined MRC Unit The Gambia in 2007, where she worked on several malaria diagnostics, molecular epidemiology and proteomics projects. She soon received an MRC funded PhD Training Fellowship in 2011, and in 2015 she was successfully awarded a Doctor of Philosophy in Medical Sciences at the University of Antwerp, Belgium. Eniyou's research field implementation and evaluation of novel isothermal, nucleic acid-based diagnostic tools for malaria elimination in sub-Saharan Africa focused on improving the sensitivity of malaria diagnosis in the field to identify asymptomatic carriers who usually have low parasite densities but can still maintain transmission to reduce the human reservoir of infection and consequently malaria transmission.

Eniyou successfully identified a novel target (the Apicoplast genome) with higher sensitivity than those currently used in molecular diagnosis of malaria, and optimized it with an isothermal amplification method known as loop mediated isothermal amplification (LAMP). The LAMP was tested first on archived samples and then was deployed in a field setting and compared with the currently recommended malaria diagnostic tools. Sensitivity and specificity of the new test were significantly better than standard methods and compared well with laboratory-based molecular tests. Eniyou is currently using the new test in a large malaria survey involving several thousands of people, in Farafenni, to show that it can be efficiently used in the field on a large number of samples.

Eniyou has four first author publications from her PhD project, published in reputable peer review journals and

has provided several oral and poster presentations at major international conferences. In recognition of the outstanding scientific outputs from her research, Eniyou was nominated for the 2014 American Society of Tropical Medicine and Hygiene (ASTMH) Young Investigator Award and Elsevier Clinical Research Award. Eniyou is an exceptional tutor and mentor to aspiring scientists within MRC Unit Gambia Unit.

Eniyou's supervisor Professor Umberto D'Alessandro remarked "I am extremely happy Eniyou obtained her PhD degree from Antwerp University; she is the first MRC Unit The Gambia's student I have supervised to have completed such training. Her work is extremely important for malaria elimination as she produced a new, field-adapted molecular test for the diagnosis of malaria infections."

Dr Eniyou Cheryll Oriero at her PhD defence with Supervisor Professor Umberto D'Alessandro



Epigenetic Mechanisms linking Pre-conceptional nutrition and Health Assessed in India and Sub-Saharan Africa



Midwife monitoring fetal heart

Deficiencies in essential vitamins and minerals (micronutrients) arising from poor quality diets are a major public health problem in low-and-middle-income countries (LMICs). In pregnant women they impair fetal development and cause childhood stunting and there is evidence that they also cause long-term problems in the offspring including poor brain and muscle development, increased body fat, and adult heart disease and diabetes.

The Nutrition Theme of MRC Unit The Gambia has found evidence that the nutritional environment experienced by a developing embryo around the time of conception may leave a lasting mark on the offspring's epigenome. This suggests that epigenetic mechanisms may in part underpin the observed long-term adverse health effects arising from suboptimal nutrition in early life.

To help further this research, in June 2015 the Nutrition Theme was awarded a substantial Newton Fund grant to study Epigenetic Mechanisms linking Pre-conceptional nutrition and Health Assessed in India and Sub-Saharan Africa (EMPHASIS). The Newton Fund grant was jointly awarded to MRC Unit The Gambia, the MRC Lifecourse Epidemiology Unit (LEU) at the University of Southampton and the Centre for Cellular and Molecular Biology (CCMB), Hyderabad, India.

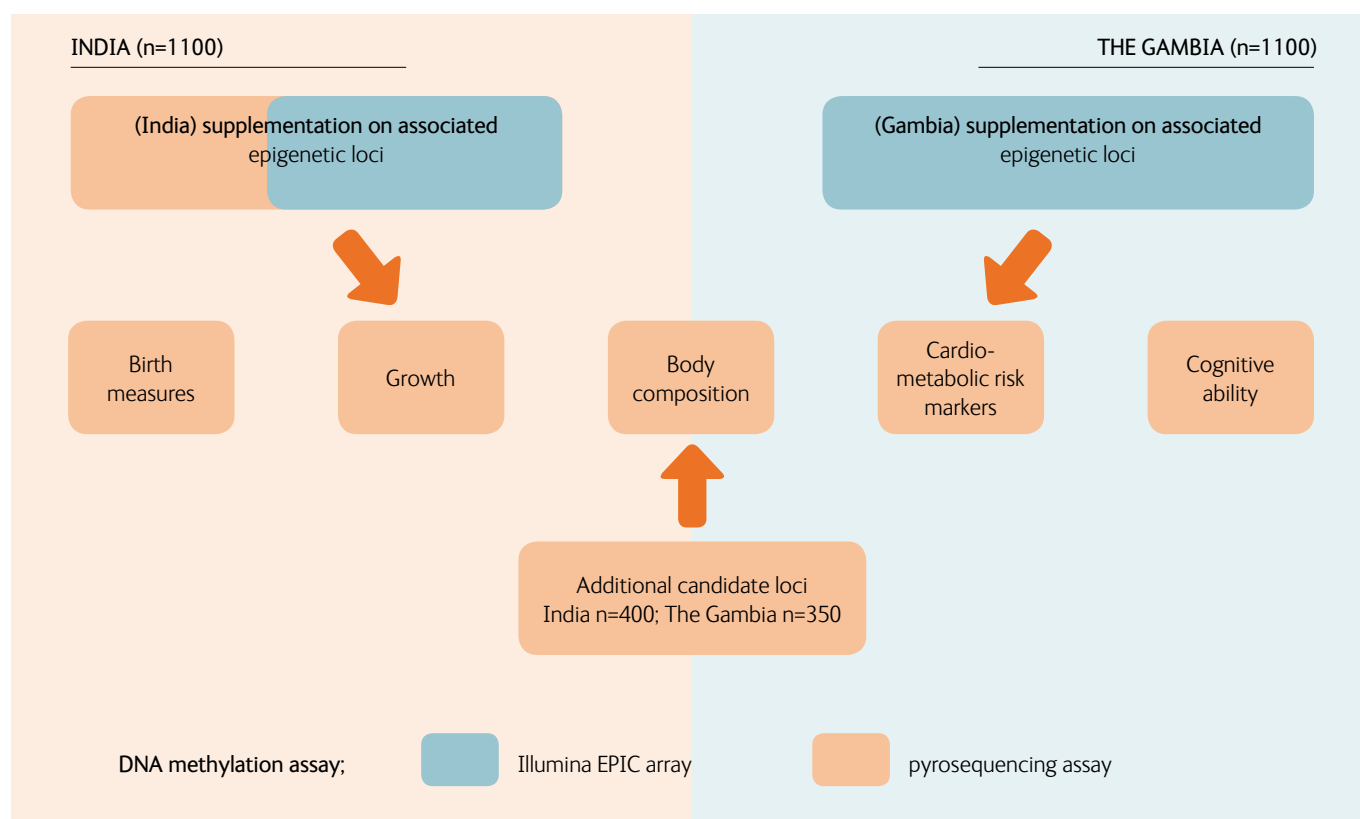
The joint initiative is led by Professor Caroline Fall from the MRC LEU in the UK, with Co-PIs Dr Giriraj Chandak from CCMB in India and Dr Matt Silver from MRC Unit The Gambia. The grant also includes funds to train a Gambian bioinformatician who will conduct the fieldwork and then study for an MSc in Bioinformatics in the UK. In a competitive process, Modupeh Betts was selected. Modupeh previously worked as a Scientific Officer in the molecular microbiology laboratory in Fajara.

The Gambian arm of the study benefits from MRC Unit The Gambia's ability to maintain and follow up long term birth cohorts in the West Kiang region. The 3-year Gambian study which is led by Dr Matt Silver will follow up children aged 8-9 years whose mothers took part in the West Kiang Peri-conceptional Multiple Micronutrient Supplementation Trial. Nutrition responsive epigenetic markers

will be correlated with a range of health-related outcomes, including changes in body composition, cardio-metabolic risk markers and cognitive function. A major strength of the study is the ability to compare findings across Indian and Gambian cohorts.

The collection of DNA from 350 Gambian children started in Jan 2016. Similar samples are currently being collected from a large intervention trial in Mumbai (n=1100) and the EMPHASIS team will analyse both cohorts in parallel to assess whether the interventions changed the epigenomes of the offspring and whether this predicts health and metabolic outcomes (see Figure 1). A second round of clinic visits for Gambian participants to assess their growth and cognition development will follow later this year.

According to Gambian lead investigator Dr Matt Silver, 'this is just one component of a heavy investment by the Nutrition Theme into understanding how a mother's diet prior to conception affects the epigenetic programming of health and development. Our ultimate goal is to design and implement next-generation nutritional supplements that will optimise the early development of the fetus, and hence provide life-long benefits.'



Analysis of associations between DNA methylation loci and phenotypic measures in India & The Gambia



Participants at the INMIS conference

Maternal and Neonatal Immunisation in The Gambia

Neonatal and early infant morbidity and mortality remains the highest in low and middle-income countries, often caused by infections that could be prevented by vaccines.

A critical window of susceptibility, however, remains in the first 3 months of life when the newborns have only received a very limited number of vaccines. Following the vaccines against polio, hepatitis and tuberculosis (TB) given at birth, the Expanded Programme on Immunisation (EPI) schedule only sets in at 2 months of life, and several doses of the same vaccine are needed to achieve full protection.

Immunizing mothers during pregnancy against vaccine-preventable infectious diseases, such as tetanus in Africa and pertussis and flu in other settings, is an attractive strategy to reduce the infant

mortality rate and has already been implemented successfully. The vaccines given in pregnancy induce antibody in the mother which then get transmitted to the baby through the placenta in the last trimester of pregnancy and safeguards the infant through passive protection. The strategy is already widely implemented to combat tetanus in newborns and has had an amazing impact worldwide. More vaccines can potentially be used in this manner, provided they are safe for mothers and babies.

In November 2015, the Vaccines and Immunity Theme (VIT) organized the 3rd International meeting for Neonatal and

Maternal and Immunisation (INMIS) in The Gambia, which attracted over 100 international visitors from 22 countries and relevant speakers addressing the different quantitative and qualitative aspects of the ongoing research and future perspectives (www.inmis.org/). Participants came from all stakeholder backgrounds: academia, public health, including WHO Afro, Bill & Melinda Gates Foundation, Programme for Appropriate Technology in Health (PATH) and industry.

As vaccination against tetanus is already implemented in Africa, and vaccines against flu and pertussis have been introduced in Europe, North America and Australia. The key areas for discussion included the development and utilization of vaccines for pathogens that affect maternal and child health, such as pertussis, influenza, group B streptococcus, respiratory syncytial virus, meningococcus and pneumococcus. Lessons learnt from these clinical trials and implementation programs can now shape the roadmap

for research and practice and ultimately influence policy for these interventions at the WHO level.

To assess the safety and immunogenicity of vaccines given at pregnancy in The Gambia the VIT Theme secured funding from the Global Health Trials scheme, the European Union (EU) and the Meningitis Research Foundation for 3 clinical trials to be conducted at the MRC Unit The Gambia. During the next Quinquennial 2016-2021, the VIT will conduct a portfolio of studies to see if vaccines given to pregnant women against pneumococci, *Bordetella pertussis* and meningococcus A can be shown to induce protection in babies. We will carefully monitor safety and measure immune responses in mothers and babies to also clarify if vaccines given in pregnancy have a knock-on effect on the immunity induced in the offsprings, once they receive their own vaccinations.

For these trials, which are sponsored by the MRC, participants will be recruited at our established community sites and be carefully followed during pregnancy, including the use of our new ultrasound facility to accurately date the pregnancies. Following extensive community sensitization, the trials are implemented by our experienced teams in the field, lab and data management, and are led by Dr Ed Clarke, Head of Infant Immunology and Professor Beate Kampmann, Theme Leader for VIT. The trials will provide many opportunities for us to conduct novel laboratory-based science, which will explore detailed responses to the vaccines using systems vaccinology approaches, along with conventional read-outs of vaccine responses. They will also provide us with an opportunity for qualitative research into the acceptance of vaccines in pregnancy, which is an important complimentary part in this new and exciting field. There will be a number of training opportunities associated with the studies. Careful safety oversight is in place.

New ultrasound facility



MRCG's Routine Diagnostic Laboratories Attains ISO 15189:2012

A key event for the Laboratory Services Department was the attainment of ISO 15189:2012 accreditation for the Routine Diagnostic Laboratories comprising the Clinical, Serology and Tuberculosis (TB) Diagnostics Laboratories.

ISO 15189 is the pre-eminent standard that specifies requirements for quality and competence of Medical Laboratories. Initial accreditation was awarded in July 2015 by the Kenya Accreditation Service (KENAS), which has been sustained through a surveillance visit in January 2016.

Accreditation is proof that our facility, personnel and processes are able to consistently produce quality, reliable and timely test results, which is crucial to patient care, clinical trials and scientific

research. International recognition of the quality of our laboratory work enhances MRCG's reputation for excellence in scientific research and should impact positively on our success rate in attracting research funding and prestigious collaborations.

Staff members of the Clinical, Serology, TB Diagnostics Laboratories and the Quality Department played a pivotal role in driving the process. The support services involved were Biomedical Engineering,

Procurement, Logistics, Facilities, Data Management and IT Departments.

The current accreditation will need to be maintained through periodic scheduled re-evaluations. There will be more tests, especially in molecular diagnostics and research, included in the future accreditation scope.

This accomplishment would have not been possible without the exceptional team work shown by MRC Unit The Gambia staff involved in the accreditation process and the strong support by the MRCG Leadership.

Bola Lawal (Clinical Laboratories Manager), Tisbeh Fye-Joof (Serology Lab Manager) Dr Ousman Secka (TB diagnostics laboratories) and Dr Davis Nwakanma (Head of Laboratory Management)



MRC Africa Backup Project – Research Data Protection

MRC Unit The Gambia's Information Technology (IT) Team played an important role as part of a joint collaboration with Medical Research Council (MRC) Harwell and MRC Uganda in the MRC Africa Backup Project.

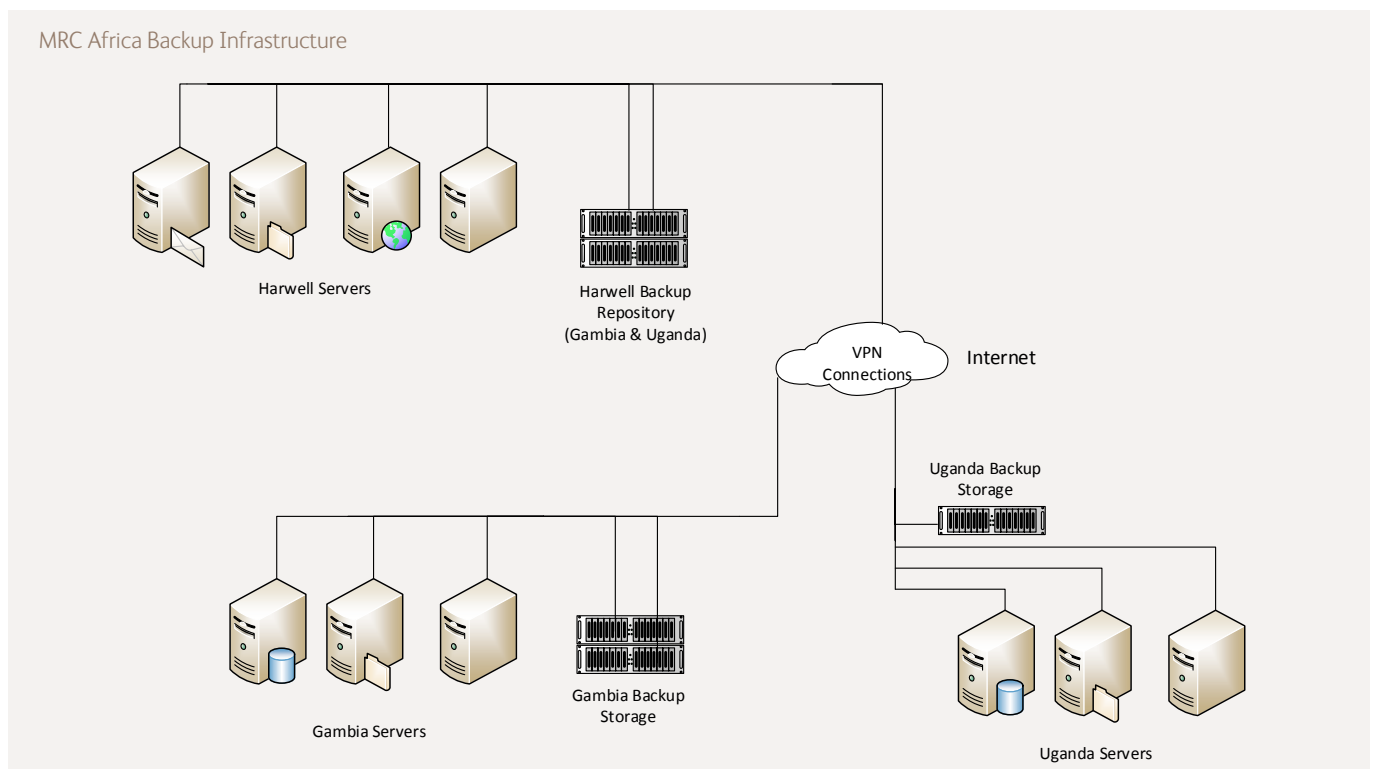
The MRC Africa Backup Project was a capital award undertaken in November 2014 in response to increased requirements from funding bodies. The aim of the project is to ensure research data is both secured, protected and available, as research data is becoming increasingly more valued by the community.

Within MRC Unit The Gambia, the Head of IT, Badou Gaye and his team, Alie Jallow (Server Manager), Joseph Osatuyi (Network Manager), carried out the installation of the protection infrastructure and created a Virtual Private Network (VPN) between MRCG Fajara and MRC Harwell. The move is to ensure the replication of all MRC Unit The Gambia research data to MRC Harwell repositories on a daily basis.

There were some technical challenges earlier on with the replication of the data due to bandwidth constraints. However, this was later mitigated with the use of data compression, de-duplication and optimization of the network in a joint effort with the MRC Harwell team.

This project became fully operational in October 2015 and has significantly improved the recovery time and recovery point objective of the MRC Unit The Gambia's research, by safeguarding application and research data on-site, at MRC Uganda and MRC Harwell.

This infrastructure provided enterprise-class backup products and data appliances which protects the intellectual property of the MRC Unit The Gambia, reduces backup windows, improved reliability of the backups, reduce overheads through better management and automation which helped the MRC Unit The Gambia to achieve the data storage objectives of the funding bodies.



Head of Information Technology

Badou M Gaye

Badou Gaye, the Head of Information Technology is a Gambian who plays a pivotal leadership role in strengthening the quality of IT management systems and improve coordination of IT related activities across the MRCG and Medical Research Council UK.



Badou M Gaye

His professional background is in IT Systems Administration, Information Security and he completed his first degree at Fourah Bay College, University of Sierra Leone. Currently, Badou is undertaking his dissertation in MSc. Information Systems. Badou is a Certified Microsoft System Engineer, Information Security Analyst and a Virtualisation enthusiast which has given him a vast amount of experience in managing complex IT infrastructures.

Badou was employed as the Head of IT in 2013 and over the years, Badou has provided high quality IT/IS services (data and voice) in support of research and administrative functions at the MRCG. Working with the Director of Operations, Badou has successfully aligned the IT strategy of the MRCG towards providing excellent scientific research to establish more effective cross cover of specialized expertise and drive improvements in operational efficiency. In his capacity as the Head of IT, Badou has persistently defined cases for future IT requirements, built around business re-engineering addressing the technical and financial implications for change.

Badou has a track record for delivering remarkable Information Communication

Technology services, managing a unique and complex computing environment consisting of Windows, Linux, Macs to support world class scientific research. This complex infrastructure includes a Wide-Area-Network spanning from MRCG Stations of Keneba, Basse and Fajara. Badou effectively manages, a large scale storage sub-system, with high-performance computing for scientific applications like Bioinformatics, virtualisation technologies and other cutting-edge scientific equipment.

As MRCG operations is highly dependent on computers. Over the last few years, MRCG has seen the number of computers, local area network and storage capacity substantially increased. This expansion has increased the number of users and the range of software used by MRCG. While based at the main station in Fajara, the Computer Centre also supports computer facilities at the upcountry Field Stations in Keneba and Basse.

Under his leadership, Badou's department provides an effective, efficient and economic operational IT service to support the entire research infrastructure of MRC Unit The Gambia.

Post-doctoral Clinician Scientist

Dr Toyin Togun

Dr Toyin Togun is a post-doctoral clinician scientist with a strong interest in implementation research focused on the discovery and practical application of novel immunological tools to improve the diagnosis and management of tuberculosis (TB) in children.



Dr Toyin Togun

His professional background is in clinical medicine and he completed a Master of Science degree in Public Health in Developing Countries at the London School of Hygiene & Tropical Medicine as a winner of a highly competitive World Bank Postgraduate Scholarship.

In April 2012, Toyin was awarded MRC-funded Clinical Research PhD Training Fellowship in Life and Biomolecular Sciences, with The Open University,

Milton Keynes, United Kingdom. His PhD research was an immuno-epidemiological project in childhood TB that centred on the interface between clinical assessment, diagnostic algorithms, advanced diagnostic biomarkers and the challenges of translating these insights from discovery to practice and policy in the field. Toyin successfully defended his PhD thesis in October 2015, within less than the four years stipulated for completion of the PhD fellowship.

Among the scientific outputs from his PhD research are the discovery of a novel multicytokine biosignature for diagnosis of childhood TB, four first-author publications including two book chapters, and several presentations at major international conferences. Within the course of his PhD training, Toyin also successfully completed a research leadership development programme jointly organised by the MRCCG and Vitae (UK), served on the MRCCG Higher Degrees Committee and facilitated the establishment of the MRC Unit The Gambia's Academic Journal Club for early career scientists.

In a further recognition of the outstanding scientific outputs from his PhD research and his inspirational leadership potentials, Dr Toyin Togun recently won the prestigious 'MRC Gambia Director's Award for Research Leader of Tomorrow' in December 2015.

According to Professor Beate Kampmann, leader of the Vaccines and Immunity Theme at MRC Unit The Gambia, 'Toyin is the first PhD student to complete his PhD under my supervision since I joined the MRC Unit The Gambia in 2010. He has shown what it takes to get ahead in my Theme and has been an inspiration and role model for others. He is extremely hard working'.

Head of the Research Support Office Dembo Kanteh

Dembo Kanteh the first Head of the Research Support Office (RSO) plays a pivotal leadership role in managing, identifying and developing strategies to optimize the grants administration process of MRC Unit The Gambia.



Dembo Kanteh

Dembo currently serves in the Executive of the West Africa Research Management Association as Assistant Secretary General of West African Research and Innovation Management Association (WARIMA). Dembo's key role at WARIMA is to increase MRCG's visibility for research management through the publication of MRCG's science research.

Dembo obtained his first Degree BA (Hons) Economics from Delhi University in India in 1996. He started work in MRCG

in June 1999 as a Trainee Administrative Manager. MRC Unit The Gambia sponsored his management training through the Open University, where he obtained his MBA. Dembo held a steady stream of responsibilities in MRCG working as an Administrator in the Field Stations, in Research Programmes, as Grants Manager and more recently as Head of the Research Support Office.

As MRCG depends on competitive funding for all of its research, Dembo

effectively oversees the preparation, timely submission of grant applications, contracting, and management of grants. He successfully monitors interventions and programs funded by grants to ensure compliance with grantor guidelines. With his exceptional track record for achieving grant targets, Dembo also provides support to our sister sites across Africa. Under his leadership, the RSO over the years has become a centre of reference for collaborative research sites in Africa for learning and training.

Dembo and his team successfully embedded the performance reporting system at MRCG, which includes the quarterly Grants and Publications Report used both for performance review and decision-making Unit-wide and at the Leadership level. The team also collects information on performance for MRCG which forms the basis of the MRCG Performance Report. Within the Operational Department, Dembo's team provides a view of work demands of projects for relevant planning to ensure grants are implemented according to the operational and financial needs of the MRCG.

Based on his background Dembo says "I have a strong fervour for the development and training of others. I have mentored and developed several management trainees who have either completed or about to complete their MBA studies. Together with them, we run a management lab group within MRCG, looking at relevant problems and proposing solutions for management."

Microbiology Laboratory Manager and Head of Tuberculosis diagnostics

Dr Ousman Secka

Dr Ousman Secka is the Microbiology Laboratory Manager and Head of Tuberculosis (TB) diagnostics of MRCG. In addition, Ousman functions as The Unit Microbiologist and Biological Safety Officer.



Dr Ousman Secka

Ousman continues to contribute to the success of the laboratories, by bringing his wealth of experience and institutional memory to the task of maintaining an efficient Laboratory Services Platform.

Having spent over 30 years in service, Ousman is a long-standing staff member of the MRCG, who has undertaken various training, sponsored by the MRCG. He joined the MRCG straight from high school as Trainee Laboratory Technician in 1983. His career progression is one of the success stories of MRCG's strategy of identifying, training and retaining indigenous talent to occupy key roles that support the continuity of research. He obtained an MPhil degree in 1999 and a PhD in 2013 while contributing in several different roles to MRCG's research agenda.

Ousman was the first to characterise *Helicobacter pylori* of clinical isolates from The Gambia in detail and more importantly, the first to characterise isolates taken from young children close to the time of their first colonisation. The combination of phylogenetic analyses, antibiotic susceptibility, clinical correlation and geographical association within a defined human population has been unique as it is the only study so far which includes The Gambia.

Ousman worked extensively on identifying the characteristics of both invasive and carriage isolates of *Haemophilus influenzae* type b from The Gambia. His work led to the first description of a hyperinvasive *Haemophilus influenzae* type b genotype in The Gambia, which was presented at Heriot-Watt University, Edinburgh at the 156th Society for General Microbiology (SGM) meeting in 2005. Ousman also developed and evaluated a rapid and simple biotyping method for *Haemophilus influenzae* which he called "MICROTEK" published in *Br J Biomed Sci.* 1998.

Prior to his current position, Ousman successfully led the Research Laboratory Administrative Platform and Biobank, in setting up systems to comply with Good Clinical Laboratory Practices (GCLP). Ousman led the laboratory refurbishments of Thompson block in 2011 and Biosafety level 3 laboratory in 2013. He successfully led the TB Diagnostic Laboratory to achieve ISO 15189 accreditation and maintaining GCLP in 2015.

According to Dr Davis Nwakanma, Head of Laboratory Management, "Dr Ousman Secka's dedication to duty is exemplary and the ability to bring tasks to completion within strict timelines and in a high standard makes him an outstanding member of the Laboratory Management Team."

Trainee Bioinformatician Modupeh Betts

Modupeh Betts is a Trainee Bioinformatician within the Nutrition Theme of MRCG. Modupeh has been recently awarded an exciting fellowship with the Nutrition Theme as a Trainee Bioinformatician within the Epigenetic Mechanisms linking Pre-conceptional nutrition and Health Assessed in India and Sub-Saharan Africa (EMPHASIS) grant.

EMPHASIS is focused on investigating whether the micronutrients received by mothers before conception has influenced the epigenome and/or health of their now 8-9 year old children. Changes in epigenetic signatures, such as DNA methylation, between intervention and control groups will be correlated with health outcomes.

Modupeh is currently involved in data collection at Keneba Field Station and will be undertaking a full-time MSc Bioinformatics in the UK in the fall, 2016. He will be line managed by EMPHASIS project PI, Dr Matt Silver, who is also a Bioinformatician and Statistical Geneticist. Modupeh has had a long term interest in bioinformatics and the fellowship presents a unique opportunity to develop his bioinformatics expertise and work with leading scientists in discovery research. Modupeh travelled to India in February 2016 to attend the first annual EMPHASIS meeting.

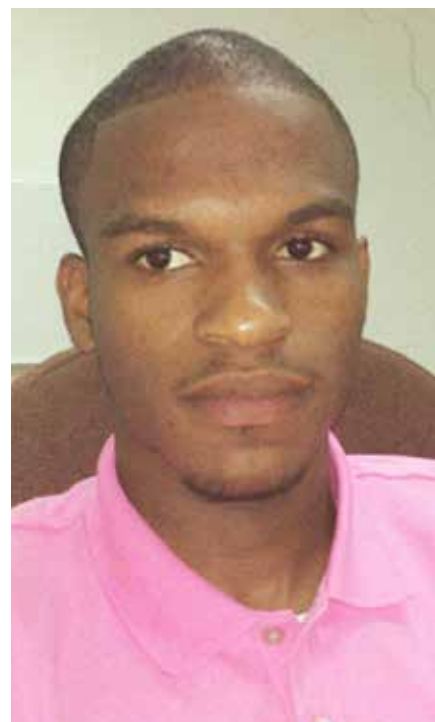
Modupeh joined MRCG as a Laboratory Technician in Dr Martin Antonio's Molecular Microbiology Group in December 2006. Modupeh graduated with distinction in the MRCG sponsored 4-year

Foundation Degree in Biomedical Science in July 2012. He subsequently earned a scholarship from MRCG to complete BSc Biomedical Science full-time at Kingston University, London where he graduated with first class honours in 2013. Modupeh successfully returned to Dr Antonio's group as a Scientific Officer under the supervision of Dr Brenda Kwambana-Adams.

Modupeh's career progression is one of the success stories of MRCG's strategy of identifying, training and retaining indigenous talent to support the continuity of research. The numerous technical training opportunities and skills Modupeh acquired over the years within the molecular sciences group have had a significant impact on the recently concluded 3-year Global Enteric Multicentre study (GEMS) and the 2-year Vaccination and Paediatric Microbiome Project (VPM).

Modupeh received training in South Africa in 2010 which led to the publication of the first data on circulating pre-vaccination rotavirus genotypes in The Gambia in 2013. He attended the Wellcome Trust Advance Course on 'Pathogen Genomics'

in 2014 in Malawi and also had six weeks training in January 2015 at the Sir William Dunn School of Pathology, University of Oxford, UK. He has most recently been involved in a milestone achievement of preparing 16S metagenomics libraries for Next Generation Sequencing (NGS) in-house at the MRCG.



Modupeh Betts

Leading health research in West Africa to save lives and improve health across the world

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We are keen to receive feedback and suggestions for new features from our readers, if you have any comments, please let us know.

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