AND THE JOURNEY TOWARDS
MORE SCIENCE IN AFRICA
Dr. Charles Agoti, an IDeAL post doc fellow engages the Wellcome Trust Governors led by Eliza Manningham-Buller, Chair of the Wellcome Board during a lab tour at the KEMRI Wellcome trust programme in Kilifi.
Our vision is toward African-led research solving African health challenges. Realising this vision is challenging however, reflecting on the 2019 achievements we are on track and highly optimistic that we will fulfill this vision.

We remain committed to our mission of developing a critical mass of African research leaders by attracting, training and retaining the best Africans in research. 6 PhD students, all graduating with only minor corrections to their theses, is a cause for celebration, as is the completion of 19 Masters and 25 Postgraduate Diploma training, 14 undergraduate and 9 School Leavers attachments.

But an even greater reason to celebrate is the excess of 3 million dollars in grants, fellowships and studentships that our trainees won. Thus, enabling them to progress to the next level of the research career ladder and guaranteeing the sustainability of the capacity we are building.

Our interest goes beyond numbers; we are keen that the quality of our training be reflected in the impact of the research our fellows undertake.

Beyond generating knowledge, we are strong advocates for the translation of research into policy and practice. In 2019, IDeAL fellows and researchers were engaged in more than 20 advisory panels and processes related to diverse health policy activities including universal health coverage and vaccines rollout in Kenya, gender mainstreaming in health and mapping health care access across Africa.

As we look to enhance our training capacity we are working closely with local universities to develop new high-quality post-graduate programmes. Last year we launched a new PhD in Health Care Management in partnership with Strathmore University, and funding from DAAD and initiated a new partnership with Daystar University to offer science communication projects for students pursuing Masters degree in Communication.

As a department, we feel that 2019 was a success, and for this, we are beholden to all the researchers and partners who committed a significant amount of their time and energy providing training, supervision and mentorship to our fellows.

We appreciate the strong support we received from the KEMRI-Wellcome Trust Research Programme operations teams that enabled us manage a large portfolio of activities despite having a relatively small secretariat.

Finally, we express our gratitude to our funders – the Wellcome Trust and DFID for their continued support to the DELTAS scheme through the African Academy of Sciences. We hope that going forward, we will continue attracting resources and support to sustain the momentum we have built and to expand our footprint on the African health research landscape.

6 PhD students, all graduating with only minor corrections to their theses, is a cause for celebration, as is the completion of 19 Masters and 25 Postgraduate Diploma training, 14 undergraduate and 9 School Leavers attachments.”
The 2019/20 IDeAL masters and postgraduate students benefitted from various IDeAL departmental short courses.

The courses were offered as part of the induction of the new students seeking to increase understanding in scientific writing, research and statistics.

The training kicked off with Introduction to Statistics, followed by a one week Scientific Writing course and ended with Introduction to Research course. The courses attracted facilitators from across different disciplines and a total of forty students participated.

Training Workshop for PhD Students

IDeAL PhD students participated in a two-day training workshop in Watamu, Kenya in February 2019.

The two-day workshop was attended by various mentors who had one-on-one meetings with respective students. Students participated in short training courses covering topics such as grant writing, personal and career development, time management, and writing skills.

Health Systems Short Course

IDeAL supported the 2019 and fourth edition of the Health Systems Course. The Course has been running since 2016.

Last year’s edition was held at Pwani University running from the 22nd July to 26th July and attracted 28 participants drawn from different organisations. The course aims to demonstrate an understanding of the dynamic and complex nature of health systems.

The Pwani University Deputy VC, Prof. Helen Mondoh graced the closing and certificate award ceremony. Plans are underway for the fifth 2020 edition.

Annual Bioinformatics Course held in Kilifi

The Eastern Africa Network for Bioinformatics Training (EANBIT) was held at the KEMRI-Wellcome Trust Programme in Kilifi from 1st of July 2019 to 19th July 2019.

The training seeks to train masters students on Bioinformatics in Biomedical Research through individual training, research mentorship and enhancing institutional capacity in Eastern and Central Africa.

Masters training, being the first stage of specialized training is a strong determinant of the quality of PhD students in the region. Unfortunately, many universities in the region do not offer bioinformatics training at Masters level and those that do often lack sufficient teaching faculty and active research environments where the students can be exposed to high-quality data and emerging bioinformatics techniques.
28 researchers, doctoral students and data managers drawn from Tackling Infection to Benefit Africa (TIBA) partner institutions across Africa undertook a Research Data Management course at the KEMRI Wellcome Trust Research Programme in Kilifi, Kenya from the 24th June to 28th June 2019.

The need for the course was informed by the increasing requirement by funding agencies, journals, and other stakeholders for researchers to archive and share data in a manner that promotes open scientific enquiry. It is therefore vital for researchers and information professionals in TIBA partner institutions to acquire the data management and curation knowledge and skills that support the long-term preservation, access, and reuse of data in an ethical manner.

Besides imparting data management skills, the workshop provided an opportunity for participants to interact with other data managers from across the TIBA network and explore the potential for new collaborations.
Curtains Close on AfriBOP 2019

2019 provided another great opportunity to host the fourth African ImmunoBiology of Parasites, Pathogens and Pathogenesis (AfriBOP) workshop in Kilifi, Kenya.

The workshop attracted a total of 80 participants and is a partnership between KEMRI-Wellcome Trust, the Initiative to Develop African Research Leaders (IDeAL), Pwani University and the University of Glasgow.

The five-day training started on 26th of August 2019 and ended on 30th August 2019. The course targets early career Clinical Scientists, PhD students and early postdoctoral fellows from Africa who have a strong interest in the interaction between the immune system, parasites and other pathogens. It was attended by 80 participants from different African countries.

AfriBOP seeks to empower African Research leaders with knowledge on the biology of pathogen-host relationships involving common tropical diseases that continue to cause public health concerns in the continent – e.g. malaria, HIV and other viral infections, TB, and helminths.

Participants also benefit from grant writing and careers sessions run by scientists who have a strong track record in running successful research programmes.

“I am glad to have been selected to attend AfriBop this year. It has been a wonderful experience with a wide range of faculty that has a lot of expertise. I have learnt a lot on areas of immunobiology that cover parasitic and microbiological areas. Above all I got an opportunity to mingle with faculty and participants that has helped in my journey as a young upcoming immunologist,” remarks Rebecca Chukwuanukwu a participant from Nigeria.

AfriBOP has made remarkable steps in the last four years with the number of applications increasing significantly. “This year, we have had a fantastic faculty and wonderful participants. Happier as the reputation of AfriBOP continues to grow and new students from all over have been part thus a pure reflection of the name,” says Prof. Paul Garside from the University of Glasgow.

Alexandar McKay remarks, “The whole training has developed well, the commitment by the faculty and participants has been amazing. Hopeful that together we continue to build capacity and train Africa’s next African Science leaders.”

The participants were exposed to intensive learning sessions in the first three days, followed by a two-day symposium on the most recent advances in the immunobiology of common infectious diseases. Participants took classes in grant writing with the best grant writing presentation winning a cash prize.

“Thank you for helping us deliver the best immunobiology course in the series (so far), I have heard, especially from the students – that this is the best course they attended (so far),” remarks Francis Ndugu, the Research Degrees Coordinator and part of the AfriBOP organising committee.

As curtains close on this year’s AfriBOP we can only look forward to a better edition next year.
Developing world class research leaders: 2019 DELTAS Africa Scientific Conference

Scientists and fellows from the Initiative to Develop African Research Leaders (IDeAL) were among 300 health scientists drawn from across Africa and other parts of the world for the landmark scientific gathering held in July 2019 in Dakar, Senegal.

The DELTAS Africa Scientific Conference, themed, ‘A critical mass: developing world-class research leaders’ was the first in Francophone Africa.

It was organised through a partnership between the African Academy of Sciences and Senegal based DELTAS Africa network and related Francophone-based programmes including the Malaria Research Capacity Development (MARCAD).

IDeAL which is one of the DELTAS grantees was represented by a team of 21 consisting of staff and fellows. The Conference provided a platform for DELTAS Africa Fellows and researchers at Masters, Doctoral, Post-Doctoral and Senior Research Fellowship levels to present findings of current research.

Scientists from the KEMRI Wellcome Trust Programme and IDeAL were profiled at the meeting. Among those profiled were Dr Symon Kariuki, a Post-doctoral Fellow studying acute seizures in young children, Dr Sophie Uyoga, a Post-doctoral fellow studying the quality of donor blood used for transfusions in sub-Saharan Africa and Dr. Moses Kiti, a CDY fellow looking at the importance of understanding social contact patterns in designing interventions against the spread of respiratory infections.

IDeAL Director, Dr. Sam Kinyanjui gave a keynote address on malaria vaccine during the conference. Sam’s interest is primarily in understanding immunity to Malaria.

The Conference has become the most important annual gathering in the DELTAS Africa community for scientists, experts and institutions promoting The Academy’s vision of transformed lives through fostering excellence in implementing Science, Technology and Innovation (STI) programmes.

“This is a very good conference, as you’ve seen it, represented here are researchers and students from almost all over Africa probably except North Africa. It is an opportunity not just to hear about the science being done in all these different institutions, that are part of the 12 Delta’s consortia but it’s also an opportunity for people to meet and network across Africa,” said Dr. Kinyanjui.
2019 IN BRIEF

British Deputy High Commissioner visits KWTRP

The Deputy British High Commissioner, Susie Kitchens, visited KEMRI Wellcome Trust Research Programme- Kilifi in August 2019. The visit was aimed at understanding the capacity building processes including depth and breadth of the research work being done at the Programme. She also sought to understand the deliberate efforts that the Programme specifically, IDeAL has put towards creating future leaders in science and innovation.

High level DAAD delegation visits the Programme

In July 2019, the Delegation of the German Academic Exchange Service (DAAD) visited KEMRI Wellcome Trust Research Programme- Kilifi. The delegation’s visit was part of preliminary plans ahead of a joint partnership between DAAD and IDeAL for new PhD opportunities. The delegation consisted of 11 German Members of Parliament who are members of committees on Education, Research and Technology Assessment of the German Bundestag (parliament). The delegation had an opportunity to tour the KWTRP facilities as well.

IDeAL Signs MoU with Daystar University

In June 2019, IDeAL signed an MoU with Daystar University. The MoU provides a platform through which IDeAL will collaborate with Daystar University in offering a Masters course in Science Communication.

Communicating what researchers do is central to public appreciation and of science.” said Dr. Kinyanjui during the signing ceremony held at the Daystar University Campus in Athi River.

IDeAL is closely collaborating with several partner institutions to support the provision of high-quality training for young African researchers.

Big Win for Martha Luka in Ghana

IDeAL MSc student, Martha Luka won the runners up award for ‘Best Oral Presentation’ at the just concluded International Society for Computational Biology -Africa (ISCB-AFRICA) Conference on Bioinformatics. The conference was held on November 11 - 15, 2019 in Kumasi, Ghana.

“I’m grateful for the opportunities that IDeAL is providing, especially the recently concluded scientific communication training,” she says.

Ian Oyaro Feted Best Presenter at SANTHE AGM

Ian Oyaro, an IDeAL PhD student won the “Best Presenter” award at the SANTHE Annual Consortium Meeting held in Nairobi, Kenya. The meeting took place between 3rd to 5th October 2019. Over 150 guests from collaborating sites worldwide attended the three-day meeting which featured project updates, student oral and poster presentations, interactive sessions, and an opportunity to network with scientists from diverse backgrounds.

Dr. Obonyo attends African Cardiology Congress in South Africa

Nchafatsi Obonyo, an IDeAL fellow recently attended the African Cardiology Congress in Johannesburg, South Africa. The 2019 theme ‘Meeting the Needs for Africa’ was informed by the ever-changing landscape and epidemic of cardiovascular disease (CVD) on the continent. The four-day programme is the only one of its kind on the African continent and brought together cardiologists, radiologists, radiographers, physicists, biomedical engineers and both undergraduate and postgraduate trainees.

First Cohort of PhD in Health Care Management Inducted

The first cohort of the newly introduced PhD in Health Care Management was inducted in Nairobi. The PhD course is offered jointly by Strathmore University and KEMRI-Wellcome Trust Programme and funded by DAAD.
A visit to the labs using Virtual Reality (VR)

Two iDeAL fellows, Dr. Sophie Uyoga and Dr. Patience Kyriku, are part of thirteen African scientists that received funding to implement innovative community and public engagement projects from the African Academy of Science.

“Growing up seeing a fully operational lab was just but a dream. I want to make it a reality for others! Through the AAS Public Engagement Fund, I will develop a fully operational lab using Virtual Reality for students,” remarks Patience Kyriku. Patience is developing a VR project aiming to explore the use of virtual reality as a public engagement tool for young children aged 10-14 years. Her project aims to develop a VR video of the KEMRI-Wellcome Trust Research Programme, Immunology laboratories to expose children to research and science in general.

Sophie’s project aims to raise the profile of the social issues and challenges that people living with Sickle Cell Disease (SCD) undergo through the development of a comic book. This will help the community understand the social issues and challenges faced by the children and their caregivers and appreciate the role of research in finding better treatments for the disease. SCD is an inherited red blood cell disorder that results in the formation of abnormal haemoglobin. There are over 300,000 children born with SCD every year with most births occurring in sub-Saharan Africa.

Please tell us about yourself and what your research interests are? I just completed my PhD studies. My PhD work revolved around understanding how the malaria parasite can establish infection despite being susceptible to attack from the immune system, specifically the complement system. My research interests are in research in finding better treatments for patients that will make them appreciate the role of science in the society.

Tell us briefly about the CPE grant that you just won? The CPE grant I won is going to implement innovative community and public engagement projects from the African Academy of Science.

What motivated you to apply? While I was on my collaborative study in Finland as part of my PhD studies, I met an MSc student over a science retreat meeting. During our conversation she mentioned how she was using virtual reality to teach science to young people. After that chat I started researching on the various applications of virtual reality.

What was the inspiration/motivation to focus on VR? While I was on my collaborative study in Finland as part of my PhD studies, I met an MSc student over a science retreat meeting. During our conversation she mentioned how she was using virtual reality to teach science to young people. After that chat I started researching on the various applications of virtual reality.

Why virtual reality? What was the inspiration/motivation to focus on VR? Why was this idea so important? Virtual reality allows users to immerse themselves in a simulated virtual world or real-world experience. It allows users to immerse themselves in a simulated virtual world or real-world experience. It allows users to immerse themselves in a simulated virtual world or real-world experience.

What is exceptional about the VR project? VR has been touted as the next frontier in science communication. It allows users to immerse themselves in a simulated virtual world or real-world experience. VR has been touted as the next frontier in science communication. It allows users to immerse themselves in a simulated virtual world or real-world experience. VR has been touted as the next frontier in science communication. It allows users to immerse themselves in a simulated virtual world or real-world experience.

What does the future hold in regard to this particular project? This project has opened up other areas for future research and community engagement projects.
The 10th Cohort of School Leavers Completes Attachment

The 10th cohort of the KEMRI School Leavers Attachment Scheme (SLAS) completed their annual attachment. The students joined the scheme on 13th March 2019 and left on 31st May 2019. During the attachment, the students went around the 5 KEMRI-Wellcome Trust Departments on fortnightly rotations.

The scheme was advertised through various online and offline platforms attracting a total of over 90 applicants. More than 90 eligible students were invited for an open day, after which 28 were invited for face-to-face interviews. Nine students went through the competitive process successfully. So far 80 students have gone through the scheme successfully.

The KEMRI School Leavers Attachment Scheme is aimed at giving Kilifi’s very talented students a taste of research whilst attracting more young people to research aiming to generate a critical mass of African research leaders.

Attache Participates in The London International Youth Science Forum (LIYSF)

George Ziro, one of the 2019 School Leavers Attachment Scheme (SLAS) attaches was selected to participate in The London International Youth Science Forum (LIYSF). LIYSF is a two-week residential student event held at Imperial College London and The Royal Geographical Society. The event features lecture demonstrations from leading scientists, visits to world-class laboratories and universities combined with cultural interaction, with 500 students aged 16–21 years old from 70 countries. This year’s conference was held from the 24th July – 7th August 2019.
3rd Masters Cohort Completes Studentship

**Faith Marura**
"At IDeAL, I got trained, mentored and exposed to a lot of opportunities in scientific research and research leadership. I interacted with scientists within the Programme and learnt a lot from them," says Faith Marura, a master’s student from the University of Nairobi.

Her project is working on the discovery of antigens that have a potential of being vaccine candidates. "If we develop an effective malaria vaccine we will reduce the number of malaria deaths which will help improve the economy of malaria-endemic countries," she narrates.

**Brian Roy Omondi**
"A healthy Africa is a prosperous Africa" quotes Brian Roy Omondi, a master’s student from Egerton University, who observes that this was his drive to pursue Biochemistry. For his Master’s project, he sought to understand naturally acquired malaria transmission-blocking immunity to fast track the development of malaria blocking vaccines that will help lower malaria transmission. His research could aid in achieving the 90% reduction in mortality and morbidity arising from the disease.

**Andrew Egesa**
Andrew is interested in better management of infectious diseases using biotechnological tools. During his studentship, he investigated the performance characteristics of molecular diagnostics of respiratory viruses. The findings will be key in the surveillance and management of these pathogens.

His research is geared toward improving the surveillance of respiratory viruses in humans.

**Everline Onyango**
After her cousin who worked in an HIV research lab inspired her, Everline pursued Biochemistry for her Undergraduate and Microbiology at Pwani University for her Masters.

She has been exploring the one way through which malaria parasites and the human host interact, enhancing the severity of malaria.

Everline observes that “This was a very good platform to kick-start my career as a researcher. I have gained a lot of scientific skills, effective communication, and the importance of building networks.”

**Caroline Mburu**
Caroline’s love for mathematics and a drive for a healthy nation sparked her interest in using statistical and mathematical analytical tools in disease prevention and management. This was her inspiration to pursue a Master’s in Medical Statistics at the University of Nairobi.

"This master’s studentship has helped me understand the evidence required to impact vaccine introduction in a country. It has enabled me to learn the use of mathematical modelling skills in infectious disease control," she remarks.

Her research project is on the cost-effectiveness of introducing a typhoid conjugate vaccine in Kenya. The results achieved will guide the introduction of a vaccine that will cause the eradication of typhoid.

**Arnold Lambisia**
"I remember being introduced to my KEMRI-Wellcome Trust supervisors for the first time. I expected to meet some stern and serious faces but alas! They were very friendly and welcoming," recalls Arnold Lambisia.

Arnold is pursuing a Master’s in Molecular Biology and Bioinformatics at the Jomo Kenyatta University of Agriculture and Technology (JKUAT), driven by his curiosity on the human biology subject. He wanted to understand how bioinformatics tools are used to analyse big data and be able to answer questions on infectious diseases in their biological, environmental and social contexts. His master’s project is investigating viral and diarrhoeal aetiology.

"As I step out into the research field and strive to be a research leader in Africa and Globally I feel confident as my studentship at IDeAL has honed my scientific skills. I have received mentorship from top research scientists who have paved the way ahead for me," remarks Arnold.

**Peninah Makusa**
"What I find interesting about science is that it allows the discovery and exploration of new ideas. I have always wanted to delve deeper into this field as I believe it holds the key towards improved quality of life," says Peninah Makusa who is pursuing Master of Science in Biotechnology at the University of Nairobi.

Her project is on ‘Antibody response to Malaria parasite in an infected and recovering cohort of children in Kilifi, Kenya.’ The project aims to look at antibody responses to parasite antigens at acute disease and during the recovery period to see if the magnitude of antibody responses to the antigen subtypes change over time. The project will inform the development of a more efficacious vaccine against malaria.

**John Mutiso**
John is pursuing a Master of Science in Medical Statistics at the University of Nairobi hoping to become a research leader in Africa. His master’s project is geared towards developing a data analysis framework that removes technical variance in data got from high throughputs tools used in investigating immunity. The tool can be used to pre-determine targets of vaccine development, hence a successful step towards the fight against infectious diseases.

"Ten months at IDeAL and I am better in the application of my specialty in research. I’m motivated and have learned a lot, not only in academics and research but also, interacted with great people," says John.

**Jacqueline Wahura**
Jacqueline is pursuing MSc in Molecular Biology and Bioinformatics. Her project is on the whole-genome sequencing of the Respiratory Syncytial Virus (RSV), using the long-read technology, intending to develop a sequencing protocol for respiratory viruses using this technology. The overall aim of the project is to use the technology to understand the transmission patterns of respiratory viruses, intending to guide the development of management interventions.

**Samuel Nyamweya**
Samuel, a master’s student at Jaramogi Oginga Odinga University, is researching on health systems, examining the career choices and pathways of graduate nurses trained in semi-urban settings. His project focuses on addressing Human Resource for Health (HRH) challenges in Low Middle-Income Countries and ways of scaling up Universal Health Care.

Samuel has enjoyed his 10-month studentship and further adds, “My experience at IDeAL influenced my perspective regarding health systems research. I am now more determined, more focused with more energy to advance my career in health systems research to enable me to contribute towards strengthening health systems in Kenya.”
A total of 21 MSc students joined us in 2019 making the fourth MSc Cohort. The fellows are undertaking various masters programmes including immunology and bioinformatics.

In line with our mandate and commitment to churn a critical mass of African research leaders, our Masters Studentship Scheme seeks to support talented students registered at local universities complete their research project training component as well as support the students to pursue taught courses at Pwani University.

The Postgraduate Diploma Course in Health Research Methods offered jointly with KEMRI-Wellcome Trust Research Programme and Pwani University is a unique learning opportunity that equips recent graduates with theoretical and practical knowledge on the philosophy and practice of research to enhance their transition into a research career or further postgraduate training.

In 2019, 19 young graduates joined the program working on various projects.

It was all pomp and celebration as 25 IDeAL Postgraduate Diploma students graduated during the 7th Pwani University graduation ceremony held in Kilifi.

The fellows who started their studentship in September 2018 were registered at Pwani University undertaking a Postgraduate Diploma in Health Research Methods.

The course, jointly offered by KEMRI-Wellcome Trust and Pwani University is now on its fourth cohort having trained 85 fellows with a 100% success rate.

Over the last 4 years, we have enrolled 84 students in our different training schemes, 60 of whom have completed their training.

Whilst we take pride in this great achievement, our emphasis goes beyond numbers. We are keen to see a large proportion of our students transition to the next level on the research career ladder.

MEET THE 2019/20 IDeAL POSTGRADUATE DIPLOMA FELLOWS

The course covers all types of health research from basic biomedical research to social sciences and health system research and provides an opportunity for the students to develop a deep appreciation of the various elements of research through the attachment undertaken in an active research environment.

In 2019, 19 young graduates joined the program working on various projects.