African Genetic Biocontrol Consortium

BUILD | INFORM | EXPAND

1ST GLOBAL CONGRESS ON **NEW EMERGING** GENETIC BIOCONTROL **TECHNOLOGIES**

***Theme:** New and Emerging Genetic Biocontrol Technologies:*

Progress made in the Science, Research, Testing, and Environmental Release of Experimental Genetically Modified Biocontrol Products

Organized by African Genetic Biocontrol Consortium

August 30- August 31, 2023, Safari Park Hotel, Nairobi, Kenya

PAMCA · AFRICA ONE HEALTH NETWORK · AFBSA · NASAC · GENECONVENE GLOBAL COLLABORATIVE · FNIH Foundation for the National Institutes of Health

About The African Genetic Biocontrol Consortium

The Africa Genetic Biocontrol Consortium (the Consortium) was established as an agreement among member organizations committed to the mission and goals to contribute to expanding African self-determination of the course of research, development, and use of genetic biocontrol approaches for controlling and eliminating malaria and other vector-borne diseases in Africa.

The Consortium was officially launched on November 30, 2020 by not-for-profit member organizations based in Africa that included the Africa One Health Network (AfOHNet), Africa Biological Safety Association (AfBSA), The Multilateral Initiative on Malaria (MIM), Network of African Science Academies (NASAC), Pan-African Mosquito Control Association (PAMCA) and the GeneConvene Global Collaborative (GeneConvene).The member organizations of the Consortium are regionally represented non-governmental professional or similar organizations representing disciplines such as biomedical research, biotechnology, entomology, vector control, public health, animal sciences, biosafety, ecology, environmental sciences, social sciences, and public engagement who are interested in genetic biocontrol technologies.

The Consortium is guided by a vision that seeks to build an informed local leadership to support decision-making on the utility of genetic biocontrol technologies for public health and requirements for their development in Africa. This will be achieved through a mission that aims to expand African self-determination of the course of research, development, and use of genetic biocontrol approaches for public health. To fulfil this mission the Consortium will provide a platform for interaction among African experts and institutions to enhance opportunities for technical capacity strengthening, knowledge exchange and deliberation about the challenges and opportunities of genetic biocontrol technologies for public health, which will amplify African influence on their development and provide critical input for decision-making by product developers, policy makers, and other stakeholders.

The approach of the Consortium is to provide the member organizations to conduct activities individually and/or jointly under the Consortium brand. It is expected that the Consortium will use its collective leverage to attract funding for activities and to inform other stakeholders. To achieve the desired impact, the Consortium will adhere to a set of core values in planning and executing its mission. These include teamwork, collaboration, power of negotiation, complementarity and strengths, continual improvement, transparency, and accountability.

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About the 1st Global Congress on New Emerging Genetic Biocontrol Technologies

The Consortium is delighted to announce the 1st Global Congress on New and Emerging Genetic Biocontrol Technologies to take place in Nairobi in August 30 to August 31, 2023. The aim of the Congress is to bring together experts from around the world to share learnings across diverse disciplines related to genetic biocontrol technologies in a four-day hybrid event at the Safari Park Hotel.

This Congress promises to be an engaging and stimulating event. Attendees interested in genetic biocontrol drawn from a broad spectrum of vector biologists, biosafety, and biosecurity, pharmaceutical, biotechnology research, development and clinical organizations are expected to attend. The conference draws national and international attendees from academic, commercial, research, non-governmental, and governmental sectors. It is a great opportunity to showcase your products to a broad audience of professionals.

Exhibition Opportunities

The Congress offers you exposure to the many delegates of the conference and the opportunity to showcase your products and services to a global pool of customers. The exhibition area has been designed to provide the best possible promotional opportunities to participating companies. The exhibition will provide delegates and exhibitors with excellent opportunities to network and will be placed in the beautiful and spacious foyer of the hotel outside the conference rooms.

Who Should Exhibit?

Anyone who supplies, manufactures, provides services or products used in biomedical research, biosafety and biosecurity, the media fraternity and training institutions should exhibit.

When and Where

The 1st Global Congress on New Emerging Genetic Biocontrol Technologies, organized by the African Genetic Biocontrol Consortium will be held from August 30 - August 31, 2023 at the Safari Park Hotel, Nairobi, Kenya.

Exhibition Schedule

The exhibition will be open from 8:00am – 6:00pm daily from August 30 – 31, 2023

Exhibitors will set up their booths from August 30, 2023

Exhibitors will be required to remove their displays on August 31, 2023

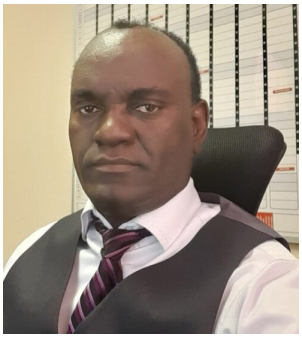
Congress Planning Committee

The Congress Planning Committee is an ad hoc committee of the Consortium comprised of the Steering Committee members together with volunteers to assist in the planning of the 1st Global Congress on Biocontrol.

The Conference Committees will be comprised on three subcommittees;

1. Planning Committee
2. Scientific Programme Commitee
3. Local Organizing Commitee

Members of the Planning Committee



Dr. Misheck Mulumba
Congress President

Dr Misheck Mulumba is the head of Animal Health and Protection at the Agricultural Research Council-Onderstepoort Veterinary Institute (ARC-OVI). He is a member of the World Organisation for Animal Health (OIE) Scientific Commission for Animal Diseases (SCAD) and the current Chairperson of the African One Health Network (AfOHNet). He holds a Bachelor of Veterinary Medicine Degree (BVM) from the University of Zambia, A Master of Science degree from Reading University and a Doctor of Philosophy (PhD) from the Prince Leopold Institute of Medicine in Belgium. His background training is in Epidemiology, Ticks and Tick-bone diseases and Transboundary animal diseases (TADs). He has extensive field and laboratory experience in the following fields; vaccine production, TADs especially foot and mouth disease (FMD), peste des petit ruminants (PPR), contagious bovine pleuropneumonia (CBPP), trypanosomosis and tick-borne diseases (TBDs). He has published extensively on TBDs and TADs. His interest branched off into One Health and he currently serves as the Co-Chair of the South African One Health Forum and the current Chairperson of the African One Health Network (AfOHNet) and the African genetic biocontrol consortium. He is also an Editor on the PLoS journal. He is also the Editor in Chief of the Onderstepoort Journal of Veterinary Research. His previous positions include being Director for the African Union/Centre for Ticks and Tick-borne Diseases (AU/CTTBD); and Project Coordinator and Network Surveillance Expert on the $21.6m African Development Bank funded project for the then 15-member Southern African Development Community (SADC). He was also the Chief Veterinary Officer and Sub-program Manager, Animal Production and Health for the Ministry of Agriculture, Food and Fisheries in Zambia; Project Manager for ASVEZA, a Belgium-funded animal health project where he was responsible for the administrative, financial and scientific management of the project. He served in the veterinary field services as a Government Veterinary Officer in Zambia. Dr Mulumba is also a founding member of the African Chapter of the Wildlife Disease Association (WDA) the IUCN Veterinary Specialist Group and the Veterinary Association of Zambia (VAZ). Dr Mulumba is a member of the Academy of Science in South African (ASSAf) Standing Committee on Biosafety and Biosecurity.

Jackie Olang Kado
Congress Vice President

Mrs. Jacqueline Kado is the current Vice Chairperson of the Consortium Steering Committee and the Congress Vice President. She holds an MA-PPM in Project Planning and Management from the University of Nairobi (UoN) and a Bachelor of Education (B.Ed.) degree in Commerce and Mathematics, also from UoN.

She currently serves as the Executive Director of the Network of African Science Academies (NASAC) secretariat based in Nairobi, Kenya. NASAC is a consortium of science twenty-eight science academies in Africa, with a membership drawn from all spheres of science. Her role ensures that NASAC activities are implemented in a coordinated and timely manner, and that secretariat functions are executed optimally. She has also served science academies in various capacities since the establishment of NASAC in 2001. She has functional knowledge of French and is specialized in project management for policy-advice through science and by scientific institutions. She is a Fellow of the Academy of Engineering and Technology of the Developing World (AETDEW), and also a member of the Belt and Road International Science Education Coordinating Committee (BRISECC).

Emma Orefuwa
Member

Emma is a representative of PAMCA in the Steering Committee and a member of the Congress Planning Committee. As a second-generation African diasporan of Nigerian and Seychellois descent, Emma Orefuwa has a passion for supporting Africans to act as agents of change, and for facilitating African solutions to African problems. She is the co-founder of the Pan-African Mosquito Control Association (PAMCA), an African-led network of scientists, Public Health professionals, and other stakeholders dedicated to identifying unified approaches to fighting vector-borne disease across the African continent. She is also supporting the set-up of the African Gene Drive for Vector Control Network, a new initiative of PAMCA. Emma brings 15 years of Public Health experience and has held a number of high-profile project and programme management roles within the UK National health service, International Development, and Global Health sectors. Emma currently serves as Director of Programmes, Africa, for UK/Swiss-based NGO the Global Action Fund for Fungal Infections (GAFFI), with responsibility for supporting GAFFI's ambassadors, regional networks, program development, and strategic partnership building.

Leon Mugenzi
Member

Dr Leon Mugenzi represents MIM in the Consortium Steering Committee. He is a biochemist, molecular biologist (MSc) and entomologist trained at the University of Buea, Cameroon. His doctoral research focused on the transcriptional regulation of genes mediating insecticide resistance in the major malaria vectors. He is currently a postdoc at the Centre for Research in Infectious Diseases (CRID) where he works on a project funded by Bill and Melinda Gates Foundation to understand the dynamics of insecticide resistance and design molecular tools to track resistance in malaria vectors in the field. This involves using genomics and transcriptomics and functional genomic approaches to answer these questions.

Martin Bundi
Member

Dr. Bundi's background is in Medical Science and specialized in Microbiology at PhD. His basic degree is Biochemistry, with MSc in Biotechnology. Over the last 12 years, he has researched on epidemiologic characterization of enteric infections outbreaks, utilizing molecular and phenotypic methods to understand the ecology, pathogenic mechanisms and antimicrobial resistance. Some of the pathogens of public health importance he has conducted research on include Vibrio cholerae, E. coli and rotavirus. He works as an Assistant Principal Research Scientist and the Acting Director, Director, Research Capacity Building at the Kenya Medical Research Institute (KEMRI). He is also a visiting researcher at the Institute of Tropical Medicine, Nagasaki University Kenya Research Station (NUITM-KEMRI). His research interest has focused mainly on infectious diseases, including investigating food-borne pathogens and enteric bacteria associated with diarrheal disease in Kenya, identifying a comprehensive approach for early detection of potential TB patients in the community, infection prevention and control and healthcare associated infections, and capacity building in biosafety and biosecurity. He is certified by the International Federation of Biosafety Associations (IFBA) as a Biosafety Professional and a Global Biosafety mentor in Biorisk Management and Biosecurity. He has supported KEMRI since 2010 in training new BSL-3 laboratory users and conducting other biosafety and biosecurity trainings. Currently he serves as the President for the African Biological Safety Association (AfBSA).

Scientific Programme Committee

The role of this subcommittee will be to determine the theme of the annual conference; develop and release the Call for Proposals; review all submissions; and define the schedule

Members of the Scientific Programme Committee include:

David O'Brochta, Ph. D.,
Chairman

David O'Brochta is the Technical Lead for FNIH's activities related to gene drive technology. Previously, as a Professor at the University of Maryland, he taught extensively in the areas of Genetics and Insect Biotechnologies.

He is trained in entomology and molecular genetics and until recently had an active research program focused on the development of transgenic insect technologies and their applications to fundamental and applied problems in medical and agricultural entomology. His work in vector biology focused on the development of transgenic mosquito technologies and their applications to the study of mosquito/parasite interactions and he has used "gene editing technologies" in his research programs. He is a Fellow of the Royal Entomological Society, President of the Physiology, Biochemistry and Toxicology Section of the Entomological Society of America and past Editor of the Royal Entomological Society's journal, Insect Molecular Biology. He was the founding Director of the Insect Transformation Facility in the University of Maryland's Institute for Bioscience and Biotechnology Research, a facility providing genetic technical services, including gene editing, and training to insect scientists in support of their research.

Prof Dorington O. Ogoyi,
Vice Chairman

Prof Dorington Ogoyi is an Associate Professor in the Department of Biochemistry and Biotechnology, The Technical University of Kenya. He is the immediate former Chief Executive Officer at the National Biosafety Authority where he served initially as the Director, Technical Services (2012-2018). He holds a PhD (Biochemistry) degree from the University of Nairobi and an Executive MBA (2015) degree from Moi University. At the National Biosafety Authority, he had the opportunity to steer the Authority through its initial stages and contributed to the Authority's transformational growth over the years. He also taught for several years at the Department of Biochemistry, University of Nairobi. Over the years, he has carried out research and mentored a number of graduate students in a wide range of research areas in Molecular Biology and Proteomics. Prof. Ogoyi has previously served as the National Focal point for Cartagena Protocol on Biosafety, the National Focal Point for the Biosafety Clearing House and represented the African region in the Compliance committee of the Cartagena Protocol on Biosafety.

Owain Edwards,
Member

Dr Owain Edwards obtained a BSc in Zoology from the University of Guelph in 1986. He was awarded his MSc in Entomology from the University of Missouri-Columbia, USA, in 1989 and his PhD in Entomology from the University of California, Berkeley, USA, in 1994. Prior to joining CSIRO in 1998, Dr Edwards undertook postdoctoral studies at the University of Florida and the US Department of Agriculture to study ecological and genetic factors controlling the establishment of natural enemies in classical biological control programs. As a Project Leader in CSIRO based in Perth, Western Australia, his research has focused primarily on the molecular basis of aphid-host plant interactions, which includes a leadership role in the International Aphid Genomics Consortium (IAGC) and strong collaborations with the Institute of Zoology (CAS Beijing), Kansas State University (USA), INRA Rennes (France) and BGI Shenzhen (China). His work on aphids has now broadened to examine the molecular basis of all aphid interactions with the environment, including the genetic and epigenetic factors controlling aphid polyphenism. Dr Edwards also provides insect genomics leadership internationally on the coordinating group of the i5K initiative to sequence 5000 insect genomes. Most recently, he has embarked on innovative research applying insect metagenomics methods for biodiversity and biosecurity applications.

Claus Schweinheim,
Member

Claus Schweinheim is a professional engineer with over 25 years of experience in design, construction administration and commissioning of technically complex laboratory projects, a wide range of commercial, industrial and government facilities. He is well versed in domestic and international guidelines and standards and have focused on biological containment laboratories and animal facilities including BSL-3, BSL-3 Ag and BSL-4 facilities He is focused on the application of mechanical systems designed to protect the people, facility, and other assets present in laboratories where listed select agents and toxins are used and handled. Claus Schweinheim is an expert in providing and integrating effective solutions to meet the highly complex requirements of these facilities. Mr. Schweinheim´s role as a technical leader ensures the multiple disciplines of design are integrated with project objectives including sustainable practices that are mandatory for all on-going projects.

Vibha Ahuja,
Member

Based in New Delhi, India, Dr. Vibha Ahuja, Ph.D. (Microbiology) serves as Chief General Manager of Biotech Consortium India Ltd. She is an expert on biosafety and regulatory aspects, particularly with reference to genetically modified organisms, having more than 25 years of experience in the field. She is very well versed in issues related to the Indian biosafety regulatory framework and has been involved in the formulation and dissemination of guidelines. She has led the preparation of biosafety documents and communication/outreach activities to stakeholders. Throughout her long and distinguished career, she has been actively involved in capacity building initiatives in India and throughout South Asia.

Dr. Ahuja has been actively engaged in the policy issues related to gene editing in India through engagement in the development of policy briefs by National Academy of Agricultural Sciences and member of drafting committee constituted by the Department of Biotechnology. She also organized stakeholder consultations and programmes for creating awareness about regulations of gene editing.

Eric Okoree,
Member

Eric is the Chief Executive Officer of the Ghana National Biosafety Authority. He has a background in Environmental Science with Biosafety as specialization. He started his career as an Assistant Director at the Ministry of Environment, Science and Technology in 1999. As the schedule officer for Biodiversity and Biosafety, he contributed to the drafting of Ghana's Biosafety Bill and facilitated its passage into Law in 2011. He eventually became the CEO of the National Biosafety Authority in 2015 and has since been ensuring the effective running of the sector. Coaching and mentorship in biosafety skill set, both nationally and regionally have been his passion in recent years. He has served as a resource person in several biosafety training programmes in Ghana and Africa. He has been part of Africa's group of negotiators in the Conference of Parties of the CBD. He currently represents Africa on the Bureau of the CBD Conference of Parties.

Dr Martin Lema,
Adjunct Professor,
National University of Quilmes' School of Biotechnology, Argentina

Dr Martin Lema is an Adjunct Professor at the National University of Quilmes' School of Biotechnology. He has more than 20 years of academic experience in teaching, research, technology transfer, and entrepreneurship. He is the author of multiple publications on different aspects of biotechnology, including research, education, policymaking, and biosafety. In addition to his current role in academia, Martin has 15 years of experience as a policymaker in agricultural biotechnology, including 8 years as Director of Biotechnology in the Argentine Government and Chair of the National Biosafety Commission. Among other achievements, under his leadership, this Commission was recognized as an FAO Center of Reference for Biosafety. During his tenure, the Argentine Government issued the first ad hoc regulation for genome editing applied to agriculture in the world. Martin also served as Argentina's delegate to numerous international negotiations related to biotechnology over 15 years, in fora including the WTO, OECD, and FAO.

Prof Charles Mbogo,
Member

Prof Charles Mbogo is a public health entomologist with over 20 years' experience in the conduct of entomological studies in Kenya, Ethiopia and Eritrea. His focus has been the study of malaria vectors and has worked on the large-scale evaluation of insecticide-treated bed nets, insecticide resistance, and integrated vector management (IVM) strategies. He has developed and implemented vector surveillance systems at local and national scales. Charles serves on various national and international technical committees. He maintains a keen interest in translating research into policy and practice and played an important role in the formulation of national policy on IVM. He is the current President of the Pan African Mosquito Control Association (PAMCA), an association of African entomology professionals dedicated to Improving human health through suppression of mosquitoes and mosquito borne diseases.

Marceline (Lina) Finda, PhD
Member

Lina Finda is the Deputy Head of the Environmental Health and Ecological Sciences (EHES) at Ifakara Health Institute. Dr. Finda has a BSc in Biochemistry from Western Washington University in Washington State (2010), a Master of Public Health from Tulane School of Public Health and Tropical Medicine in New Orleans-Louisiana (2014), and a PhD in Public Health from the University of the Witwatersrand in South Africa (2021). Her PhD research investigated key stakeholders' awareness and perceptions of alternative interventions for speeding up malaria control and elimination efforts in Tanzania. Dr. Finda has also completed a post-doctoral fellowship at the University of California-San Diego (2022), where she was a part of the team developing a framework to guide ethical and meaningful stakeholder engagement for research, development and deployment of gene drive technologies for vector control. More recently, Lina has concentrated her efforts on facilitating discussions among key African stakeholders about how gene drive technologies should be packaged to maximize the potential for malaria control and elimination in Africa.

Agha Ukpai Agha,

Acting Director, National Biosafety Management Agency in Nigeria

Dr. Agha Ukpai Agha is an Acting Director, in National Biosafety Management Agency, Nigeria. As a regulator, Dr. Agha has headed three technical Department in the Agency, namely; Food Safety and Social Economics Department, Environmental Biosafety and General Release Department and presently Acting Director, Biosecurity Department. Dr. Agha studied Forestry and Environmental Management in his first degree, plant Biotechnology and Biosafety in his Second degree in Australia, and PhD in Nigeria. He has been trained in the area of Biosafety and Biosecurity as a regulator in different countries such as India, Australia, USA, Indonesia, South Africa, Italy, Geneva, Ghana, and a host of others. He has also gone on different study tours on Biosafety and Biotechnology especially in India and USA. Dr. Agha is a regulator of Modern Biotechnology and also an expert on Biosecurity and Biosafety matters in Nigeria

Thato Mogapi,

Assistant Director: Biosafety and Alien Invasive Species, Department of Forestry, Fisheries and the Environment.

Ms Thato Mogapi is an Assistant Director: Biosafety and Alien Invasive Species at the Department of Forestry, Fisheries and the Environment in South Africa. Ms. Mogapi is responsible for implementing the National Environmental Management: Biodiversity Act (Act 10 of 2004) provisions on genetically modified organisms (GMOs). She is responsible for, among others, conducting environmental risk assessments (ERA); evaluating GMO applications; developing ERA guidance documents; coordinating biosafety research; and coordinating national implementation of the Cartagena Protocol on Biosafety and related programmes under the Convention on Biological Diversity.

Ephy Khaemba,

Manager, Research compliance and Environment Health and Safety, ILRI

Ephy Khaemba Has global responsibility for Research compliance & amp; Environment, Health and Safety at ILRI. She is a member of: The National Institute for working Life – Sweden, American Biological Safety Association – USA, African Biological Safety Association, Registered Environmental Auditor– Kenya, Registered Occupational Health & Safety Auditor - Kenya, Regional Biosafety and Occupational Health trainer- Currently with Sandia & AfBSA & amp; CDC. Ephy is certified by the International Federation of Biosafety Associations (IFBA) as a Biosafety Professional and a Global Biosafety mentor in Biorisk Management and Biosecurity. She has also supported many Institutions in Africa to develop their research compliance frameworks e.g. UVRI, Makerere University, University of Nairobi Vat school, KEMRI, KALRO, DVS Ouagadougou University (Microbiology) etc. Her background training is in Biochemistry and Microbiology and OHS.

Dr. Larbi Baassi,

Biosafety advisor and Executive assistant at the National Institute of Hygiene in Rabat, MoH of Morocco

Dr Larbi Baassi is a Biosafety advisor and Executive assistant at the National Institute of Hygiene in Rabat, Ministry of Health of Morocco. Dr Baassi is a "Africa Region Subject Matter Expert" under the Africa CDC Regional Biosafety and Biosecurity Initiative. He is also International Federation for Biosafety Association (IFBA) Certified Professional in the field of Biorisk Management and Biosecurity. Dr Baassi has participated in many Biosafety and Biosecurity (BSBS) monitorship programs as a mentor. He conducted many BSBS trainings programs, in Morocco and in some other African countries in cooperation with many international organizations like IFBA and US Sandia National Laboratories (SNL). He has coordinated project activities pertaining to Biosafety, Biosecurity, Biorisk management and laboratory with US CRDF-Global, the US George Town University. Dr Baassi is the President founder of the Biorisk Management Association of Morocco (BMAM) and the Vice president of the African Biological Safety Association (AfBSA).

Andrew Kiggundu,

Research officer National Agricultural Research Organization, Uganda

Dr. Andrew Kiggundu is a principal research officer affiliated with the National Agricultural Research Organization in Uganda. He specializes in plant biotechnology, regulatory bio-safety, stewardship, and communication for policy advocacy in Africa. He has served as a leader of the Biotechnology and Biodiversity Programme leading teams that worked toward sustainable utilization of plant genetic resources and application of biotechnology tools to improve African food crops for disease and pest resistance and was part of the team that archived regulatory approval of virus resistant cassava in Kenya. As CEO of Papyrus Biotechnology Ltd, in Kampala, he is currently consulting for the GeneConvene Global Collaborative on developing communication tools for regulatory decision-making in Africa for Gene Drive technology being developed for mosquito control.

Local Organizing Committee

Willy K. Tonui, PhD, EBS
Head of Secretariat & Chairman Local Organizing Committee

Dr. Willy Kiprotich Tonui, EBS is the Chairman and Executive Director Environmental Health Safety (EHS Consultancy Ltd) a Consulting firm based in Nairobi, Kenya. The firm currently provide consultancy services to GeneConvene Global Collaborative on Genetic Biocontrol projects in Africa. He was the inaugural Chief Executive Officer at the National Biosafety Authority (NBA), Nairobi, Kenya (2012-2018). He has also served as the Chair of the Board of Directors for the global International Federation of Biosafety Associations (IFBA); Founder and the Past Chair of the Association of National Biosafety Agencies in Africa (ANBAA) a network of Government biosafety regulatory agencies in Africa and also, the Founder Member and Past President of African Biological Safety Association (AfBSA) a professional association that seeks to congregate practitioners of biological safety, promote biosafety and biosecurity as a discipline through awareness and to facilitate the sharing of biosafety and biosecurity information in the African region. For his distinguished service in Biosafety, he was recently decorated with the "Elder of the Order of the Burning Spear (EBS)" by the President of Kenya.

Caroline Thuo,

Congress Communication Specialist.

Caroline Thuo is a communication specialist with 14 years of experience in media. She has a BA in Journalism, Media Studies, and Communication from the University of Nairobi. She also holds a certificate in French from Alliance Française. She has had experience working in communication and media as a specialist both in TV and Digital. She has participated in initiatives that address key global concerns in the community such as, social advocacy, reproductive health, Gender-Based Violence, Women, and Youth Empowerment. She supports the African Genetic Biocontrol Consortium as the Communications and Marketing Manager. She manages and handles the distribution of Consortium information, monitors external communication, creates awareness of the consortium initiatives, programs activities, events, and advocacy resources. Caroline is passionate about media and communication matters, ensuring that she innovates change one individual and business at a time.

Willy Kibet,
Congress Scientific and Technical Coordinator.

Willy Kibet supports the African Genetic Biocontrol Consortium as a Scientific and Technical Coordinator. He is the primary administrative liaison between the Consortium and stakeholders and manages progress reports on all technical activities. He organizes on behalf of the Secretariat teleconferences, meetings and workshops and drafts meeting summaries and reports. He also supports genetic biocontrol training and capacity strengthening efforts on behalf of the Secretariat. He holds a master's degree in biotechnology, a BSc in Biochemistry from Kenyatta University. His previous research work was on the use of modern tools of biotechnology with the goal of alleviating biotic and abiotic challenges, which is in line with the Sustainable Development Goals (SDGs).

Andrew Kipkoech,
Congress ICT Support

Andrew Kipkoech supports the African Genetic Biocontrol Consortium as an ICT Coordinator. He is the primary responsibility is to manage information technology and computer systems, control and evaluating IT and electronic data operations within the Consortium. He holds a BSc degree in Informatics and Computer Science from Strathmore University.

Gilbert Rotich,
Congress Finance and Administration

Gilbert Kipkorir Rotich, Finance and Administration Coordinator, The African Genetic Biocontrol Consortium, Nairobi. Gilbert Kipkorir Rotich is a Finance specialist with over 5 years of experience in Auditing, accounting Tax and Risk Management. He holds a BCom degree in Finance option from the University of Nairobi. He is also Certified Public Accountant of Kenya (CPA K). His main responsibility is to provides support in the effective financial and administrative monitoring of the projects, in compliance with external donors and contractual obligations and in compliance with policies and procedures. This includes support to financial and administrative planning, keep track of timely cash flow of project transfers with the appropriate supporting documentation, monitoring and reporting, audit and budgetary controls, monitoring of projects requirements and support for procurement of services. Kipkorir is passionate about finance, Risk management and putting commensurate effort to provide accurate information for decision making.

AUGUST 30 – AUGUST 31, 2023

Congress Programme

THE CONGRESS PROGRAMME AT A GLANCE

DATE	TIME	SESSION	SESSION TITLE	VENUE
August 30, 2023	9.00-10.30am	1	Opening Ceremony and Keynote Address.	The Pavilion
	11.00-13.00pm	2	Progress Made in Regulatory Frameworks and Decision-Making Process for Emerging Biotechnologies.	
	13.00-14.00pm		Poster Session	Break out Room 1
	14.00-16.30 pm	3	Session 3A: Science, Research, Testing, And Environmental Release of Experimental Genetically Modified Crops	The Pavilion
	14.00-16.30 pm		Session 3B: Requirements for Safety and Security During Biocontainment and Testing of Genetic Biocontrol Products.	Breakout Room 1
August 31, 2023	8.30 am- 10.30am	4	Gene Drive Research, Development and Applications	The Pavilion
	11.00 am-13.00pm	5	Session 5a: Malaria Vector Control	
			Session 5b: Public Engagement and Stakeholder Participation During Testing and Commercialization of Genetic Biocontrol Products	Break out Room 1
	15.00-15.00pm	6.	One Health Approaches and Conversations towards Managing Diseases in Africa.	The Pavilion
	16.00pm	THE CONGRESS ENDS		

DAY 1: AUGUST 30, 2023		Venue
SESSION 1: OPENING CEREMONY AND KEYNOTE ADDRESS **MODERATOR: DORINGTON OGOYI**		The Pavilion
9.00- 10.30 am	**Welcome Remarks:** Willy Tonui, Local Organizing Committee **Opening Remarks:** Mike Santos, FNIH **Congress Keynote address** **"The impact of Kunming-Montreal Global Biodiversity Framework to Africa".** ***Eric Okoree, CEO, NBA-Ghana.*** This Congress Keynote address will provide an overview of the Kunming-Montreal Global Biodiversity Framework (GBF) which was adopted during the fifteenth meeting of the Conference of the Parties (COP 15) following a four-year consultation and negotiation process. This historic Framework, supports the achievement of the Sustainable Development Goals and builds on the Convention's previous Strategic Plans, sets out an ambitious pathway to reach the global vision of a world living in harmony with nature by 2050. Among the Framework's key elements are 4 goals for 2050 and 23 targets for 2030. The speaker will highlight how parties and stakeholders will be impacted from this Framework and how Africa should position herself to achieve these targets.	
10.30-11.00	**Tea Break and Photo session**	

SESSION 2: PROGRESS MADE IN REGULATORY FRAMEWORKS AND DECISION-MAKING PROCESS FOR EMERGING BIOTECHNOLOGIES MODERATOR: JACKIE KADO		The Pavilion
11.00 - 11.30 am	Biosafety regulatory framework and building capacity for genetic biocontrol research for emerging technologies in Southeast Asia region. *Dr. Vibha Ahuja, Chief General Manager Biotech Consortium India Limited, New Delhi.*	
11.30-11.40 am	**Discussion**	
11.40-12.00pm	Biosafety frameworks for gene drives in Nigeria *Agha Ukpai Agha, National Biosafety Management Agency (NBMA), Nigeria.*	
12.00-12.10 pm	**Discussion**	
12.10-12.30pm	Biosafety Regulatory System for Genetic Biocontrol Products in South Africa *Thato Mogapi, Department of Forestry, Fisheries and the Environment, Cnr Steve Biko & Soutpansberg Road, 473 Steve Biko, Arcadia, Pretoria, 0083, South Africa.*	
12.30 – 13.00 pm	**Discussion**	
13.00 – 14.00 pm	Lunch	
13.00- 14.00	**POSTER SESSION**	Breakout Room 1
	Towards a Disease-free Transgenic Mouse. *Ceili Peng, Media Laboratory, Massachusetts Institute of Technology, Cambridge, MA, USA.*	
	Management of Fall Armyworm through breeding for resistance and application of biopesticides in tropical maize germplasm *Wesonga N.L, University of Ghana, West Africa Center for Crop Improvement, PMB 30, Legon-Ghana.*	
PARALLEL SESSIONS		
SESSION 3A: SCIENCE, RESEARCH, TESTING, AND ENVIRONMENTAL RELEASE OF EXPERIMENTAL GENETICALLY MODIFIED CROPS MODERATOR: NICK OGUGE		The Pavilion
14.00 -14.30 pm	Risk assessment of Bt cowpea resistant to the pod borer (Maruca vitrata) for controlled release in farming environments. *AKOUDJIN Massouroudini, Agence Nationale de Biosécurité (ANB), Ouagadougou, BP 10798, Ouagadougou, Burkina Faso.*	
14.30-14.40 pm	Effect of Stacked Transgenic Insect-pest Protected and Drought-Tolerant Maize on Stem borers and Fall Army Worm in Kenya *Murenga Mwimali, Kenya Agricultural & Livestock Research Organization (KALRO), Nairobi Kenya.*	
14.40-15.10 pm	**Discussion**	

15.10-15.20 pm	Cultivable Endophytic Bacteria Associated with Cassava Microbiome as Potential Biocontrol Agents against Crop Pathogenic Fungi. *Roselyne Nyawir Owino, Department of Biochemistry, University of Nairobi, Kenya.*	
15.20- 15.50 pm	**Discussion**	
15.50-16.20pm	Impact of Transgenic Cotton Commercialization in Kenya *Nehemiah Ngetich, National Biosafety Authority, Kenya*	
16.20-16.30 pm	**Discussions**	
SESSION 3B: REQUIREMENTS FOR SAFETY AND SECURITY DURING BIOCONTAINMENT AND TESTING OF GENETIC BICOCONTROL PRODUCTS MODERATOR: DR. LARBI BAASSI		
14.00 -14.30 pm	Requirements for analytic/research BSL-3 laboratories and ways to set-up and operate a facility in Africa in close cooperation with local structures. *Claus Schweinheim, Managing Director, HT Lab Tec GmbH, Germany.*	Breakout Room 1
14.30-14.40 pm	**Discussion**	
14.40-15.10 pm	Knowledge and Practice of Biosafety and Biosecurity amongst District Laboratory Focal personnel in Uganda. A rapid assessment during UMLTA conference. *Gordon Mpamize, Joint Clinical Research Centre, Kampala, Uganda.*	
15.10-15.20 pm	**Discussion**	
15.20- 15.50 pm	Inspection of genetically modified organisms in a confined field trial *OUEDRAOGO Arouna, Agence Nationale de Biosécurité (ANB), Ouagadougou, Burkina Faso.*	
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SESSION 4: GENE DRIVE RESEARCH, DEVELOPMENT AND APPLICATIONS MODERATOR: BRINDA DASS		The Pavilion
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9.00-9.10am	Discussion	
9.10-9.40 am	Integrating gene drives into malaria control programs *Fredros Okumu IHI Tanzania*	
9.40-9.50am	Discussion	
9.50-10.20am	Population Modification of African Malaria Mosquitoes. *Charles Mbogo, Pan African Mosquito Control Association (PAMCA).*	
10.20-10.30am	**Discussion**	

10.30-11.00am	A prototype gene drive to suppress invasive mice on islands. *Owain R Edwards, CSIRO Environment, Perth, Australia.*	
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PARALLEL SESSIONS		
SESSION 5A: MALARIA VECTOR CONTROL MODERATOR: CHARLES MBOGO		The Pavilion
11.00-11.30am	Biotechnology Product Stewardship and Access Plan for Gene Drive Mosquitoes for Malaria Control in Kenya. *Ms. Julia Njagi (National Biosafety Authority-Kenya), and Dr. Murenga Mwimali (Kenya Agricultural Livestock Research Organization).*	
11.30-11.40am	**Discussions**	
11.40-12.10	The cytochrome P450 CYP325A is a major driver of pyrethroid resistance in the major malaria vector *Anopheles funestus* in Central Africa *Amelie N.R. Wamba, Centre for Research in Infectious Diseases (CRID) & Faculty of Science, Department of Biochemistry, University of Yaound´e I, Yaound´e, Cameroon*	
12.10-12.20pm	**Discussion**	
11.20-12.10pm	Mathematical Modeling for Genetic Biocontrol: Modeling and Assessing the Effects of Adaptive Immune responses on the within-host Dynamics of Malaria Parasite. *Getachew Teshome Tilahun, Haramaya University, Department of Mathematics, Ethiopia.*	
12.10-12.20pm	**Discussion**	
12.20-12.40pm	The geographical distribution of the malaria vector ***Anopheles arabiensis*** in Cabo Verde, 2016-2023: An opportunity for new tools to control and sustain malaria elimination. *Adilson José DePINA, Instituto Nacional de Saúde Pública Cabo Verde & Programa de Eliminação do Paludismo, Ministério da Saúde, Cabo Verde.*	
12.40-13.00pm	**Discussion**	
13.00-14.00 pm	**Lunch**	
SESSION 5B: PUBLIC ENGAGEMENT AND STAKEHOLDER PARTICIPATION DURING TESTING AND COMMERCIALIZATION OF GENETIC BIOCONTROL PRODUCTS MODERATOR: VIBHA AHUJA		The Pavilion
11.00-11.30am	Insights of African stakeholders on the potential of gene drive technologies for malaria control and elimination in Africa. *Marceline (Lina) Finda, Ifakara Health Institute, Tanzania*	
11.30-11.40am	**Discussion**	

11.40-12.10	Linguistic Endeavors and Community Engagement in Genetic Engineering Research: Insights from Target Malaria's Undertakings in Burkina Faso *Nourou Barry, Institut de recherche en sciences de la sante, Bobo-Dioulasso, Burkina Faso.*	
12.10-12.20pm	**Discussion**	
11.20-12.10pm	**Tea Break**	
12.10-12.20pm	Institutional Biosafety Committee in the NMIMR: A Requirement for the Support of Efficient and Compliant Biomedical Research *Charles Quaye, Noguchi Memorial Institute for Medical Research, UG, Ghana*	
12.20-12.40pm	**Discussion**	
12.40-13.00pm	Ethics of Genetic Biocontrol: Experience from Kenya *Simon K. Langat, Protos consulting, Kenya*	
13.00-14.00 pm	**Lunch**	
SESSION 6: ONE HEALTH APPROACHES AND CONVERSATIONS TOWARDS MANAGING DISEASES IN AFRICA MODERATOR: CHARLES MBOGO		The Pavilion
14:00	African conversations on gene drives for malaria control & elimination. *Edward Okonjo, Technical university of Kenya*	
15.00	Discussions and the Way Forward on Emerging Biotechnologies.	
	CLOSING CEREMONY - CONGRESS ENDS-	

List Of Abstracts

Biosafety regulatory framework for emerging technologies in India

Dr. Vibha Ahuja, *Chief General Manager Biotech Consortium India Limited, New Delhi (vibhaahuja@biotech.co.in)*

In India, genetically modified organisms (GMOs) and products thereof are regulated under the "Rules for the manufacture, use, import, export & storage of hazardous microorganisms, genetically engineered organisms or cells, 1989" (referred to as Rules, 1989) notified under the Environment (Protection) Act, 1986. These Rules are implemented by the Ministry of Environment, Forest and Climate Change (MoEFCC), Department of Biotechnology (DBT) and State Governments though six competent authorities. There are statutory committees to regulate various stages of the development process. A series of guidelines have been issued from time to time by regulatory authorities to provide scientific guidance for research & development and biosafety evaluation of products of modern biotechnology. Guidelines issued so far focused on contained research, biologics and various aspects of genetically engineered (GE) plants viz. confined field trials, food safety assessment and environmental risk assessment.

Recently, MoEFCC has taken a decision to exempt SDN-1 and SDN-2 categories of genome edited plants that are free from exogenous introduced DNA from biosafety assessment. Guidelines and standard operating procedures for regulatory review of SDN-1 and SDN-2 genome edited plants have been notified by the Department of Biotechnology.

Taking note of research initiatives and global developments involving GE insects, "Guidelines and Standard Operating Procedures for Research on Genetically Engineered Insects, 2023" have been issued. This document is pertinent for enabling potential of genetic engineering in insect research to revolutionize the field of entomology, understanding of role of insects in ecosystems as well as their interactions with humans. These guidelines and standard operating procedures are intended to provide guidance on regulatory requirement and data requirement of genetic engineering research on insects under containment conditions.

This talk will elaborate on the abovementioned biosafety regulatory framework and evolving requirements for advancing emerging genetic technologies like gene editing and gene drives in India.

Status of biosafety regulation in Nigeria.

Agha Ukpai Agha.

National Biosafety Management Agency (NBMA), Nigeria.

National Biosafety Management Agency (NBMA) was small unit in Federal Ministry of Environment, this unit later transformed to an Agency, called National Biosafety Management Agency with NBMA ACT, 2015 to regulate Modern Biotechnology, ensuring its safety to Human health, Plants, Animals and Environment. The Agency moved into actions and worked assiduously in ensuring success in its mandate.

In August 2019, the Agency's ACT was amended to include the regulation of Gene editing, Gene drive, Synthetic biology and putting measures in place to ensure Biosecurity in Nigeria. With this law, we moved into action to develop the National Biosecurity Policy and Action Plan 2022 – 2026. Today Nigeria has produced a document we can call our own, that deals with Biosecurity issues in Nigeria, which was approved by Federal Executive Council on December 23rd, 2021. Nigeria has also developed a draft on guidelines on Gene editing and Gene drive which is still under review.

National Biosafety Management Agency, Nigeria has accredited and certified about 7 facilities in many institutions to carry out Modern Biotechnology activities. Also, NBMA has monitored and inspected 8 different Confined Field trials and 25 applications processes for CFCs and General Release, import of GM products for food, feed and processing. Training of 100 students from different universities on GMO detection and analysis using protein and DNA based methods.

Biosafety Regulatory System for Genetic Biocontrol Products in South Africa.

Thato Mogapi, *Department of Forestry, Fisheries and the Environment, Cnr Steve Biko & Soutpansberg Road, 473 Steve Biko, Arcadia, Pretoria, 0083, South Africa*

South Africa recognizes modern biotechnology as one of the technologies that can contribute to sustainable development through the range of tools it offers to various sectors of the economy including agriculture and health. The genetic modification technology has been adopted in South Africa since the early 1990s. South Africa has a dynamic regulatory regime governing various aspects of the development, production, use and application of genetically modified organisms (GMOs), which encompasses science-based risk assessments, risk management including post-market monitoring as well as socio-economic considerations. The regulatory framework provides an enabling environment for harnessing the benefits of the technology sustainably while ensuring that risks posed by GMOs are kept at an acceptable level that will not result in adverse effects to the environment and human health.

Towards a Disease-free Transgenic Mouse

Ceili Peng[1], Kevin Esvelt[1]

[1]Media Laboratory, Massachusetts Institute of Technology, Cambridge, MA, USA

Background: Mouse research colonies and breeding facilities require large numbers of animals to be housed in close quarters, leaving them vulnerable to disease that can ruin experiments and waste money. We aim to create transgenic mice that contain a genetically encoded, heritable immunity to common mouse viruses.

Methods: We are developing a Cas12 array that targets common mouse RNA viruses such as mouse hepatitis virus (MHV) and Sendai virus (SeV). Cas12 contains an endogenous processing system, but different array splicing techniques such as ribozymes, endogenous tRNAs, and Csy4 are also being validated.

Results: We are currently studying this system in vitro and then we will be moving to a mouse model using transgenic mice. We will perform challenging experiments against these mice to determine survival and virulence. Results are being gathered over the next few months, and we will have significant preliminary data by the end of this summer.

Conclusion: So far, we have had promising results when testing our system in vitro. When co-transfected into cells, our system knocks down viral genome replication. With further work, this technology could be a viable method for disease mitigation.

Management of Fall Armyworm through breeding for resistance and application of biopesticides in tropical maize germplasm

Wesonga N.L.[1] and Murenga M.[2]

[1]PhD student, University of Ghana, West Africa Center for Crop Improvement, PMB 30, Legon-Ghana, E-mail: nlwesonga@wacci.ug.edu.gh

[2]Kenya Agricultural and Livestock Research Organisation, Post Office: P.O. Box 57811, 00200, City Square, Nairobi, Kenya. Email: mwimali@yahoo.co.uk

Maize fields in Kenya experience up to 100% fall armyworm infestation, an estimated annual yield loss of about 1381kg ha^{-1} (47%) has been attributed to the pest. Most smallholder maize farmers rely on labor intensive cultural management approaches and chemical pesticides for fall armyworm control. Management of fall armyworm through host plant resistance and application of biopesticides will provide sustainable, economic and environmentally friendly management technique for farmers. This includes the use of parasitoids, predators, nematodes, fungi, bacteria, protozoa, and viruses and controls pests through non-toxic mechanisms. A study was carried out under controlled field trials in KALRO Kiboko, Kakamega and Embu to determine the efficacy of biopesticides in fall armyworm control in maize. Evaluation for biopesticides performance was carried out with 6 treatments (***Beauveria bassiana***, ***Metarhizium anisopliae***, ***Bacillus thuringiensis***, T4 ***Nomuraea rileyi***, ***Verticillium lecanii*** and a control). Susceptible maize genotype was planted in a 6.0 x 3.6 m plot at an inter-row spacing of 0.75m and inter-hills spacing of 0.25m in a Randomized Block Design (RBD) in 3 replications. The first spray was applied immediately after artificial infestation of the maize with fall armyworm. Repeated consecutive second and third spraying was carried out at an interval of 10 days after the first spay. There were significant differences ($p \leq 0.05$) in efficacy levels among the biopesticides. The lowest fall armyworm plant damage (score=2) was observed in plots treated with biopesticide across all the 4 sites. This shows that biopesticide I was the most stable and most effective compared to II, III, IV and V. Biopesticide IV had the lowest fall armyworm damage score (= 2) in Kiboko, however, it had the highest score (= 6) in Kakamega, Embu, and Busia. Biopesticide IV may be recommended for use in Kiboko. There were significant differences ($p \leq 0.05$) in efficacy levels among the biopesticides II. III. and IV across the difference sites, suggesting that their efficacy and stability might have been affected by environmental interaction. Kenya has high number of registered biopesticides however, there is low demand from farmers due to concerns over low efficacy. From the study, it can be concluded that biopesticides with proven efficacy can be identified and promoted for use by farmers in the management of fall armyworm.

Key words: Fall armyworm; Biopesticides; Management, Maize.

Risk assessment of Bt cowpea resistant to the pod borer (Maruca vitrata) for controlled release in farming environments

AKOUDJIN Massouroudini[1*], SANON Zezouma[1], RABO Mounyratou[1], KY Oumarou[2], SAWADOGO Louis[3], TRAORE Oumar[1]

[1]Agence Nationale de Biosécurité (ANB), Ouagadougou, BP 10798, Ouagadougou, Burkina Faso.

[2]Agence Burkinabé de Normalisation, de la Métrologie et de la Qualité (ABNORM), BP 19, Ouagadougou, Burkina Faso.

[3]Institut de l'Environnement et de Recherches Agricoles (INERA), Centre National de la Recherche Scientifique et Technologique (CNRST), BP 476, Ouagadougou, Burkina Faso.

Cowpea (***Vigna unguiculata*** (L) Walp) is the most important grain legume in the West African farming systems. It contributes to human and animal food. More than 80% of the world's production (27,715,0237 tonnes) of cowpea in 2021 was produced in West Africa. Burkina Faso is the third largest cowpea producer after Nigeria and Niger. Insects are a major constraint to cowpea production. Among these insects, the pod borer, ***Maruca vitrata*** (Fabricius), is one of the most serious pests of cowpea in this region, with yield losses of 20–80%. To fight against this, cowpea has been transformed via the expression of the Cry1Ab gene from Bacillus thuringiensis (Bt) and nptII gene from Escherichia coli as a selection marker. Bt Cowpea is a GMO it must be evaluated before any use, so a risk assessment has been made in accordance with regulatory texts. Thus, it is necessary to identify the potential risks, estimate the probability of the occurrence of the risk; estimate the seriousness of potentially harmful effects, and estimate the overall level of risk. Six major risks were identified: (i) toxicity on non-target organisms, (ii) Transfer of the Bt and nptII genes to the non-target organisms, (iii) Invasiveness or persistence of Bt cowpea in the environment, (iv) Development of resistance to the Bt protein by Maruca vitrata, (v) Transfer of the Bt and nptII genes to related species and crops, (vi) Horizontal transfer of the nptII gene to soil bacteria. The likelihood of all risks occurring was highly unlikely. The level of individual risk was negligible as well as the overall level of risk of bt cowpea for controlled dissemination in the farming environment is negligible. For decision-making, it was recommended to authorize control release and to sensitize farmers to the importance of refuge areas.

Effect of Stacked Transgenic Insect-pest Protected and Drought-Tolerant Maize on Stem borers and Fall Army Worm in Kenya.

[1]Murenga Mwimali, [2]Anani Bruce, [1]Regina Tende, [1]Dickson Ligeyo, [2]Stephen Mugo, [2]Yoseph Beyene, and [3]Francis Nang'ayo

[1]Kenya Agricultural & Livestock Research Organization (KALRO) P.O. Box 57811, Nairobi Kenya; [2]International Maize and Wheat Improvement Center (CIMMYT), P.O. Box 1041-0062 Nairobi, Kenya, [3]The African Agricultural Technology Foundation (AATF) P.O. Box 30709. Nairobi 00100. Kenya.

The Water Efficient Maize for Africa (WEMA) aims at increasing grain yields by 20-35% under moderate drought and reducing yield losses due to stem borers. A drought tolerance (DT) gene and an insect-protected gene for stem borer control were introduced into elite maize germplasm. The WEMA partners developed two confined field trial (CFT) land at KALRO Kiboko and Kitale respectively. Seven sets of ***isogenic*** hybrids differing only in the presence or absence of the respective ***Bt*** and DT transgenes were grown at the CFT sites. The hybrids were artificially infested with 20 neonates of ***Chilo partellus*** and ***Busseola fusca*** at Kiboko and Kitale respectively. An unexpected fall armyworm ***Spodoptera frugiperda*** became the main pests from its natural infestation about 2-3 weeks after planting at each location. Leaf damage was observed from compounding of stem borers and FAW at both locations. At Kitale, the leaf damage scores varied from 1.1 to 1.2 for Bt event and 4.9 to 7.5 for non ***Bt isogenic*** hybrids. The same trend was observed at Kiboko where leaf damage score varied from 2.9 to 3.5 for ***Bt*** events and 7.0 to 7.9 for non-***Bt isogenic*** hybrids. These results indicated that the transgenic events (DT-***Bt***) significantly controlled both ***C. partellus*** and ***B. fusca*** as well as the FAW.

Keywords: Stacked transgenic maize; ***Chilo partellus***; ***Busseola fusca; Spodoptera frugiperda;*** confined field trials

Cultivable Endophytic Bacteria Associated with Cassava Microbiome as Potential Biocontrol Agents against Crop Pathogenic Fungi

Roselyne Nyawir Owino1*, Edward K. Nguu1, Evans N. Nyaboga1

[1]Department of Biochemistry, University of Nairobi, P.O Box 30197 - 00100, Nairobi, Kenya

Background: The indiscriminate use of chemical fungicides increasingly harms the health of living beings and the environment. The use of microbial-based biological control agents to control plant pathogens has gained prominence, since it consists of an environmentally friendly alternative to the use of synthetic agrochemicals. Herein, we evaluated the potential role of endophytic bacteria from cassava as biological control agents of crop pathogenic fungi.

Methods: Eighty four (84) endophytic bacteria were isolated from leaves, stems and petioles of four cassava cultivars obtained from Kabete field station, University of Nairobi. The 84 isolates were used to assess the antagonistic activity by in vitro confrontation bioassay (dual culture) against plant pathogens Colletotrichum siamense, Colletotrichum sublineola and Phytophthora infestans isolated from cassava, sorghum and potato, respectively. Endophytic bacteria strains with fungal growth inhibition were selected for morphological, physiological and biochemical identification, and molecular characterization by 16S rDNA and phylogenetic analysis.

Results: Fourteen endophytic bacteria strains demonstrated inhibitory activity on pathogen mycelia growth with percent inhibition ranging from 23.3 – 80% against C. siamense, 27.7 – 64.8% against C. sublineola and 24.3 – 82.4% against P. infestans, respectively. The strains also exhibited tolerance to salt and osmotic stress. Molecular characterization and phylogenetic analysis showed that the endophytic bacterial isolates are closely related to Bacillus subtilis, B. altitudinis, B. vezelensis, B. safensis, B. cerus, B. amyloliquefaciens and Staphylococcus saprophyticus, with an identity score above 99%.

Conclusion: The results highlight the biocontrol potential of bacterial endophytes isolated from cassava against crop pathogenic fungi, providing support for ongoing research on disease control in agriculture using environmentally friendly approaches.

Impact of Transgenic Cotton Commercialization in Kenya

Eric Korir[1] and Nehemiah Ngetich[1]

[1]National Biosafety Authority, P.O Box 28251-00100, Nairobi, Kenya.

Corresponding Author: nngetich@biosafetykenya.go.ke

In the 2018 and 2019 budget policy statements, the Government undertook to support the textile industry by developing and commercializing cotton hybrids and Bacillus thuringiensis (Bt) cotton, which protects itself against caterpillar pests, specifically the African Bollworm, which, if not managed, can cause up to 100% yield loss. Research conducted locally by the Kenya Agricultural and Livestock Research Organization has demonstrated that Bt-cotton hybrids yield about two times more than current conventional varieties under rain-fed and irrigation conditions. Bt-Cotton has undergone a safety assessment by the National Biosafety Authority (NBA) and is determined to be as safe as the non-Bt-Cotton, thus the basis for approval for commercialization. The NBA has established a full-capacity laboratory to carry out the screening and testing of the technology. National performance trials showed that Bt-cotton hybrids were superior to our local varieties in African Bollworm attack resistance, yield, and fibre qualities. Kenya commercialized Bt-cotton in 2020. This promoted the manufacturing pillar of the Big Four Agenda, certified

quality seed, increased cotton production, employment opportunities, reduced pesticide application, and increased exports of Kenyan cotton and its products. Moreover, Bt-cotton increased the utilization of cotton lint, cotton seed oil, and seed cake along the value chain and improved competitiveness for Kenyan farmers through the adoption of modern technologies in agricultural production to address food security and manufacturing challenges. Kenya has regained its status as the primary driver of the Agricultural Transformation Strategy in East Africa by adopting innovative technologies. One of the challenges with Bt cotton is a stable seed supply system. However, the Ministry of Agriculture is working to address this bottleneck.

Keywords: African bollworm, Bt cotton, commercialization

Requirements for analytic/research BSL-3 laboratories and ways to set-up and operate a facility in Africa in close cooperation with local structures.

Claus Schweinheim

Managing Director, HT Lab Tec GmbH, Germany

For 60 years, the HT company has been synonymous with innovation, unique product and service quality, flexibility and international partnership for building modular room systems in the fields of health, care and research. The close co-operation with clients, architects and medical planners as well as our many years of project planning experience and our own production are the essential factors for completing construction projects in more than 50 countries worldwide successfully. Actual infectious diseases such as Corona, Ebola, Marburg, SARS, Merv, bird flu, swine flu, tuberculosis, etc. are an increasing danger. In order to be better prepared for such threatening situations, additional laboratories for diagnostics, research and treatment must be set up. No matter what type of laboratory it is, BSL- 3 or BSL-4 HT Group is a competent partner for setting up multifunctional laboratories.

New BSL-3 projects are mostly retrofits in the inventory. For the operator, this retrofitting usually presents a great challenge. Many projects fail already in the design phase, or the partially constructed laboratory could not be put into operation, because during the commissioning phase, the non-conformity according to the regulations is determined and a further retrofitting makes no longer sense. It is important in the early design phase to agree on which requirements should be met later and which regulations should be used. Particularly in the field of BSL-3 laboratories, a broad, non-uniform set of rules is available here. The planning can usefully be done in a modular design, so that regardless of the existing building structure of a fully functional containment can be built that flexible meets various requirements, e.g. tightness, fire protection, hygiene, sound insulation and functionality. Care must be taken to ensure that the chosen modular design easily enables subsequent modifications to required retrofits without blocking the use of the BSL-3 laboratory with extensive new construction measures.

Another topic of the presentation is the fast-track-building of turn-key-laboratories using prefabricated materials. It should highlight how nowadays African countries could work and maintain in a safe manner such a facility and realize valuable operation regarding national interest. This should also include a qualified training for people working inside the lab., and also the technical team to maintain safe operation. The existing excellent local qualifications are to be further developed in a targeted manner so that national organizations in Africa can operate laboratories independently from any outside support. Design and building topics should have a focus on local content, such as modular building shell using local timber frame construction. Robust and simple technical facility engineering solutions to maintain dynamic containments.

This presentation highlights international regulations and shows various requirements based on the Canadian regulations. Particular attention is paid to the various requirements for tightness and the consequences of a specific determination. By presenting the assemblies for a laboratory, modularity is made transparent and access to complex commissioning is created.

Knowledge and Practice of Biosafety and Biosecurity amongst District Laboratory Focal personnel in Uganda. A rapid assessment during UMLTA conference.

Gordon Mpamize, Andrew Baguma, Okwalinga Paul, Benson Musinguzi, Raymond Mugabe, Nkodyo Patrick.

Joint Clinical Research Centre, Kampala.

Background: Biosafety and Biosecurity (BSBS) discipline emphasizes the safe handling and containment of infectious microorganisms and hazardous biological materials. Biomedical laboratory personnel deal with these materials regularly during clinical diagnosis and research. However, BSBS knowledge and practice among these laboratory workers is an important aspect that needs to be regularly evaluated. The study aimed at illuminating awareness and practices of BSBS amongst clinical laboratory leadership at District level in Uganda.

Material and Methods: This was a cross-sectional study conducted among the District laboratory focal personnel (DLFPs) in Uganda, on 24th -27th February 2022 during 39th UMLTA conference that took place at Ikoro Hotel in Kisoro District. Data were collected using a pre – training test distributed physically.

Results: In this study 67 DLFPs from whole of Uganda were involved. Accordingly, in knowledge, 2.3 % (n = 2) of study of the respondents scored good, 5.7% (n = 5) scored satisfactory, 23.0% (n = 20) and 69.0% (n = 60) had sufficient and insufficient scores respectively. For practice, 94.3% (n = 82) of respondents had insufficient score while 5.7% (n = 5) were sufficient.

Conclusion: BSBS knowledge and practice among DLFPs was universally unsatisfactory, indicating a weak commitment towards the subject matter. This underlines the need to strengthen Biorisk management program and policies particularly among DLFPs.

Keywords: Biosafety and Biosecurity, District Laboratory Focal Personnel

Inspection of genetically modified organisms in a confined field trial

OUEDRAOGO Arouna[1], RABO Mounyratou[1], ROUAMBA W Mathurin[1], AKOUDJIN Massouroudini[1]

[1]Agence Nationale de Biosécurité (ANB), Ouagadougou, BP 10798, Ouagadougou, Burkina Faso

Faced with the multiple challenges of development, biotechnologies appear as an opportunity for African countries. Burkina Faso has adopted genetically modified organisms, but this must be done in accordance with the regulations. Thus, for safe use, inspections must be carried out after an authorization has been issued. The purpose of inspections is to verify biosafety measures. To do this, a preparatory phase consists of establishing the checklists of inspection. There are two types of inspections, namely scheduled inspections and unscheduled inspections. Those scheduled include cross-border inspections, inspections of facilities and experimental sites; inspections of the experimental protocol, inspections of the experimental records, and inspections of the destruction of residues. Once in the field, the inspector explains the work method and rolls out his checklist while checking aspects such as safety measures, the experimental device, residue management, and waste disposal. From 2012 to 2023, there have been 125 inspections including 120 scheduled inspections and 5 unannounced inspections. Inspections of the facilities and the experimental protocol represent 80% of the inspections because they make it possible to ensure compliance with biosafety measures and the conditions of the authorization. These inspections concerned the following speculations: Bt cotton, Bt cowpea, Bt maize, genetically modified mosquitoes, and editing rice. During these inspections, we noted 15 cases of non-compliance with containment measures, in particular the height of the fences of the confined fields. The inspections made it possible to correct situations of non-compliance, to prevent GMO products from accidentally released into the environment.

Application of the SIT against the Primary Vector Anopheles arabiensis in South Africa

Givemore Munhenga, Thabo Mashatola, Leonard C Dandalo, Pinky Manana, Dumsani Dlamini, Nondumiso Mabaso, Michael Samuel, Nonhlahla Ntoyi, Leanne N Lobb, Oliver R Wood, Power Tshikae, Eunice Jamesboy, Windy Sekgele, Witness Ramashia, Malibongwe Zulu, Basil D Brooke, Maria Kaiser and Lizette L Koekemoer.

Background: South Africa has begun initiatives to eliminate malaria transmission within its borders Some malaria affected districts meet the World Health Organization (WHO) criteria for pre-elimination, requiring control initiatives to be shifted towards elimination. Although effective, current malaria control activities, particularly vector control intervention using indoor residual spraying (IRS), are insufficient to eliminate malaria. Against this background, additional vector control interventions are needed to supplement existing strategies. The use of the sterile insect technique (SIT) was proposed and is under investigation

Methods: SIT is being implemented in three sequential phases. Phase I was the pre-feasibility Phase which aimed to provide scientific arguments and baseline information for using the SIT as a complementary malaria vector control strategy. This phase included identifying a pilot release site and intensive baseline entomological surveillance at the release and control sites. Phase II involved refinement of Phase I findings and the development of a genetic sexing strain, irradiation/sterilization studies, community engagement including knowledge, attitude and practices (KAP) survey, development of the capacity to mass rear mosquitoes and assessing technical feasibility of the technology. The project is now in Phase III. This Phase aims to demonstrate the operational applicability of SIT through field pilot trials in northern KZN, South Africa.

Results: The project was able to optimise mosquito mass-rearing and transportation procedures resulting in a consistent sterile male field releases over 9 months' period. Preliminary results showed that the released sterile males were competitive as they induced sterility in the wild population. There is a marked decline in the An. Arabiensis population density in the intervention arm compared to control clusters.

Discussion: In conclusion this study demonstrated that SIT is effective in reducing the natural vector population size. Early community engagement ensured full community participation resulting in better uptake of sterile male releases. The next step is to determine the public health value of the technology through a cluster randomized control trials (cRCTs).

Integrating gene drive modified mosquitoes in malaria control programs in Africa

Fredros Okumu, Ifakara Health Institute, Tanzania

This presentation will explore key aspects of integrating gene drive modified mosquitoes into malaria control programs in Africa. We will discuss various questions that need to be addressed in order to successfully integrate this new technology, including the optimal implementation strategies, the impact of GM mosquitoes on other interventions, and the potential for this technology to reduce the burden of malaria in different epidemiological settings. The presentation will be divided into three main parts: introduction to gene drive mosquitoes, challenges and opportunities of using gene drive mosquitoes for control or elimination, and essential needs for monitoring the deployments. The presentation will conclude with a discussion of the future of gene drive mosquitoes in malaria control.

A prototype gene drive to suppress invasive mice on islands.

Owain R Edwards[1*], Luke Gierus[2], Aysegul Birand[2], Paul Q Thomas[2]

[1]CSIRO Environment, Perth, Australia

[2]University of Adelaide, Adelaide, Australia

Invasive rodents are a major cause of environmental damage and biodiversity loss, particularly on islands. Population-suppressing gene drives with biased inheritance have not previously been developed in any vertebrate system. We have recently developed a mouse gene drive prototype (t CRISPR) that leverages super- Mendelian transmission of the t haplotype to spread inactivating mutations in a haplosufficient female fertility gene (Prl). Spatially explicit individual-based in silico modeling shows that t CRISPR can eradicate island populations under a range of realistic field-based parameter values. We also engineer transgenic t CRISPR mice that, crucially, exhibit biased transmission of the modified t haplotype and Prl mutations at levels our modeling predicts would be sufficient for eradication. Our next step is to develop a proof-of-concept laboratory mouse that targets a gene carrying a sequence variant that is locally fixed within a target island population but is found only at low to intermediate frequencies in non-target populations. We are also discussing with Australian regulators strategies for testing such a prototype mouse first in laboratory cages, then in contained field pens, to determine whether it behaves as predicted under semi-field conditions.

Key words: mouse, gene drive, genetic control, locally fixed alleles.

The cytochrome P450 CYP325A is a major driver of pyrethroid resistance in the major malaria vector Anopheles funestus in Central Africa

Amelie N.R. Wamba [a b], Sulaiman S. Ibrahim [c d], Michael O. Kusimo [a], Abdullahi Muhammad [c g], Leon M.J. Mugenzi [a f], Helen Irving [c], Murielle J. Wondji [a c], Jack Hearn [c], Jude D. Bigoga [c e], Charles S. Wondji [a c]

[a] *Centre for Research in Infectious Diseases (CRID), P.O. BOX 13591, Yaound´e, Cameroon*

[b] *Faculty of Science, Department of Biochemistry, University of Yaound´e I, P.O. Box 812, Yaound´e, Cameroon*

[c] *Vector Biology Department, Liverpool School of Tropical Medicine (LSTM), Pembroke Place, Liverpool, L3 5QA, UK*

[d] *Department of Biochemistry, Bayero University, PMB, 3011, Kano, Nigeria*

[e] *Laboratory for Vector Biology and Control, National Reference Unit for Vector Control, The Biotechnology Centre, Nkolbisson – University of Yaound´e I, P.O. Box 3851, Messa, Yaound´e, Cameroon*

[f] *Department of Biochemistry and Molecular Biology, Faculty of Science, University of Buea, P.O. Box 63, Buea, Cameroon*

[g] *Centre for Biotechnology Research, Bayero University, Kano, PMB, 3011, Kano Nigeria.*

Background: Malaria is the leading cause of death for children in sub-Saharan Africa with major malaria vectors like *An. funestus* developing metabolic resistance to insecticides. There is the need to understand the underlying biochemical mechanisms.

Methods: RNAseq-based transcription analyses revealed elevated expression of CYP325A specific to Central African *An funestus*. Insecticidal tests confirmed high resistance to pyrethroid while synergist tests with PBO implicated P450s. CYP325A cDNA and 1kb putative promoter were amplified for molecular characterization. Candidate alleles were functionally validated through *in silico* predictions of homology modelling and molecular docking simulations, *in vitro* through heterologous expression in *E. coli* for enzyme kinetic studies and depletion assays.

Results: Polymorphisms analyses revealed absence of selective sweep signatures around CYP325A and ongoing directional selection in promoter. E331Q SNP mutation was observed in Cameroon at 94% allelic frequency compared to 12% in DRC indicating directional selection. ***In silico*** predicted CYP325A binds and metabolises type I and type II pyrethroids. Heterologous expression of recombinant CYP325A and metabolic assays confirmed that the most-common Cameroonian haplotype metabolises both type I and type II pyrethroids with depletion rate twice that the of the DR Congo haplotype. Analysis of 1 kb putative promoter of CYP325A revealed reduced diversity in resistant mosquitoes compared to susceptible ones, suggesting a potential selective sweep in this region.

Conclusions: The establishment of CYP325A as a pyrethroid resistance metabolising gene further explains pyrethroid resistance in Central African populations of ***An. funestus***. Our work will facilitate future efforts to detect the causative resistance markers in the promoter region of CYP325A to design field applicable DNA-based diagnostic tools and inform policy through scientific evidence.

Keywords: *Anopheles funestus*, malaria, pyrethroids, metabolic resistance, Cytochrome P450-CYP325A, Central Africa

Modeling and Assessing the Effects of Adaptive Immune responses on the within-host Dynamics of Malaria Parasite.

Getachew Teshome Tilahun (Ph. D)

Haramaya University, Department of Mathematics, Ethiopia Email: gmgech@gmail.com

In this study, we developed a blood-stage mathematical model of the malaria parasite with adaptive immune response. The model includes instructions for six cell populations. We investigate the qualitative analysis of the developed model. The parasite-free equilibrium is both locally and globally asymptotically stable if the basic reproduction number, $0<1$. If $0>1$, there exist four parasite-persistence equilibria: parasite-persistence equilibrium without adaptive immune response (cytotoxic T-cells and antibodies), parasite-persistence equilibrium with cytotoxic T-cells response, parasite-persistence equilibrium with antibodies response, and parasite-persistence equilibrium with adaptive immune response (cytotoxic Tcells and antibodies). The conditions for the existence and stability of these equilibria are investigated. The sensitivity analysis of the basic reproduction number is provided, and the recruitment rate of uninfected red blood cells from bone marrow, infection rate of the red blood cells by merozoites and the average number of merozoites per ruptured infected red blood cell are the most sensitive parameters in the control of the withinhost infection of malaria parasite. To supplement the theoretical and analytical results different numerical simulations are done.

Key words: Modeling; Within-host; malaria; cell level.

Insights of African stakeholders on the potential of gene drive technologies for malaria control and elimination in Africa

Marceline F. Finda[1*], Elijah Juma[2], Najat F. Kahamba[1], Rhosheen Mthawanji[3], Maganga Sambo[1], Basiliana Emidi[4], Susan Weiner[5], David O'Brochta[5], Michael Santos[5], Stephanie James[5], Fredros O, Okumu[1,6,7,8]

[1]*Ifakara Health Institute, Tanzania*

[2]*Pan African Mosquito Control Association, Nairobi, Kenya*

[3]*Malawi Liverpool Wellcome Programme, Malawi*

[4]*National Institute for Medical Research, Tanzania*

[5]*Foundation for the National Institute of Health, USA*

[6]*Nelson Mandela African Institution of Science and Technology, Tanzania*

[7]*University of Glasgow, Glasgow, United Kingdom;*

[8]*University of the Witwatersrand, South Africa*

Background: Gene drive technologies have the potential to solve some of Africa's most pressing problems with malaria control and elimination. However, the development of gene drives modified mosquitoes (GDMMs) for malaria control has mostly been driven by the global north, with limited involvement from African stakeholders. Adequate involvement of African stakeholders is crucial in ensuring successful research and implementation of GDMMs. This study explored the insight and recommendations of key African stakeholders regarding the potential of GDMMs for malaria control and elimination in Africa

Methods: This was a concurrent mixed-methods study that involved in-depth discussions and structured with key stakeholders across 25 countries in sub-Saharan Africa. The stakeholders represented academic, research and regulatory institutions, as well as ministries of health and media and advocacy groups.

Results: Despite high awareness of GDMMs among the key stakeholders, there was a relatively low knowledge of how GDMMs work in malaria control. However, when provided with an explanation about GDMMs during the in-depth discussion sessions, the study participants offered a set of recommendations to ensure successful research and implementation of GDMMs for malaria control in Africa. These recommendations included the establishment of technical expertise within Africa, generating local evidence regarding the safety, applicability, and effectiveness of GDMMs, and establishment of country-specific regulatory frameworks for safe and effective governance of GDMMs.

Conclusion: This study presents insights from some of the most important stakeholders in Africa on some of the most pressing issues that must be resolved, and recommendations for addressing them. These findings are crucial for instilling confidence among stakeholders regarding the effectiveness of GDMMs in tackling malaria challenges in Africa. Findings can be used to develop product profiles for GDMMs tailored into African context.

Linguistic Endeavors and Community Engagement in Genetic Engineering Research: Insights from Target Malaria's Undertakings in Burkina Faso

Nourou Barry[1], Lea Pare Toe[1], Anselme D. Ky[1], Wilfried I. Meda[1], Korotimi Bayala[1], Jean W. Birba[1], Souleymane Kekele[1], Mouhamed Drabo[2], Delphine Thizy[2], Abdoulaye Diabate[1]

[1]*Institut de recherche en sciences de la sante, Bobo-Dioulasso, Burkina Faso*

[2]*Department of Life Sciences, Imperial College London, London, UK*

Background: Effective stakeholder engagement is crucial for developing innovative public health interventions, including genetic approaches for malaria control. However, the lack of scientific terminology in local languages hinders collaboration with international partners. This work summarizes Target Malaria's linguistic work in Burkina Faso, focusing on timing, translation complexity, language consistency, community inputs, and glossary utilization.

Methods: The research was conducted in Burkina Faso. Early engagement presented linguistic challenges as the expression used to explain the sterility of genetically modified mosquitoes alluded to castration, leading to misunderstandings among community members. The linguistic work aimed to address these misconceptions and improve clarity through continuous engagement and re-explanation. The translation process involved finding consensus on each translation through dialogue and description of underlying concepts rather than direct word translation. The linguistic work emphasized community inputs, with focus group discussions and feedback sessions used to derive appropriate translations and propose alternatives.

Results: The glossary of terms was finalized and used to train team members, ensuring consistency in communication. Having a standardized glossary helped improve engagement, as teams could rely on tested terminology to explain complex scientific concepts. The glossaries were also used in subsequent communication tools, such as animated videos, ensuring consistency in messaging and increasing understanding.

Conclusions: The stepwise process revealed the complexity and importance of elaborating a common language with communities as well as the imbrication of language with cultural aspects. This exercise demonstrated the strength of a co-development approach with communities and language experts as a way to develop knowledge together and to tailor communication to the audience even in the language used.

Key words: Stakeholder engagement; Genetic approaches; Linguistic work; Translation process; Community inputs; Standardized glossary.

Institutional Biosafety Committee in the NMIMR: A Requirement for the Support of Efficient and Compliant Biomedical Research

Charles Quaye[1,2] and Joseph H K Bonney[3,4]

[1]Department of Parasitology, Noguchi Memorial Institute for Medical Research, UG, Ghana

[2]Safety Office, Noguchi Memorial Institute for Medical Research, UG, Ghana

[3]Department of Virology, Noguchi Memorial Institute for Medical Research, UG, Ghana

[4]Health and Safety Committee, Noguchi Memorial Institute for Medical Research, UG, Ghana

The Noguchi Memorial Institute for Medical Research (NMIMR) remains the largest and most advance biomedical research facility in the West African sub-region. Its core mandate involves biomedical research into diseases of public health importance, training and high-end disease diagnosis support for public health programmes and emergencies. The Institute management have always taken steps to protect staff, samples, study subjects and the environment in the performance of its activities. The NMIMR in the early 2000 took steps to consolidate its research processes with the establishment of the Office of Research Support, a Federal wide Assurance (FWA) recognized Institutional Review Board (IRB) and an Institutional Animal Care and Use Committee (IACUC). This became vital on account of the rising need for planned and documented control processes for the use of human subjects and animals in research. The institute further established an Institutional Health and Safety Committee and a Safety Office with the responsibility of assessing, planning, providing guidelines and monitoring biosafety and biosecurity related activities in the Institute. The need for Institutional Biosafety Committee (IBC) is imminent especially with its role in research and diagnosis. IBCs are responsible for establishing guidelines and implementing practices that ensure safe usage of all infectious and dual-use agents, recombinant or synthetic nucleic acids and biological toxins. The NMIMR is currently in the process of establishing an IBC with the support from the National Biosafety Authority of Ghana. Our IBC will be responsible for reviewing all gene-drive-oriented experiments requiring IRB or IACUC approval in the NMIMR and will support other organizations such as the research departments in the University of Ghana. This will include studies that involve human and non-human primate blood, body fluids, tissues and primary or established cell lines, pathogens, microorganisms and recombinant or synthetic DNA.

Ethics of Genetic Biocontrol: Experience from Kenya

Simon K. Langat, Protos Consulting, Kenya

E-mail: simon.langat@protosconsulting.org

Biological control of pests and parasites has developed side by side alongside agriculture and livestock production for centuries. It developed and changed with the prevailing technology available for farming communities throughout history. Arrival of any new technology has always been accompanied by ethical questions that have been dealt with by the contemporaries of the era. Kenya today grapples with current dilemmas defined by the culture, the technology, and the evolving legal environment besides climate change.

This presentation looks at the ethical issues that define the debate on the use of biocontrol in the country. We find that there are three major strictures that we must examine for us to accept biocontrol within Kenya as ethical. These are the social, the ecological and the economic implications. Once these have been addressed, we then determine the policy rendezvous that the country ought to get to while trying to create an equilibrium for business including farming, research, and environmental conservation to thrive.

Social implications tell us how the people think, their fears aspirations and hope. Ecological implications guide us to the horrors the country may face if no precaution is taken. The economic explain the balance needed to establish local activity and reduce reliance on foreign technology and promote business.

In conclusion we argue for a harmonious approach where government should develop the capacity to lead in this vital area, while science should focus on the local questions that need answers.

African Conversations on Gene Drives for Malaria Control & Elimination

Edward Okonjo[1], Marceline (Lina) Finda[2], Fredros Okumu[2]

[1]Technical University of Kenya

[2]Ifakara Health Institute, Tanzania

Background: The need for novel alternative technologies for malaria control and elimination is increasingly being considered to accelerate malaria elimination efforts in sub-Saharan Africa. Technologies such as gene drives have been demonstrated in the proof-of-concept studies as promising new tools that might be deployed as a component of the Integrated Vector Management System in the renewed drive for malaria elimination. There is a need to start critical conversations with key stakeholders in the malaria control landscape in sub-Saharan Africa (SSA) on the safe and responsible use of the technologies. There is limited knowledge and awareness about these alternative technologies among key stakeholders. The study's overall objective aim is to advance the stakeholder conversations about gene drives for malaria control in Kenya by obtaining an in-depth analysis of the specific needs, expectations, and opportunities.

Methodology: This study will be qualitative and will employ focus group discussions (FGDs) and questionnaires with identified key stakeholders of malaria control and elimination in the country. A structured survey will be administered in person using open data kit (ODK) software on electronic tablets. In-depth interviews and FGDs will be audio-recorded and transcribed immediately following the discussions.

Results: Preliminary data from the conducted FGDs indicate that the majority of the stakeholders agreed that Gene Drive strategy fits within the IVM targeting malaria, other MBDs, and neglected diseases. The technology is best used as a supplementary rather than core technology. Tailoring it to the country's situation and needs is also important. Initial evidence from other African countries can be used to make decisions during development. Additionally, there is a need to use different approaches in different places, where they may be suited best, based on evidence. Ultimately there are still many factors to examine in the country, including effectiveness and safety before implementation.

Keywords: Malaria, Genedrive, Mosquito

The African Genetic Biocontrol Consortium

10D, Sifa Towers, Lenana/Cotton Avenue Junction, Nairobi Locate us
Phone: +254 020 205 4451 | +254 719 283 353
Email: info@genbioconsortium.africa | Website: www.genbioconsortium.africa