



2nd Global Genetic Biocontrol Congress

2nd Global Congress On Genetic Biocontrol Technologies

March 17-20, 2025, Alisa Hotel North Ridge, in Accra, Ghana

Theme: Harnessing genetic biocontrol potential solutions in a changing climate

Organized by: African Genetic Biocontrol Consortium in collaboration with National Biosafety Authority in Ghana



In Partnership with



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Welcome address



Hon Ibrahim Murtala Muhammed,

*Minister of Environment, Science and Technology,
Republic of Ghana*

Esteemed experts

Ladies and Gentlemen

I am honored to welcome you all to the 2nd Global Congress on Genetic Biocontrol Technologies held here in Accra, Ghana. This collaborative effort between the African Genetic Biocontrol Consortium and Ghana's National Biosafety Authority represents a crucial step forward in our shared commitment in Ghana to advancing biosafety and regulatory frameworks for emerging biotechnologies.

As Ghana, this Congress will enable us the scientific community and other stakeholders in our country to identify specific capacity-building needs and explore strategies to address them within the evolving regulatory landscape, both regionally and internationally. Our focus remains steadfast on fostering informed and transparent decision-making processes that support the responsible development and deployment of genetic biocontrol agents or products.

I reaffirm my Ministry's unwavering support for the Ghana National Biosafety Authority and its partners in providing leadership, exceptional services and guidance on emerging technologies. Let us work together to ensure that our regulatory frameworks are robust, adaptable, and aligned with global best practices.

I do warmly welcome you all to Accra, Ghana and we do hope you will find time to visit some of the attractive places in Ghana.

AKWAABA



Dr Misheck Mulumba,
Congress President

It is my pleasure to present to you the 2nd Global Congress on New and Emerging Genetic Biocontrol Technologies.

The African Genetic Biocontrol Consortium has been established as an agreement among member organizations committed to contribute and to expand African self-determination of the course of research, development, and use of Genetic Biocontrol approaches for animal, public health and for conservation of wildlife and the environment 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 Consortium works with a variety of stakeholders and collaborators to advance best practices and informed decision-making for development of genetic biocontrol technologies to improve public health. The approach of the Consortium is to provide the member organizations to conduct activities individually or jointly under the Consortium brand.

The Consortium continues to 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 the public good, which will strengthen African influence on their development and provide critical input for decision-making by product developers, policy makers, and other stakeholders.

To all participants I do warmly welcome to Accra, Ghana and we do hope you will find time to visit some of the attractive places in Ghana.



Willy Tonui, PhD, EBS,
*Founder and Executive Director,
African Genetic Biocontrol
Consortium*

Genetic biocontrol is an approach for controlling or eliminating specific organisms that threaten public health, food security and biodiversity that uses genetic variants (natural, induced or transgenic) of the target species as the controlling agents to affect the target species in ways that reduce its undesirable impacts. Robust transgenic and genome editing technologies are fueling expanding research and development of genetic platforms and systems for combating pathogen and parasite-transmitting mosquitoes, plants and insects that reduce food security, and invasive species that are destroying biodiversity.

This unique Congress will focus exclusively on the topic of genetic biocontrol and will serve to encourage cooperation, collaboration, communication, and new and exciting science at a time when new technologies such as gene drive and Wolbachia-induced cytoplasmic incompatibility are being developed.

This Congress will bring together researchers investigating genetic systems with potential applications to genetic biocontrol with technology developers and those implementing genetic biocontrol strategies to share knowledge, foster new research, compare lessons-learned and develop best practices.

This Congress will feature discovery research along with technology development and ongoing operational experiences of those moving existing technologies to the field. The Congress will bring those working on insects, plants, fish, mammals, and other organisms together. This is an opportunity to bring researchers, developers, and practitioners together so that future genetic biocontrol activities will take place within a community with shared interests and values.



Kwame Dei Asamoah-Okyere,
Chief Executive Officer, National Biosafety Authority, Ghana, Chairman Local Organizing Committee

On behalf of the Local Organizing Committee, I wish to warmly welcome you all to the 2nd Global Congress on New and Emerging Genetic Biocontrol Technologies. 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 event at this magnificent and beautiful venue at the Alisa Hotel North Ridge.

The Congress is characterized by two-day pre-congress courses and another two for the main Congress. The courses will provide an introduction to the technical, regulatory, ethical and policy aspects of genetic biocontrol products (gene drives, gene editing) from the African context. I wish to assure the participants that these courses will be very interactive and encourage you to consider attending. I also wish to mention that the Congress offers an opportunity for participants and delegates from various countries to engage.

I wish to welcome you most sincerely to Accra, Ghana to attend the 2nd Global Congress on New and Emerging Genetic Biocontrol Technologies.

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.

Details of the current member organizations may be obtained from our website [Current Members - The African Genetic Biocontrol Consortium](#)

About The 2nd Global Congress On New Emerging Genetic Biocontrol Technologies

The Consortium is delighted to host the 2nd Global Congress on New and Emerging Genetic Biocontrol Technologies in Accra Ghana in March 17 to March 20, 2025. 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 event at xxx 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 for participating companies. The exhibition will provide delegates and exhibitors with excellent opportunities to network and will be placed on 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 2nd Global Congress on New Emerging Genetic Biocontrol Technologies, organized by the African Genetic Biocontrol Consortium will be held from March 17-20 at the Alisa Hotel North Ridge, Accra, Ghana.

Exhibition Schedule

The exhibition will be open from 8:00am – 6:00pm daily from March 19-20, 2025

Exhibitors will set up their booths from March 18, 2025.

Exhibitors will be required to remove their displays on March 21, 2025

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 2nd Global Congress on Biocontrol.

The Conference Planning Committee comprised of three subcommittees:

- Scientific Program; and
- Local organizing Committees

Scientific Programme Committee

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

Local Organizing Committee

The role of this subcommittee is to plan activities and events for congress outside of scheduled sessions including extra activities or events.

Congress Secretariat

The role of the Secretariat will be to provide administrative and logistical support to all Committee.

All the biographies of the Committees can be obtained by accessing the website

<https://conference2025.genbioconsortium.africa/committee/>

Members of the Planning Committee

The Congress Planning Committee is an ad hoc committee of the Consortium comprised of the Steering Committee members together with volunteers from each continent to assist in the planning of the 2nd Global Congress.



Dr Misheck Mulumba,
Congress President



Jackie Olang Kado,
Congress Vice President



Prof Charles Mbogo
Member



Martin Bundi,
Member

Members of the Scientific Programme Committee:



Prof Dorington O. Ogoyi,
Vice Chairman



Claus Schweinheim,
Member



Vibha Ahuja,
Member



Eric Okoree, Member



Thato Mogapi, Member



Dr. Larbi Baassi, Member

Members of the Local Organizing Committee:



Kwame Dei Asamoah-Okyere,
Chief Executive Officer, Ghana
National Biosafety Authority,
Member and Chair



Charles Quay, Chair and
Secretary of the Biorisk
Management Committee,
Noguchi Memorial Institute for
Medical Research, Ghana



Elaine Azu, Research scientist,
Biotechnology and Nuclear
Agriculture Research Institute
(BNARI), Ghana



Charles Afriyie-Debrah, Senior
Research Scientist, Council of
Scientific and Industrial Research-
Crops Research Institute (CSIR-
CRI), Kumasi, Ghana



Eric Okoree, Immediate Former
Chief Executive Officer of the
Ghana National Biosafety
Authority



Mary Ama Kudom-Agyemang,
Executive Director, Media
Platform on Environment and
Climate Change (MPEC)



Dr. Fred Aboagye-Antwi,
Senior Lecturer in medical
entomology and parasitology,
Department of Animal Biology
& Conservation Science,
University of Ghana.



Benjamin Obukowho Emikpe,
Department of Pathobiology,
School of Veterinary Medicine
(SVM), KNUST

Members of the Secretariat:



Willy Tonui, PhD, EBS,
Founder and Executive
Director, African Genetic
Biocontrol Consortium.



Caroline Thuo, Congress
Communication Specialist.



Cyrus Tareh, Congress
Scientific and Technical
Coordinator.



Andrew Kipkoech,
Congress ICT Support



Gilbert Rotich,
Congress Finance and
Administration

Keynote Speaker



Fredros Okumu,
*Professor of Vector Biology
 (Infectious Disease Ecology)
 at the University of Glasgow,
 School of Biodiversity, One
 Health and Veterinary
 Medicine.*

Dr. Fredros Okumu is the former Ifakara Director of Science. He served in the position for seven years - from 2016 to 2023. He holds a PhD in Infectious Tropical Diseases from London School of Hygiene and Tropical Medicine he obtained in 2012. Since 2008, Dr Okumu has been studying human-mosquito interactions and developing new techniques to complement existing malaria interventions and accelerate efforts towards elimination.

Dr. Okumu was originally trained as a Public Health Officer in the College of Health Sciences at the Moi University in Kenya. Before he obtained a PhD, he successfully attended a Master's degree program in Applied Parasitology at the University of Nairobi, Kenya, and a second Master's degree program in Geo-information Science, Earth Observation and Environmental Modeling from Lund University, Sweden.

Dr Okumu is an Associate Professor of Public Health at the University of Witwatersrand, South Africa; a Visiting Researcher at the Federal University of Minas Gerais, Brazil, and a honorary Research Fellow at the Institute of Biodiversity, Animal Health and Comparative Medicine, University of Glasgow, UK.

In addition to studying human-mosquito interactions and developing new techniques to complement existing malaria interventions and accelerate efforts towards elimination, Dr. Okumu has interests in quantitative ecology of residual malaria vectors; mathematical simulations to predict effectiveness of interventions, improved housing for marginalised communities, and prevention of child malnutrition.

Dr Okumu was awarded by the American Society of Tropical Medicine and Hygiene the Young Investigator Award in 2009, a Wellcome Trust Intermediate Research Fellowship in Public Health and Tropical Medicine (2014-2019), and most recently, a Howard Hughes-Gates International Research Scholarship (2018-2023).

He is currently a co-chair of the Malaria Eradication Research Agenda consultative group on Tools for Elimination, an Associate Editor of the journal, *Parasites & Vectors*, and a Co-Chair of the WHO Vector Control Working Group on New Tools for Malaria Vector Control. Dr. Okumu has also participated in various international expert panels on a wide range of subjects including, genetically modified mosquitoes and ivermectin for vector control, and the NEPAD Agency of the African Union's agenda on biotechnology in Africa.

Dr. Okumu was inducted in 2016 as a Young Affiliate of the African Academy of Sciences. He was also named among the 2016 Top 100 Global Thinkers by the US-based *Foreign Policy Magazine*.

https://scholar.google.com/citations?user=y_D1BGgAAAAJ&hl=en

Program At A Glance

Pre-Congress Courses: March 17 - 18, 2025

#	TITLE	ORGANIZERS	VENUE
001/2/2025	Regulatory frameworks and decision-making processes for emerging biotechnologies	Prof Dorington Ogoyi & Dr Vibha Ahuja	Ridge Hall
002/2/2025	Communicating Genetic Biocontrol Technologies.	Gloria Ogbaki and Caroline Thuo	Opera II Hall
003/2/2025	Principles & practices of biosafety and biosecurity for high containment facilities.	B.Sc. B.A. Rajka Fritsch and Larbi Baassi	Britannia Hall

Congress At A Glance

Congress Programme, March 19-20, 2025

DATE	TIME	SESSION	SESSION TITLE	VENUE
March 19, 2025	08.00 – 11.00	1	Plenary Session 1: Opening Ceremony and keynote address	Ridge Hall
	12.00 – 13.00	2	Plenary Session 2: Expanding capacity for research, development, and use of genetic biocontrol approaches in Africa.	Ridge Hall
	13.00 – 14.00		Poster Session	Gallery
	14.00 – 15.30	3	Plenary Session 3: Malaria control & NMCP perspective of new tool introduction.	Ridge Hall
	Parallel Sessions			
March 19, 2025	16.00 -18.00	4	Session 4A: Innovations and implications in vector control	Ridge Hall
			Session 4B: Requirements for analytic/research BSL-3 laboratories	Opera II Hall
	19.00- 21.00		Congress dinner and Award Ceremony	
March 20, 2025	08.30 – 10.30	5	Plenary Session 4: Science Communication and Institutional frameworks for public engagement on genetic biocontrol technologies.	Ridge Hall
	Parallel sessions			
	11.00 – 13.00	6	Session 5A: Regulatory and decision-making processes for Genetic Biocontrol.	Ridge Hall
			Session 5B: public engagement	Opera II Hall
	14.00 – 15.30	7	Plenary Session 5: Global and regional updates on gene drive governance	Ridge Hall
17.00 -	8	Plenary Session 6: Closing Ceremony	Ridge Hall	

Pre-Congress Course Programme March 17-18, 2025

Course 001/2/2025: Regulatory frameworks and decision-making processes for emerging biotechnologies

Course facilitators: Prof Dorington Ogoyi and Dr. Vibha Ahuja

Venue: Ridge Hall

About the Course

This preconference session is designed to provide participants with a foundational understanding of the regulation of emerging genetic biocontrol technologies. It will equip participants with knowledge and tools to navigate regulatory frameworks, assess risks, and ensure compliance with national and international guidelines. The session will focus on identifying regulatory challenges, evaluating potential risks and benefits, and fostering robust oversight mechanisms. Emphasis will be placed on applying evidence-based practices, stakeholder engagement, and ethical considerations to enhance the safe and responsible development of genetic biocontrol technologies.

Course Program

Time	Registration	Speaker	Moderator
DAY 1: MARCH 17, 2025			
08:30 - 09:30 AM	Welcome Remarks	Eric Okoree	Cyrus Tareh
	Introduction to the Workshop	Prof Dorington Ogoyi	
	Pre-workshop assessment	Vibha Ahuja	
SESSION 1 FUNDAMENTALS OF GENE DRIVE TECHNOLOGIES AND REGULATORY FRAMEWORK			
09:30 - 10:00 AM	Sterile Insect Techniques (SIT) for mosquito control. This session will describe Insect Incompatibility techniques (IIT) methods and their impact on mosquitoes, comparing SIT and IIT during mosquito development and advances in SIT and IIT for effective mosquito control.	Givemore Munhenga	Eric Okoree
10:00 - 10:30 AM	Fundamentals of gene drive technologies, genome editing and GMOs This session will provide an overview of the gene drive system e.g. CRISPR-Cas9, Homing Endonuclease genes; principles of genome editing; applications in agriculture, healthcare, and conservation biology; and ethical considerations and societal impact.	Daniel Maeda	
10:30 - 11:00 AM	Q&A		
11:00 - 11:30 AM	Break and Photo Session		
11:30 - 12:00 PM	Introduction to WHO Guidance for GMMs and Containment Practices for Arthropods Modified with Engineered Transgenes Capable of Gene Drive. This session will discuss the WHO Guidance for GMMs and Arthropod Containment Guidelines which provides recommendations for containment and best practices in research with arthropods containing engineered transgenes capable of gene drive.	Brian Tarimo	Josphat Muchiri
12:00 - 12:15 PM	Q&A		
12:15 - 12:45 PM	Regulatory frameworks for gene drives and genome editing <i>The session will present the global developments including under the Cartagena Protocol on Biosafety); regional and country specific approaches for regulating gene drives and genome editing research and applications.</i>	Vibha Ahuja	Prof Ogoyi
12:45 - 1:00 PM	Q&A		
1:00 - 2:00 PM	Lunch		

SESSION 2: RISK ASSESSMENT AND STAKEHOLDER ENGAGEMENT

2:00 – 2:30 PM	Designing a regulatory framework This presentation is intended to provide general principles that guide how an effective regulatory framework is designed and provide case studies of functional regulations in other regions.	Eric Okoree	Vibha Ahuja
2:30 – 2:45 PM	Q&A		
2:45 – 3:15 PM	Risk assessment and Risk management frameworks for gene drive research This session will provide participants with foundational knowledge of environmental and health risk assessment principles in the context of gene drive research. It will inform on risk management frameworks that are specific to gene drive technologies, equipping participants with tools to evaluate potential environmental and health safety impacts. Emphasis will be placed on applying these frameworks to ensure responsible research and development.	Josephat Muchiri	Daniel Maeda
3:15 – 3:30 PM	Q&A		
3:30 – 4:00 PM	Tools and methodologies in risk assessment of genetic biocontrol technologies <i>This session will focus on tools and methodologies for evaluating the potential impacts of gene drive technologies. Participants will gain insights into the gene drive risk assessment guidelines approved in CBD COP16 in Cali, exploring their application in assessing ecological and health risks. The session will emphasize practical approaches to identifying and mitigating potential impacts, ensuring alignment with international best practices.</i>	Vibha Ahuja	Givemore Munhenga
4:00 – 4:30 PM	Q&A		
4:30 – 5:00 PM	Tea Break		
5:00 – 5:30 PM	Group discussion: Exercises in conducting risk assessment This session will enable the participants to discuss elements considered when performing risk assessment.	Josephat Muchiri	Vibha Ahuja
5:30 – 6:00 PM	Q&A	All	
6:00 PM	End of Day 1		
7:30 PM	Group dinner		

DAY 2: MARCH 18, 2025

SESSION 3: EMERGING TECHNOLOGIES AND THE SOCIETY

8:30 - 9:00 AM	Public engagement and Stakeholder communication <i>This session will focus on the important role of communication and stakeholder engagement on emerging technologies and their regulation. It will examine best practices and tools that promote transparent, inclusive, and informed dialogue among scientists, policymakers, regulatory authorities, and other stakeholders.</i>	Philbert Nyinondi	Brian Tarimo
9:00 – 9:30 AM	Community stakeholder perspectives during ARTs-based Approaches as community engagement mechanisms for piloting the sterile insect technique in South Africa. <i>This session will describe exploratory qualitative approach using key informant interviews to understand stakeholder experiences with the three arts-based approaches in genetic biocontrol.</i>	Givemore Munhenga	
9:30 – 9:45 AM	Q&A	All	

9:45–10:15 AM	Ethical, social, and cultural dimensions This session will address ethical dilemmas in genome editing. It will also reveal the socio-cultural considerations for introducing gene drive technologies and explain the importance of respecting traditional knowledge systems and community values as stakeholders attempt to balance innovation with societal acceptance.	Simon Langat	Givemore Munhenga
10:15–10:30 AM	Q&A		
10:30–11:00 AM	Tea Break		
SESSION 4: CAPACITY DEVELOPMENT AND MONITORING			
11:00–12:00 PM	Capacity development for biosafety regulators This session is designed to enhance the capacity of regulators, developers and policymakers in overseeing genetic biocontrol technologies. It will feature training modules tailored to their needs. The session will also emphasize building cross-sectoral collaboration to strengthen oversight and introduce practical tools for effective policy development and implementation. Participants will gain skills and knowledge to support responsible governance and advance regulatory frameworks.	Eric Okoree	Simon Langat
12:00–12:15 PM	Q&A		
12:15–12:45 PM	Applications of gene drives in agriculture and healthcare This session will explore case studies of gene drive applications, such as targeting mosquito populations for malaria control and genome editing for crop improvement and pest management. It will highlight the potential role of these technologies in enhancing public health and agricultural productivity. Participants will gain insights into practical applications and the broader implications for sustainable development.	Vibha Ahuja	
12:45–1:00 PM	Q&A		
1:00–2:00 PM	Lunch		
2:00–2:45 PM	Monitoring and surveillance for gene drive applications This session focuses on the practical aspects of setting up monitoring systems for field releases of genetic biocontrol technologies. Participants will explore methods for identifying and managing unintended consequences, ensuring safety and compliance. The session will also cover the development of effective reporting systems and compliance mechanisms to support transparent oversight and adaptive management in the field.	Prof Dorington Ogoyi	Brian Tarimo
2:45–3:00 PM	Q&A		
3:00–3:45 PM	Practical training and demonstration This session is designed to provide participants with hands-on training in regulatory management tools and decision-making processes for genetic biocontrol technologies through simulation exercises and interactive risk assessment scenarios. Participants will gain practical experience in applying regulatory frameworks to real-world challenges.	Eric Okoree	
3:45–4:00 PM	Q&A		
4:00–4:30 PM	Tea Break		
4:30–4:45 PM	Post-workshop assessment		Cyrus Tareh
4:45–5:00 PM	Discussion and Course Evaluation	Dorington Ogoyi/ Vibha Ahuja	
5:00–5:30 PM	Closing		

5:30 PM **End of Workshop**

Course 002/2/2025: Pre-Congress Course on Communicating Genetic Biocontrol Technologies

Course Coordinators: Gloria Ogbaki and Caroline Thuo

Venue: Opera II Hall

About the Course

The course will provide an opportunity to scientists researchers and science communicators to interrogate innovative communication approaches to address gaps in communicating genetic biocontrol technologies which include gene drives, gene editing, and synthetic biology; explore how to develop key messages and appreciate the impact of official communication, mainstream and social media in the public exchange of scientific information between scientists (experts), government (policymakers), intermediaries (journalists and social media platforms), and citizens (non-experts and influencers) during the development of genetic biocontrol products.

Course Programme

DAY ONE: MARCH 17, 2025		
SESSION 1: BASIC SCIENCE OF GENE DRIVES		
SESSION CHAIR: MARY AMA		
08.30 am - 09.00 am	Opening Remarks	Rosalia Omungo
	Workshop Objectives and Gauging Expectations- Individual Pentagons	Gloria Ogbaki
09:00 am - 10.00 am	The basic science and case studies of genetic biocontrol technologies in the African continent	Amelie Wamba
	Current and upcoming genetic biocontrol technologies and their application in disease vector control	Dickson Lwetoijera
10.00 am - 10.30 am	Q& A	All
10.30 am - 11.00 am	Break and Group Photo	All
SESSION 2: FOUNDATIONS OF RISK COMMUNICATION IN SCIENCE		
SESSION CHAIR: SAMUEL OWUSU		
11.00 am - 11.30 pm	Communicating uncertainties in science, regulatory decision-making, in addressing public concerns	Andrew Kiggundu
11.30 am - 12.00 pm	Q & A	All
12.00 pm - 12.15 pm	Case Studies and Lessons learned – Examples of effective and ineffective science risk communication, insights from journalists and scientists	Milly Murigi
12.15 pm - 12.45 pm	Social Media and Science – Best platforms used in science communication to engage broader audiences	Abraham Isah
12.45 pm -13.00 pm	Q& A	All
13:00 pm- 14:00 pm	Lunch Break	All
SESSION 3: IDENTIFYING BIOSAFETY CONCERNS		
SESSION CHAIR: ABRAHAM ISAH		
14.00 pm - 14.45 pm	Identifying opportunities for communicating biosafety to different groups (<i>farmers, media, consumers, industry, researchers, and policymakers, etc.</i>)	All
	Presentation of the concerns	All
14.45 pm - 15:30 pm	Regulatory frameworks and policies	Gloria Ogbaki
15:30 pm - 16.00 pm	Tea Break	All
16.00 pm - 17.00 pm	Handling challenging biosafety questions	Eric Okoree
17.00 pm	DAY 1 ENDS	
19.30 pm	Group dinner	

DAY TWO: MARCH 18, 2025
SESSION 4: DEVELOPING MESSAGE MAPS
SESSION CHAIR: ANDREW KIGGUNDU

08.30 am - 09.00 am	Introduction to message mapping	Andrew Kiggundu
09.00 am - 10.00 am	Practical session – Using narratives to make scientific research understandable, relatable, and memorable	Milly Murigi
10.00 am - 10.30 am	Tea Break	All
10.30 am - 11.30 am	Presentation and discussion of the practical session group work	All
11.30 am - 12.15 pm	Introduction to effective media relations: Working with the media Pitching stories Building media networks – pairing scheme	Rosalia Omungo
12.15 pm - 12.30 pm	Q&A	
12.30 pm - 01.00 pm	Managing Science news for reporters and journalists – anticipating how journalists might frame a story, aligning science stories with public interest	Mary Ama
01.00 pm - 01.15 pm	Q&A	All
01.15 pm - 02.00 pm	Lunch Break	All

SESSION 5: EFFECTIVE MEDIA INTERVIEWS
SESSION CHAIR: ROSALIA OMUNGO

02.00 pm - 03.00 pm	Practical Mock Media Interviews and Role Play – Scientists and Journalists	Milly Murigi
03.00 pm - 03.30pm	Public Engagement: Strategies and Tools	Philbert Nyinondi
03.30 pm - 04.00 pm	Tea Break	All
04.00 pm - 04.30 pm	Engaging Policymakers: Strategies and Tools	Eric Okoree
04.30 pm - 05.00 pm	Measuring Impact: Strategies and Tools to evaluate success of science communication initiatives	Philbert Nyinondi
05.00 pm - 05.30 pm	Workshop evaluation and action plans for post-workshop follow-up	Carol Thuo
05.30 pm	Closing remarks Gloria Okbaki/Caroline Thuo	
	Pre-congress course ends	

Course 003/2/2025: Pre-Congress Course on the Principles & practices of biosafety and biosecurity for high containment facilities

Course facilitators: Dr. Larbi Baasi & B.Sc. B.A. Rajka Fritsch

Venue: Britannia Hall

Course Programme

Day 1		Monday, March 17, 2025	
Time	Topic	Speaker	Moderator
08:30 - 09:00 am	Registration		Andrew Kipkoech
09:00 - 09:15 am	Opening remarks	Martin Bundi	Larbi Baassi
09:15 - 09:30 am	Workshop and lecturers introduction	Rajka Fritsch	
09:30 - 10:00 am	Introduction of participants and expectations	All	
10:00 - 10:15 am	Pre-Evaluation		
10:15 - 11:00 am	Presentation 1: Overview of Biosecurity	Larbi Baassi	Rajka Fritsch
11:00 - 11:15 am	Q&A		
11:15 - 11:30 am	Coffee break		
11:30 - 12:15 pm	Presentation 2: Actual overview of relevant standards and guidelines, background and basic requirements	Claus Schweinheim	Martin Bundi
12:15 - 12:30 pm	Q&A		
12:30 - 14:00 pm	Lunch		
14:00 - 14:45 pm	Presentation 3: User Requirement Specification (URS) as first step to define.	Rajka Fritsch	Larbi Baassi
14:45 - 15:00 pm	Q&A		
15:00 - 15:45 pm	Presentation 4: Collaboration of trades and biosafety consultants in building projects.	Fabio Blaha	Charles Quaye
15:45 - 16:00 pm	Q&A		
16:00 - 16:15 pm	Coffee break		
16:15 - 16:30 pm	Post-evaluation		
16:30 - 17:15 pm	Group Discussion and summary of results	Larbi Baassi	Claus Schweinheim

Day 2			
Tuesday, March 18, 2025			
Time	Topic	Speaker	Moderator
09:00 - 09:15	Pre-Evaluation		Larbi Baassi
09:15 - 09:45	Presentation 5: Preparation of an operation and incident matrix	Rajka Fritsch	
09:45 - 10:00	Q&A		
10:00 - 10:15	Coffee break		
10:15 - 11:00	Presentation 6: Tightness requirements and test methods for different room types	Claus Schweinheim	Larbi Baassi
11:00 - 11:15	Q&A		
11:15 - 12:00	Presentation 7: Biosafety qualification: testing and commissioning and Certification	Fabio Blaha	Claus Schweinheim
12:00 - 12:15	Q&A		
12:15 - 13:45	Lunch		
13:45 - 14:30	Presentation 8: Dual Use Research of Concern (DURC): Challenges and Implications for the African Continent	Larbi Baassi	Rajka Fritsch
14:45 - 15:00	Q&A		
15:00 - 15:45	Presentation 9: Pressure cascading concepts and filter strategies for laboratories	Claus Schweinheim	Larbi Baassi
15:45 - 16:00	Q&A		
16:00 - 16:15	Coffee break		
16:15 - 17:00	Presentation 10: Validation: H ₂ O ₂ decontamination	Rajka Fritsch	Fabio Blaha
17:00 - 17:15	Q&A		
17:15 - 17:45	Post evaluation and Closing remarks	Larbi Baassi	Rajka Fritsch

Congress Programme

Day 3: Wednesday March 19, 2024	
Time	Programme
7.00	REGISTRATION Coordinators: Caroline Thuo, Gilbert Rotich and Andrew Kipkoech
PLENARY SESSION 1: OPENING CEREMONY AND KEYNOTE ADDRESS	
MODERATOR: MARY AMA KUDOM-AGYEMANG, EXECUTIVE DIRECTOR, MEDIA PLATFORM ON ENVIRONMENT AND CLIMATE CHANGE (MPEC), GHANA).	
RIDGE HALL	
9.00- 11.00	<p>Welcome Remarks: Kwame Dei Asamoah-Okyere, Chief Executive Officer, Ghana National Biosafety Authority, Chair Local Organizing Committee</p> <p>Welcome Remarks: Willy Tonui, Executive Director and Head of the Secretariat, African Genetic Biocontrol Consortium</p> <p>Welcome Remarks: Misheck Mulumba, Congress President</p> <p>Welcome Remarks: Michael Santos, PhD Senior Vice President, Science Partnerships, Foundation for the National Institutes of Health</p> <p>Opening Remarks by the Chief Guest: Hon. Ibrahim Murtala Mohammed, Minister for Environment, Science, Technology and Innovation, Ghana</p> <hr/> <p>Keynote address: Integrating genetic biocontrol into malaria control programs in a changing climate. <i>Fredros Okumu, Professor of Vector Biology (Infectious Disease Ecology) at the University of Glasgow, School of Biodiversity, One Health and Veterinary Medicine.</i></p> <p>This presentation will explore key aspects of integrating genetic biocontrol into malaria control programs in Africa in the face of evolving environments which include research, regulatory, and ecological conditions. It will discuss various questions that need to be addressed in order to successfully integrate these technologies, including the optimal implementation strategies, their impact on vector control and other interventions, and their potential to reduce the burden of malaria in different epidemiological settings.</p>
11.00	COFFEE BREAK & Photo session
PLENARY SESSION 2: EXPANDING CAPACITY FOR RESEARCH, DEVELOPMENT, AND USE OF GENETIC BIOCONTROL APPROACHES IN AFRICA	
MODERATOR: ERIC OKOREE	
RIDGE HALL	
12.00 – 13.00	<p>This session will describe the objectives for establishment of the African Genetic Biocontrol Consortium, goals and objective, thematic areas, and the role of member organizations which include Africa One Health Network (AfOHNet), Africa Biological Safety Association (AfBSA), The Multilateral Initiative on Malaria (MIM), Network of African Science Academies (NASAC) and the Pan-African Mosquito Control Association (PAMCA).</p> <p>Presenters:</p> <ol style="list-style-type: none"> Willy Tonui: Expanding capacity for research, development, and use of genetic biocontrol approaches in Africa: The role of African Genetic Biocontrol Consortium. Misheck Mulumba: Managing Zoonotic Infectious Diseases in Africa: The Key Role of the One Health Approach. Martin Bundi: Expanding capacity for safety and security of biological materials in research, development in Africa: The role of African Biological Safety Association (AfBSA). Charles Mbogo: An Africa free of mosquito-borne diseases: The role of Pan-African Mosquito Control Association (PAMCA).
13.00 – 14.00	Lunch break, Posters and exhibitions (ORGANIZERS: ELAINE AZU & CHARLES AFRIYIE-DEBRAH)
PLENARY SESSION 3: MALARIA CONTROL & NMCP PERSPECTIVE OF NEW TOOL INTRODUCTION	
MODERATOR: CHARLES MBOGO	
RIDGE HALL	
14.00 - 15:30	This panel discussion will explore the potential of these novel approaches, focusing on feasibility assessment, operational integration, and regulatory considerations. It will also outline an action plan for pilot testing, emphasizing site selection, stakeholder engagement, and impact assessment. Strategies for scaling up these interventions will be discussed, including capacity-building, policy alignment, and sustainable funding mechanisms.

	<p>Panelists</p> <ol style="list-style-type: none"> Dickson Lwetoijera, Ifakara Health Institute, Tanzania Austin Burt, Professor of Evolutionary Genetics, Imperial College London / Principal Investigator, Target Malaria Jonathan Kayondo, Uganda Virus Research Institute. Fredros Okumu, University of Glasgow, School of Biodiversity, One Health and Veterinary Medicine.
15.30-16.00	COFFEE Break
PARALLEL SESSIONS	
SESSION 4A: INNOVATIONS AND IMPLICATIONS IN VECTOR CONTROL	
MODERATOR: FRED ABOAGYE-ANTWI	
	RIDGE HALL
16.00	<p>This session will explore the potential of gene drive technology as a transformative approach to vector control, adapting this technology to develop powerful genetic tools tailored to tackle specific pests of concern specifically targeting <i>Anopheles</i> mosquitoes, the primary vectors of malaria.</p> <p>Presenters:</p> <ol style="list-style-type: none"> Amelie Wamba Ndongmo: Harnessing Gene Drive Technology for Sustainable Malaria Control in Africa. Lakamy Sylla: Developing genetic tools for the control of Malaria vectors: targeting male mosquito fertility Anna Strampelli: Development of the first self-sustaining gene drive for population suppression, for malaria mosquito, <i>anopheles gambiae</i>. Paulette Ndjeunia-Mbiakop: Use of the salivary peptide Gsg6-P1 as a biomarker for assessing human exposure to <i>Anopheles</i> spp. bites in a context of LLINS use in two localities of the East Region of Cameroon. Justin Overcash: The Potential use for AI in the Risk Assessment of Gene Drive Modified Mosquitoes. Seth O. Agyei: Effects of environmental stress factors at larval stage on male <i>Anopheles gambiae</i> fitness
SESSION 4B: REQUIREMENTS FOR SAFE AND SECURE DEVELOPMENT FOR GENETIC BIOCONTROL STUDIES.	
MODERATOR: BENJAMIN OBUKOWHO EMIKPE	
	OPERA HALL
16.00	<p>The session will discuss highlights international regulations and ways to set up and operate a facility in close cooperation with local structures.</p> <p>Presenters:</p> <ol style="list-style-type: none"> Okorie Joseph Michael: Genetic Biocontrol: Ensuring Safe and Secure Development through Biosafety, Biosecurity and Biocontainment in Africa. Songwe Fanuel: Adoption of Biosafety and Biosecurity Standards for High-Containment Facilities in Low- and Middle-Income Countries Through Policy Harmonization. Charles Afriyie-Debrah: Effective Biosafety Systems on the Nitrogen Use efficiency, Water Use efficiency and Salinity Tolerant Genetically modified Rice Trial in Ghana Onyeka Kingsley Nwosu: The Potentials of <i>Bacillus thuringensis</i> Isolate and Its Cuticle-Degrading Enzymes Activity in the Biological Control of <i>Callosobruchus maculatus</i> in Stored Cowpea (<i>Vigna unguiculata</i> L. Walp) Antonio Nkondjio Christophe: The Central African Research and Health Ethics Committee (CERSAC): organisation, scope and challenges for better supervision and monitoring of biomedical and genetic biocontrol studies in Central Africa. Dipl.-Ing. Claus Schweinheim: Design and Build of a BSL-3 laboratory facility and T&C of a laboratory. Fortunate Muyambi: Enhancing Biotechnology Frameworks in the East African Community (EAC) for Sustainable Development
END OF DAY 1	

Day 4: Thursday March 20, 2025	
Time	Programme
8.30	<p>PLENARY Session 4: Ridge Hall</p> <p>Science Communication and Institutional frameworks for public engagement on genetic biocontrol technologies (Moderators: Ama Kudom and Gloria Ogbaki)</p> <p>The session will discuss how the Science Communication (SCICOM) hosted by the African Genetic Biocontrol Consortium is helping to build an informed community of communication experts and local leadership that strengthens public engagement on genetic biocontrol technologies for animal, public health, and conservation in Africa.</p> <p>Presenters:</p> <ol style="list-style-type: none"> Caroline Thuo: Communicating the uncertainties associated with genetic biocontrol approaches: the role of African Genetic Biocontrol Consortium Milliam Murigi: Bridging the science communication gap: A look into the successes of the Media Science Cafes by Media for Environment, Science, Health, and Agriculture (MESHSA). Cyrus Tareh: Addressing the training needs for scientists, developers, communicators, regulators and other stakeholders for Genetic Biocontrol Products in Africa: progress made for Institutional Oversight Committees. Edward Okonjo: Insights of stakeholders in Kenya on gene drive modified mosquitoes for malaria control and elimination. Givemore Munhenga: From song to stories: assessing the impact of exposure to Arts-based community engagement tools in shaping Knowledge, attitudes, and acceptability toward the Sterile insect technique in south africa Andrew Kiggundu: Addressing misconceptions about genetically modified organisms' technology as it transitions from crop to livestock and human health in Africa.
10.30	COFFEE BREAK
PARALLEL SESSIONS	
<p>SESSION 5A: REGULATORY AND DECISION-MAKING PROCESSES FOR GENETIC BICONTROL RIDGE HALL</p> <p>MODERATOR: CHARLES QUAYE</p>	
11.00	<p>The Session will consider regulatory approaches and legislative context on decision-making process for genetic biocontrol in Africa. It will also highlight the progress made towards capacity for oversight committees in decision-making process for genetic biocontrol in Africa</p> <p>Speakers:</p> <ol style="list-style-type: none"> Vibha Ahuja: Advancing LMO Risk Assessment and Risk Management: Key outcomes from COP 16. Gansane Adama: Strengthening the Regulatory and Legislative Frameworks for the Safe Deployment of Gene Drive Technology: Insights from Burkina Faso. Okorie Joseph Michael: Developing genetic biocontrol policies and guidelines: Key to mitigating misuse and promoting public acceptance. Amelie Wamba: Building Capacity for Gene Drive Research: Empowering African Scientists and Communities. Simon Langat: Regulatory excellence in African Genetic Biocontrol Kebenei Enock: Building Synergistic Relationship between Ethics Committees and Biosafety Committees for Effective Governance of Genetic Biocontrol Technologies: Case of Kenya Medical Research Institute. Josephat Muchiri: Risk assessment of GM Animals
<p>SESSION 5B: INSECTICIDE RESISTANCE AND GENE DRIVES OPERA II HALL</p> <p>MODERATOR: BRIAN TARIMO</p>	
11.00	<p>The session will discuss progress made towards the understanding of the spread of insecticide genes and how it can inform how gene drives would spread.</p> <p>Speakers:</p> <ol style="list-style-type: none"> Austin Burt: How might we use information on the spread of insecticide resistance genes to predict the potential spread of gene drives? Nikolay Kandul: SEPARATOR and NextGenSIT are novel tools for safe and efficacious elimination of <i>Anopheles</i> malarial mosquitoes. Nadège Sonhafouo Chiana: High insecticide resistance and loss of net physical integrity: A big challenge for vector control in Cameroon.

	<ol style="list-style-type: none"> 4. Kanouo Christin Micael: Strategic Control of Malaria: A Data-Driven Approach for Targeted Interventions in Yaoundé. 5. Thomas Gyimah: Does suppressing anopheles gambiae impact pollination service? A case for balancing ecology and public health 6. Jovid Okine: Effects of larval rearing background colour on anopheles gambiae fitness
13.00-14.00	<p>Lunch break</p> <p>Posters and exhibitions (ORGANIZERS: ELAINE AZU & CHARLES AFRIYIE-DEBRAH)</p>
14.00-15.30	<p>PLENARY Session 5: Ridge Hall</p> <p>Global and regional updates on gene drive governance</p> <p>Organizer: Outreach Network for Gene Drive Research</p> <p>Moderator: Dickson Lwetoijera, Ifakara Health Institute</p> <p>Speakers:</p> <ol style="list-style-type: none"> 1. Charles Mugoya: International policy debate: What is happening at the Convention on Biological Diversity? <i>A summary of key developments and decisions from the CBD relevant to synthetic biology and risk assessment of gene drives.</i> 2. Brinda Dass: Regional and global perspectives on gene drive regulation. <i>Discussion on the state of regulatory and governance frameworks for gene drives outside of Africa, covering regional priorities and challenges.</i> 3. Isabelle Coche: IUCN policy on synthetic biology is on the horizon. Insights into the IUCN synthetic biology <i>policy process and the road ahead to WCC 2025.</i> 4. Wiltshire Johnson: AUDA-NEPAD update on regional work. <i>Presentation on AUDA-NEPAD's initiatives and progress in governance and capacity-building efforts related to synthetic biology, particularly on gene drives.</i>
15.30-16.00	Coffee break
17.00	<p>PLENARY Session 6: Ridge Hall</p> <p>CLOSING CEREMEONY</p> <p>COORDINATOR: MISHECK MULUMBA</p>
END OF THE CONGRESS	

Abstracts

Title: Expanding capacity for research, development, and use of genetic biocontrol approaches in Africa: The role of African Genetic Biocontrol Consortium.

Willy Tonui, Founder and Executive Director, African Genetic Biocontrol Consortium

Abstract: The African Genetic Biocontrol Consortium (The Consortium) (<https://www.genbioconsortium.africa/>) was established as an agreement among member organizations committed to contributing and expanding African self-determination of the course of research, development, and use of Genetic Biocontrol approaches for animal, and public health and for conservation of wildlife and the environment in Africa. Members are not-for-profit member organizations based in Africa that included the Africa One Health Network (AfoHNet) (<https://afohnet.org/>), Africa Biological Safety Association (AfBSA) (<http://www.afbsa.africa/>), The Multilateral Initiative on Malaria (MIM), Network of African Science Academies (NASAC) (<https://nasaonline.org/>), Pan-African Mosquito Control Association (PAMCA) (<https://www.pamca.org/>) and the GeneConvene ([GeneConvene Global Collaborative | FNIH](#)). The goal for establishing the Consortium is to provide a platform for interaction for public good among experts, scientists, product developers, policy makers, universities, research organizations and other stakeholders, promote sustainable training and capacity building programmes, knowledge exchange on the science, development, use, and communication during development and decision-making of genetic biocontrol approaches in Africa.

The goal of this presentation is to provide an opportunity for scientists and professionals working in organizations in the African region engaged in emerging technologies (gene drive/editing and synthetic biology) to highlight the guidance and good practices that are available, as well as any current gaps. Participants will also be able to learn more about the initiatives and frameworks currently in place in the African region.

Title: Managing Zoonotic Infectious Diseases in Africa: The Key Role of the One Health Approach.

Misheck Mulumba, Chairperson of the African One Health Network (AfoHNet).

Abstract: Recent global disease events highlight the significant impact of zoonotic diseases on human and animal health. Changes in the environment, such as human encroachment, climate change, population growth, and agriculture intensification are factors contributing to zoonotic disease emergence. Given the overlap of disciplines and interaction of factors resulting in the manifestation of zoonotic diseases, their management also requires a multidisciplinary approach. The One Health approach to detection, diagnosis, and reporting of disease events should employ a multi-disciplinary approach to address interactions among human, animal, and environmental health risks and threats. This strategy has been recognized as a major component to global health security by international organizations and further promoted by targets within the Global Health Security Agenda and UN Development Sustainability Goals. Across the African continent, there are multiple national, regional, and sub-regional networks that are centered around One Health initiatives. How well mobilized or effective they are to deal with zoonotic diseases is a subject of conjecture as none of the disciplines involved; human health, agriculture (animal health) and environmental health have enough epidemiological information at their disposal at any given time due inadequate collaboration and information exchange required to effectively manage the zoonotic disease. Given the low resource setting in most African countries, One Health initiatives must be practical and make use of risk-based initiatives to stretch the limited resources available while being effective. Pooling of resources for surveillance diagnostics and control should be multidisciplinary for effective resource utilization. The use of One Health effective approaches cannot therefore be overemphasized. We argue for implementation of One Health collaboration in controlling and effectively managing zoonotic infectious diseases in Africa.

Title: Expanding capacity for safety and security of biological materials in research, development in Africa: The role of African Biological Safety Association (AfBSA).

Martin Bundi, President, African Biological Safety Association (AfBSA).

Abstract: The African Biological Safety Association (AfBSA) is a non-governmental and non-profit organization that promotes biosafety and biosecurity in Africa. It represents professionals working in the field of biosafety and aims to make biosafety a recognized profession with well-defined tasks and qualifications. AfBSA is a professional association that congregates practitioners of biological safety, promotes biosafety and biosecurity as a discipline through awareness, and facilitates the sharing of biosafety and biosecurity information in the African region.

The organization works to expand biosafety awareness and promote the development of work practices, equipment and facilities to reduce the potential for occupational illness and adverse environmental impact from infectious agents or biologically derived materials.

AfBSA supports emerging legislation and standards in the areas of biosafety, biosecurity, biotechnology, transport and associated activities.

The African Biological Safety Association (AfBSA) seeks to engage and promote biosafety, including biosecurity... AfBSA represents professionals working in the field of biosafety and endeavors to make biosafety a recognized profession with well-defined tasks and qualifications. To achieve these objectives, AfBSA is currently developing initiatives towards training its members to attain the necessary skills in Biosafety and Biosecurity.

Title: An Africa free of mosquito-borne diseases: The role of Pan-African Mosquito Control Association (PAMCA)

Charles Mbogo, Past President, Pan-African Mosquito Control Association (PAMCA)

Abstract: The Pan-African Mosquito Control Association (PAMCA) is an African member-based professional body that brings together stakeholders in the field of vectors and vector-borne diseases control including scientists, public health professionals, vector control specialists, affected communities and other stakeholders to work together and adopt best practices for the control and elimination of vector-borne diseases in Africa and worldwide.

PAMCA's core mandate consists in capacity building for vector-borne disease surveillance and elimination, building collaboration and partnership with key stakeholders in the vector-borne disease elimination agenda, knowledge management of vector-borne disease sciences and best practices, strengthening the role of women in vector control to achieve gender empowerment, inclusivity, and equity, and strengthening governance structures for organizational sustainability. PAMCA aims at connecting African-based public health entomologists, public health professionals and other actors engaged in vector control and elimination efforts in Africa, working towards a common vision of "An Africa free of vector-borne diseases."

Title: Harnessing Gene Drive Technology for Sustainable Malaria Control in Africa

Amelie Wamba Ndongmo Regine, PhD in Biochemistry, University of Yaoundé I, Yaoundé, Cameroon, [amelie.wamba@pamca.org](mailto:wamba@pamca.org)

Abstract: Malaria remains a significant public health challenge in Africa, necessitating innovative solutions to combat its transmission. This presentation will explore the potential of gene drive technology as a transformative approach to vector control, specifically targeting *Anopheles* mosquitoes, the primary vectors of malaria. By leveraging CRISPR-Cas9 gene editing techniques, we can develop genetically modified mosquitoes that exhibit reduced reproductive capabilities or altered susceptibility to malaria parasites. This session will discuss the scientific underpinnings of gene drive mechanisms, the ethical considerations surrounding their deployment, and the importance of capacity building among African researchers and stakeholders. Emphasizing community engagement and collaboration with national malaria control programs, we aim to foster a comprehensive understanding of gene drive innovations and their role in achieving sustainable malaria control across the continent.

Title: Developing genetic tools for the control of Malaria vectors: targeting male mosquito fertility

Lakamy Sylla^{1,2*}, Jasmina Kuburic², Amadou Guindo¹, Roberto Galizi²

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² Keele University, United Kingdom

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Background: Mosquitoes are responsible of more than 700 million cases of disease per year including malaria which has killed 619 000 people with 247 million cases in the world in 2021. Current malaria control tools have saved lives but are insufficient to achieve the goal of elimination. Hence, self-limiting strategies such as Sterile Insect Techniques and other intermediate approaches are gaining interest as genetic control methods for malaria mosquitoes. These strategies may be developed by targeting genes that are involved with mosquito fertility and reproduction that can be used as a target to generate transgenic insects unable to reproduce such as sterile males.

Methods: We initially investigated the phenotypic outcome when disrupting the α -tubulin during *Anopheles gambiae* spermatogenesis using a PiggyBac inserted CRISPR construct.

Results: Initial genotyping work showed no inheritable mutations from transgenic males expressing the Cas9 endonuclease under the male meiotic α -tubulin promoter and two guide RNAs (gRNAs) simultaneously targeting the endogenous α -tubulin coding sequence.

Conclusion: Although an in-depth genotypic characterisation is still ongoing, the current results may indicate possible meiotic drive mechanisms which may prevent inheritance of the chromosome carrying CRISPR-induced indels providing useful insights in the development of genetics tools aimed to target mosquito male fertility.

Key words: malaria, *Anopheles*, fertility, CRISPR/Cas9

Title: Development of the first self-sustaining gene drive for population suppression, for malaria mosquito, *anopheles gambiae*.

Anna Strampelli¹, Kevin Gorman¹, Andrew Hammond¹

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BACKGROUND Genetic insect control technologies that aim to suppress or modify target pest populations through the release of genetically modified individuals of the same species are now widely recognised as having the potential to be effective across large areas, environmentally friendly, and cost efficient. pioneering work conducted at imperial college London by the scientific cofounders of biocentis led to the development of the first self-sustaining gene drive for population suppression, which eliminated caged populations of the malaria mosquito, *anopheles gambiae*, following a single release of modified males.

Methods: At biocentis, we are adapting this technology to develop powerful genetic solutions tailored to tackle specific pests of concern. With all stakeholder requirements in mind from the outset, we are manipulating the speed of action, degree of persistence, operational needs, and associated business models to provide local entities with off-the-shelf products that will deliver the performance and environmental profiles both markets and regulators require.

Results: Two lead products, *aedes aegypti* for public health and *drosophila suzukii* for agriculture, that have class-leading efficacy, no long-term persistence and will be supply chain ready, are now coming through the pipeline. further products with strong relevance to african markets are anticipated.

Conclusions: No single genetic control technology or format is suitable for all insect pests, but when tailored to stakeholder requirements from the outset, outcomes can be optimized. Early engagement with regulators, end-users, supply chains, and implementation partners is a critical component of successful product development.

Title: Use of the salivary peptide Gsg6-P1 as a biomarker for assessing human exposure to *Anopheles* spp. bites in a context of LLINs use in two localities of the East Region of Cameroon

Paulette Ndjeunia-Mbiakop^{1,2*}, Idriss Nasser Ngangue-Siewe^{2,3}, Badolo Athanase⁴, Roland Bamou⁵, Jeannette Tombi¹ And Christophe Antonio-Nkondjio^{2,6}.

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Background: Human IgG antibody response to *Anopheles gambiae* gSG6-P1 salivary peptide was reported to be a pertinent indicator for assessing human exposure to mosquito bites and evaluating the risk of malaria transmission. However, in the East region of Cameroon, no study using this tool to highlight how anthropological factors can affect human vector contact are available. In this study, we aimed to determine the anthropological factors favoring human-vector contact in the context of LLINs use, using the gSG6-P1 salivary peptide.

Methods: In October 2022 during the main rainy season, blood samples were collected from people living in Belabo and Ouami. A questionnaire was administered to people who had agreed to take part in the study, and their mosquito nets were collected. Malaria infection was determined using Rapid Diagnostic Test. The level of IgG Anti-gSG6-P1 response as a biomarker of human exposure to *Anopheles* bite, was assessed using enzyme-linked immunosorbent assay.

Results: Around 85% of the nets collected in the field had at least one hole, with a high percentage of damaged nets in both sites. Despite the fact that the difference was not significant between the level of antibody response and the status of the net, people with a damaged net had a higher IgG response than others. Comparison of the levels of IgG Ab response between *Plasmodium*-infected and uninfected individuals showed that this response was significantly ($p = 0.0206$) higher in the group of infected individuals than in uninfected ones. A significant difference ($p = 0.0103$) in IgG response to gSG6-P1 was observed between people who had vegetation around their house compared to those who did not have.

Conclusions: Parameters such as the presence of vegetation around houses, as well as the condition of the mosquito net, influence the level of exposure to mosquito bites and consequently the persistence of malaria.

Title: The Potential uses for AI in the Risk Assessment of Gene Drive Modified Mosquitoes

Justin Overcash, FNIH

Artificial Intelligence (AI) has the potential to revolutionize risk assessment by increasing efficiency and improving access to subject matter expertise. This talk will explore three key applications of AI in this context:

- Literature Analysis:** AI can rapidly identify, summarize, and analyze scientific literature using natural language processing, reducing the time needed to gather relevant information while enhancing accuracy and comprehensiveness.
- Problem Formulation:** AI can assist in identifying plausible pathways to harm by integrating diverse data sources, including genomic, ecological, and epidemiological data, to formulate research questions and guide risk analysis.
- AI as a Subject Matter Expert (SME):** AI agents have the potential to provide real-time, evidence-based insights, simulate risk scenarios, and suggest mitigation strategies. Once trained, they can be widely accessible at a low cost, improving SME access, particularly in developing countries.

Integrating AI into gene drive risk assessment has the potential to enhance efficiency, comprehensiveness, and accessibility, ultimately supporting more informed decision-making.

Title: Effects of Environmental Stress Factors at Larval Stage on Male *Anopheles Gambiae* Fitness

SETH O. AGYEI¹, DELPHINA A. GOMEZ¹, AND ABOAGYE-ANTWI, FRED^{1,2}

African Regional Postgraduate Programme in Insect Science, University of Ghana¹, Mosquito Ecology Research Facility, University of Ghana²

Several interventions have contributed to reducing the malaria burden, but further progress has stagnated, requiring new interventions, including gene drives. The success of such interventions depends on the fitness of released modified males to spread desirable traits within the population. However, the effect of larval rearing conditions on the life-history trait of the male *An. gambiae* s.l. is poorly understood. This study set out to investigate the effects of larval rearing density and larval food quantity on the fitness of male *An. gambiae* s.l.

Larvae were reared at three different densities (100, 200, and 400 larvae per 200 l of water), and fed 0.2 mg Tetramin®/larva/day. The feeding regime was varied at 0.1 mg, 0.2 mg, and 0.3 mg of Tetramin® fish food/larva/day for 200 larvae/litre of water to assess the effect of larval food quantity.

Larval rearing density affected developmental time ($P < 0.001$), pupation rate ($P < 0.045$), and adult male body size ($P < 0.001$) but not male mating success. Larval food quantity affected larval survival ($P = 0.002$), adult emergence rates ($P < 0.001$) and adult male body size ($P < 0.001$), but not survival. Overall percentage insemination of males from all the food quantity treatments was $3.37 \pm 0.69\%$. Males that were provided with 0.1 mg/larvae/litre/day had the highest insemination success ($4.00 \pm 0.70\%$).

These findings suggest an important role of environmental factors in modulating adult male fitness and could impact the success of approaches involving the release of male *An. gambiae*.

Title: Genetic Biocontrol: Ensuring Safe and Secure Development through Biosafety, Biosecurity and Biocontainment in Africa

Okorie Joseph Michael^{1,2}

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²National Biosafety Management Agency (NBMA), Abuja- Nigeria, okoriejoseph@gmail.com

Introduction: Africa is facing numerous challenges related to pests and disease management, which can have devastating impacts on agriculture, human health, and the environment. Genetic biocontrol, which involves the use of genetically modified organisms (GMOs) to control pests and diseases, holds great promises for sustainable agriculture and addresses many public health issues. However, the development and deployment of genetic biocontrol agents also raise concerns about biosafety, biosecurity, and biocontainment.

Aim: This study evaluated the importance of integrating biosafety, biosecurity, and biocontainment measures into the development and deployment of genetically biocontrol agents and also X-rayed the implications of new emerging genetic biocontrol technologies, such as gene drive and RNA interference technologies.

Methods: The study reviewed publications in English language made within the last 10 years (2014 - 2024) on different areas of this topic using Pubmed, Google scholar, Journals, book chapters and Web-links.

Result: The study showed that there is an urgent need to conduct risk assessment and management, review current regulatory frameworks, encourage public engagement and participation, conduct translational research and development of new technologies, biocontainment and confinement strategies in new and emerging genetic biocontrol technologies.

Conclusion: By addressing the biosafety, biosecurity, and biocontainment concerns associated with genetically modified biocontrol products, we can greatly tap into the full potential of these new and emerging technologies to improve public health via prevention and treatment of infectious diseases in Africa.

Keywords: Africa, Genetic Biocontrol, Biosafety, Biosecurity, Biocontainment, Risk Assessment, Regulatory Frameworks.

Title: Adoption of Biosafety and Biosecurity Standards for High-Containment Facilities in Low- and Middle-Income Countries Through Policy Harmonization

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Abstract: High-containment facilities play an important role in public health by enabling safe handling of highly pathogenic agents. They facilitate essential research on emerging infectious diseases, zoonotic disease, infectious disease surveillance, vaccine development among other biomedical and public health applications. However, low- and middle-income countries (LMICs) often find it difficult to implement sustainable biosafety and biosecurity standards due to inadequate personnel and government oversight. While international guidelines such as the World Health Organization (WHO) Laboratory Biosafety Manual and the Biosafety Level (BSL) guidelines provide a standard, their applicability in LMICs is very limited. In this abstract, we seek to explore the challenges faced by LMICs in setting up and maintaining high-containment facilities. In most cases, ethical concerns are raised when high-risk pathogen research is outsourced to LMICs without equitable capacity building, creating potential risks of biosafety breaches and biosecurity beyond their intended destinations. As the world faces increasing biological threats, we also propose the setting up of ethical governance mechanisms which ensure that developing countries are active stockholders through technology transfer and sustainable funding models and not merely used for outsourced research. This ethical governance will be aimed at closing biosafety and biosecurity gaps in LMICs through biosafety policy harmonization while maintaining scientific autonomy and regional collaborations that address unique contextual challenges.

Key words: Ethical Governance, Biosafety, low- and middle-income countries (LMICs), Biosecurity, High-containment facilities

Title: Effective Biosafety Systems on the Nitrogen Use efficiency, Water Use efficiency and Salinity Tolerant Genetically modified Rice Trial in Ghana

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Abstract: The increasing global demand for rice, coupled with challenges such as declining soil fertility, water scarcity, and salinity stress, necessitates innovative approaches to enhance productivity. At the CSIR-Crops Research Institute in Kumasi, Ghana, the objective of the experiment was to develop and evaluate genetically modified (GM) rice varieties with enhanced nitrogen use efficiency (NUE), water use efficiency (WUE), and salinity tolerance (ST) (NEWEST) for short. This study explores the role of effective biosafety systems in facilitating the safe development, testing, and adoption of these technologies. Using a comprehensive biosafety framework, the study ensures compliance with national and international standards for the containment, monitoring, and assessment of GM rice. The genetically modified lines were evaluated in controlled trials for their agronomic performance, including growth rate, grain yield, and resilience under low nitrogen, water-limited, and saline conditions. Advanced molecular techniques are employed to assess gene expression related to NUE, WUE, and salinity tolerance, while soil and environmental monitoring ensure minimal ecological impacts. Preliminary assessment shows that pre-planting inspection, planting and harvesting and post-harvest activities were done according to terms of reference given by the National Biosafety Authority, International standards and laws. Also, the results of the trial demonstrate significant improvements in nitrogen uptake efficiency, reduced water requirements, and sustained productivity under moderate saline conditions, compared to conventional varieties. The integration of these GM rice varieties into local farming systems could revolutionize rice production in Ghana, addressing key constraints faced by smallholder farmers. This study highlights the importance of robust biosafety systems in fostering public trust and regulatory compliance, ensuring that innovations in GM rice align with sustainable agricultural practices and food security goals in Sub-Saharan Africa. Further research and stakeholder engagement are recommended to facilitate scaling and adoption.

Keywords: Genetically modified rice, nitrogen use efficiency, water use efficiency, salinity tolerance, biosafety systems, sustainable agriculture.

Title: The Potentials of *Bacillus thuringiensis* Isolate and Its Cuticle-Degrading Enzymes Activity in the Biological Control of *Callosobruchus maculatus* in Stored Cowpea (*Vigna unguiculata* L. Walp)

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Background: The global post-harvest crop losses caused by insect damage are alarming, especially in developing countries. Currently there is a growing interest in exploring alternative health and eco-friendly biological control measures against the hazardous conventional synthetic chemicals. This study was conducted to assess the biopesticidal effect of *Bacillus thuringiensis* (*Bt*) isolate against *Callosobruchus maculatus* (Cowpea weevil) infesting stored cowpea (*Vigna Unguiculata*) seeds.

Methods: *Bt*-isolate obtained through liquid fermentation technology with sucrose water as substrate and as liquid medium was inoculated into talc powder to achieve solid medium. Six-month shelf-life study of the *Bt*-isolate solid medium was done using total microbial plate count. The insect mortality laboratory bioassay was done by direct contact through application of liquid and solid mediums of *Bt*-isolate to cowpea seeds containing first filial generation adults of *C. maculatus* and mortality counted for 12 and 7 days respectively. Enzyme activity was conducted using enzyme substrates.

Results: The shelf-life study revealed a gradual decline in the microbial count of concentrations of the solid formulation as time period increases. The insect mortality bioassay revealed that *Bt*-isolate liquid medium showed 100% mortality on the 8th day with 14.6×10^6 CFU/ml while the solid medium showed 100% mortality on the 5th day with 10.5×10^5 CFU/g and 12.6×10^5 CFU/g and also causes significant delay in the first-generation emergence period of *C. maculatus*. The enzyme activity study revealed that *Bt*-isolate produced cuticle-degrading enzymes with different enzyme activity.

Conclusion: This study concludes that *Bt*-isolate is effective against *C. maculatus* which may be as a result of the cuticle-degrading enzymes it produces and could be used as potential genetic bio-control agent in pest management of stored cowpea. However, higher concentrations will be required when producing solid formulation using talc powder so as to maintain adequate shelf life.

Title: The Central African Research and Health Ethics Committee (CERSAC): organisation, scope and challenges for better supervision and monitoring of biomedical and genetic biocontrol studies in Central Africa

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With the increasing number of studies on biomedical domain or applying biotechnology and genetic control on the continent, there is a growing need to reassure communities on the safety of research activities being conducted. This has pushed OCEAC to set up a committee to oversee issue related to ethics and biosafety in Central Africa. The Comité d'Ethique de la Recherche et de la Santé en Afrique Centrale (CERSAC) is a multi-country ethics committee whose primary mission is to ensure the ethical review of biomedical research involving human beings in the sub-region. Its secondary mission is to ensure the harmonisation of ethics review procedures, the accreditation of ethics committees and the promotion of bioethics (clinical ethics, public health ethics, environmental ethics) in the sub-region. CERSAC provides ethical review of research projects involving human beings conducted simultaneously in more than one country in Central Africa. CERSAC follows the guidelines established by the Declaration of Helsinki and the Council for International Organisations of Medical Sciences (CIOMS). CERSAC is also guided by regional and international treaties (International Conference on Harmonisation (ICH) Guidelines), human rights (Universal Declaration of Human Rights), standards and guidelines in accordance with internationally recognised ethical principles concerning research on human biological data and materials. The committee is made up of fifteen members who sit in an ex officio capacity. They meet regularly once a year at the general assembly. Evaluation sessions are organised in person or online every 3 months (4 sessions per year). This presentation provides an update on this committee organisation, scope, needs to address bioethical research challenges in the Central African sub-region.

Title: Design and Build of a BSL-3 laboratory facility and T&C of a laboratory

Dipl.-Ing. Claus Schweinheim, Managing Director, HT Lab Tec GmbH / Germany

For more 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, such as 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 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 built topic 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.

Title: Enhancing Biotechnology Frameworks in the East African Community (EAC) for Sustainable Development

Muyambi Fortunata, Deputy Executive Secretary, East African Science and Technology Commission, Kigali, Rwanda

Abstract: The East African Community (EAC) is an intergovernmental organization comprising Burundi, Kenya, Rwanda, South Sudan, Tanzania, Uganda, the Democratic Republic of Congo, and Somalia. With a population exceeding 330 million, the region has significant potential to harness biotechnology to address pressing challenges in food security, public health, industrialization, and environmental conservation. However, biotechnology adoption varies across member states, necessitating a harmonized regional approach to policy, regulation, and capacity building. This paper examines the role of biotechnology in sustainable development and proposes an integrated framework to enhance biotechnology governance in the EAC.

The East African Community (EAC) is at a critical juncture in leveraging biotechnology for sustainable development. Biotechnology presents transformative potential in agriculture, healthcare, industry, and environmental management. However, the region faces challenges in harmonizing biosafety regulations, fostering regional collaboration, and addressing ethical and legal concerns. This paper explores the role of biotechnology in advancing socio-economic development within the EAC and underscores the need for a comprehensive and coordinated regional biotechnology framework. The study highlights strategies for enhancing regulatory systems, strengthening research and innovation capacity, fostering public awareness, and aligning with international biosafety standards. Through regional cooperation, the EAC can create an enabling environment for biotechnology development that ensures economic growth, food security, environmental sustainability, and public health. The paper concludes with policy recommendations for an integrated regional biotechnology and biosafety strategy, emphasizing the importance of stakeholder engagement, infrastructure development, and investment in research and innovation.

The EAC Partner States have varying biosafety regulations, with some countries having well-established frameworks while others lack comprehensive policies. The absence of harmonized regulatory frameworks creates challenges in cross-border

biotechnology trade, investment, and risk assessment. Biotechnology research requires sophisticated laboratories, skilled personnel, and sustained funding. Many EAC countries face resource constraints, limiting their ability to conduct cutting-edge research and innovation. Public concerns over genetically modified organisms (GMOs), gene editing, and synthetic biology have led to resistance in some quarters. Ethical debates on genetic modification, intellectual property rights, and equitable access to biotechnology innovations further complicate policy formulation. A lack of public understanding of biotechnology and biosafety issues affects policy acceptance and implementation. Misconceptions about GMOs, bioengineering, and biosafety regulation contribute to hesitancy among consumers and policymakers. A well-coordinated regional biotechnology framework will position the EAC as a competitive player in the global biotechnology landscape while ensuring ethical and responsible biotechnology utilization.

Title: Communicating the uncertainties associated with genetic biocontrol approaches: the role of African Genetic Biocontrol Consortium.

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Abstract: Genetic biocontrol approaches, such as gene drive technology, is rapidly gaining interest from scientists and public health professionals due to their potential to overcome many challenges of current malaria control tools and strategies. This is particularly the case in Africa where the burden of malaria is most significant. Uncertainty exists about whether these approaches will work, how effective they might be, who is controlling them, and potential unintended consequences for human health and the environment. Therefore, efforts to enhance the understanding of genetic engineering and biotechnology are needed, to ensure that accurate information about this technology is disseminated in the media by science communicators including journalists and scientists. In this presentation, we review the outcomes from workshops and courses hosted by the African Genetic Biocontrol Consortium aimed at equipping communicators and journalists with skilful techniques to proficiently articulate the uncertainties associated with genetic biocontrol interventions to the African public. we discuss the gaps and provide insight on how communicators can address some of the basic challenges of developing effective communication and decision-making for genetic biocontrol approaches in Africa.

Title: Bridging the science communication gap: A look into the successes of the Media Science Cafes by Media for Environment, Science, Health, and Agriculture (MESHA).

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Background: Science plays a critical role in shaping societies, yet much of the knowledge produced by scientists remains inaccessible to the public. One of the key challenges is the communication gap between scientists and journalists, which results in a lack of widespread dissemination of important scientific findings.

Methodology: To address this issue, the Media for Environment, Science, Health and Agriculture (MESHA) introduced an innovative approach through “media science cafes.” These informal gatherings bring scientists and journalists together, fostering direct interactions and enabling scientists to break down complex research on different subjects into digestible information for diverse media outlets.

The cafes are designed to build trust, promote collaboration, and equip journalists with the tools needed to report accurate and engaging science stories to the public. The journalists are equipped with a Solutions Journalism (SoJo) angle-oriented way of putting together their stories.

Results: Well-sourced articles have been published through the MESHA owned Sayansi Magazine and/or both local and national media outlets in the country. More science and research institutions have collaborated with MESHA since 2015 by exposing their scientists and experts to a group of well-trained science reporters. The journalists are drawn from both urban and rural Kenya across all media with gender balance given adequate attention.

Conclusion: Media science cafes have created an environment for open dialogue and knowledge sharing between the scientific community and the media. By offering a platform where journalists can engage directly with experts, MESHAs has strengthened the communication pipeline, ensuring that critical scientific information reaches a wider audience. This model presents an effective solution to the longstanding communication barrier and highlights the potential for greater public engagement with science through media partnerships.

Title: Addressing the training needs for scientists, developers, communicators, regulators and other stakeholders for Genetic Biocontrol Products in Africa: progress made for Institutional Oversight Committees.

Cyrus Tareh, Scientific and Technical Coordinator, African Genetic Biocontrol Consortium

Institutional oversight committees which include Institutional Biosafety (IBCs), Animal Care and use (IACUC) and Ethical Review (ERCs) are committees created in an Institution in compliance with the laws, policies or regulations in a Country. These Committees reviews, approve and oversee research involving the use of genetically modified organisms (GMOs), recombinant or synthetic DNA/RNA and other biohazards. The Committees assists the Principal Investigator, supervisors, funders, and the relevant regulatory agencies with obtaining proper authorization for their studies. The Committees also approves procedures for procurement, use, storage, transportation, and disposal of research and products.

The African Genetic Biocontrol Consortium (The Consortium) has been hosting workshops for professionals from Institutions in African countries who are considering the use of genetic biocontrol technologies (which include gene drive/editing or synthetic biology) in their research and regulatory frameworks. Participants have included representatives from Competent regulatory agencies, the Committee Chairs and Principal Investigators (PI) from Institutions that include Institut de Recherche en Sciences de la Santé (IRSS), Burkina Faso; Noguchi Memorial Institute for Medical Research; Malaria Research and training Center, University of Science, Techniques and Technologies of Bamako (USTTB), Mali; Ifakara Health Institute, Tanzania; Uganda Virus Research Institute; Kenya Medical Research Institute (KEMRI), Kenya; International Livestock Research Institute (ILRI) KEMRI-Wellcome Trust Research Programme-Kilifi; Technical University of Kenya and the International Centre for Insect Physiology and Ecology (ICIPE).

The specific objective of this Symposium is to promote the professional development of oversight committee to participants from Institutions interested or that are currently involved in genetic biocontrol projects (which include gene drive/editing or synthetic biology) by providing an opportunity to learn about the existing international and national guidelines, best practices, and the range of responsibilities that oversight Committees have within the decision-making process in regulatory frameworks from the African context. Trainers will share with participants the scientific progress, Institutional frameworks available in their Institutions and countries in Africa and to understand the range of responsibilities that the IBC has within the decision-making process in Countries.

Title: Insights of stakeholders in Kenya on gene drive modified mosquitoes for malaria control and elimination

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Background: The fight against malaria continues to gain momentum with the development of new tools for vector control including Gene Drive technology. The need for the voices of key stakeholders during the developmental phase of this technology is crucial. The objective of the study was to have an in-depth conversation with key stakeholders in Kenya to gather insights on the country-specific needs, expectations and opportunities for gene drives and to explore stakeholder recommendations for effective malaria control and elimination.

Methodology: Focus Group Discussions were held with the various stakeholders. They included research scientists from academic and research institutions, youth groups, regulators, media/advocacy institutions, malaria control practitioners and community opinion leaders. The discussions were audio-recorded and transcribed on thematic areas.

Results: All the stakeholders were aware of the malaria situation in the country, contributing to high mortality, especially in children. The stakeholders concurred that GDM fits within the IVM strategy targeting malaria, and other MBDs and will complement existing strategies to reduce the burden of malaria. One of the key concerns raised was on mutation, safety and recall of the construct once released in the field. In addition, initial data from other African countries who have advanced

in the developmental pathway can be used to make decisions before deployment in Kenya. There is a need to use different approaches for replacement or suppression in different places, based on data on endemicity. Lastly the stakeholders recommended the development and harmonization of regulatory policies especially for cross-border issues and proper stakeholder involvement through the engagement of various government agencies and the community through local leaders with concise communication strategy.

Conclusion: GDMM has great potential in the fight against malaria. The concerns and recommendations from stakeholders need consideration for implementation and roll out in the near future.

Keywords: Malaria, GeneDrive, Mosquito

Title: From song to stories: assessing the impact of exposure to arts-based community engagement tools in shaping knowledge, attitudes, and acceptability toward the sterile insect technique in South Africa.

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Background: Community engagement (CE) has been recognized as pivotal in addressing challenges of trust, awareness, and participation. Sterile Insect Technique (SIT) is a novel genetic based vector control that relies on releasing millions of irradiated mosquitoes that's raises a lot of suspicion to communities. Therefore, effective community engagement is vital for its success. This study assessed the impact of arts-based approaches on community knowledge, attitudes, and perceptions of SIT in uMkhanyakude District, KwaZulu-Natal, South Africa.

Methods: A cross-sectional study was conducted with participants who had been exposed variably to arts-based methods, including songs, short stories, and drama., using structured interviews to assess the impact of CE on knowledge, attitudes, and perceptions of SIT. Logistic regression was used to evaluate associations between exposure and outcomes, adjusting for sociodemographic factors.

Results: Participants exposed to multiple arts-based methods demonstrated higher SIT knowledge scores than those with limited exposure. Statistically, exposure to arts-based approaches was significantly associated with higher knowledge (adjusted OR = 4.15, $p < 0.001$) and positive attitudes (adjusted OR = 2.04, $p = 0.073$). Community based events (94%) and the song (80%) were the most commonly cited community engagement methods. Overall acceptance of SIT was high (add #), with no difference was observed based on exposure type (unadjusted OR 1.43, $p = 0.522$; adjusted OR 1.38, $p = 0.625$). Similarly, demographics such as family history of malaria, age and gender were not associated with SIT knowledge, attitudes or acceptance.

Conclusion: Arts-based approaches enhanced community knowledge and attitudes toward SIT, highlighting their potential as culturally relevant engagement tools. Community participation and tailored communication strategies contribute to sustaining support for SIT programs. Our findings suggest that this should incorporate diverse engagement methods and address barriers to perception and acceptability to foster broader support for SIT implementation.

Title: Addressing misconceptions about genetically modified organisms' technology as it transitions from crop to livestock and human health in Africa

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Genetically modified organisms (GMOs) are promising to transform agriculture by enhancing food security, improving crop resilience, and reducing reliance on chemical inputs in Africa. However, widespread misconceptions—ranging from health and environmental concerns to fears of corporate control—continue to hinder their acceptance and progress. Meanwhile, some countries have made progress in various areas some at research and innovation, while others have commercialized both industrial and food crops to boost and sustain economic development. But technology is not static, the evolution of GMOs has progressed from agricultural applications to livestock improvements and now to human health interventions. This transition reflects the growing potential of biotechnology to address food security, disease control, and public health challenges. One of the most exciting recent developments is the application in controlling mosquito-borne diseases such as malaria.

This talk explores the key drivers of GMOskepticism in Africa, including cultural beliefs, regulatory uncertainties, and the origin of misinformation. We discuss evidence-based strategies for addressing these misconceptions, with a focus on empowering key stakeholders—scientists developing GMOs, policymakers shaping regulatory frameworks, and media professionals influencing public discourse. By fostering collaboration between researchers, government agencies, and the press, and by promoting transparent, culturally relevant communication, we can bridge the gap between scientific innovation and public perception. Equipping policymakers with accurate, science-driven information will be crucial in developing regulations that balance safety concerns with the need for agricultural innovation, ensuring that African farmers, consumers, and health practitioners can make informed choices about the value of biotechnology.

Title: Advancing LMO Risk Assessment and Risk management: Key Outcomes from COP-MOP 11

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Risk assessment and risk management are integral components of the Cartagena Protocol on Biosafety. Article 15 of the Protocol establishes the basic requirement for risk assessment under the Protocol and refers to Annex III for further guidance. Annex III sets forth the objectives of the risk assessment, what the risk assessment will be used for, general principles that the risk assessment must follow, the methodology of the risk assessment and particular points to consider when assessing the potential risks of LMO. Article 16 on Risk Management deals with the management of risks of those organisms that fall within the scope of the Protocol.

The Conference of Parties serving as Meeting of Parties to the Protocol in its eighth meeting in 2016 adopted “Guidance on Risk Assessment of LMOs” developed in response to Article 15 of the Biosafety Protocol. The main objective of the guidance is to provide a voluntary, non-prescriptive reference for Parties for conducting risk assessments under the Protocol in line with Annex III.

At the 11th meeting of the Conference of the Parties to the CPB (COP-MOP11), the Parties adopted new and voluntary guidance to assess living modified organisms containing gene drives. Other decision related to assessment of topics to be considered for development of additional guidance material as per the agreed criteria. Parties to the CBD also decided to develop a capacity-building action plan to help countries research, use and benefit from synthetic biology.

This session/presentation will discuss the key outcomes from the COP-MOP11 in the context of advancing LMO risk assessment and risk management.

Title: Strengthening the Regulatory and Legislative Frameworks for the Safe Deployment of Gene Drive Technology: Insights from Burkina Faso

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Malaria remains a public health challenge in Africa. The advent of genetically modified mosquitoes (GMMs) containing engineered gene drives offers a potential for transformative solution to overcome the limitations of traditional vector control methods. In Burkina Faso, researchers are advancing toward phase 3 trials, which involve the field release of GMMs, underscoring the urgent need to assess the readiness of the country's legislative and regulatory frameworks.

This study conducted in 2024 used desk reviews and stakeholder interviews to evaluate the biosafety, health and environmental regulations governing gene drive technology.

Findings revealed that while Burkina Faso has a functional National Biosafety Agency and protocols/guidelines for GMO management, some gaps remain in regulatory texts, such as the absence of officially adopted guidelines on environmental risk assessment for next phase of product development and deployment, and ethical governance frameworks of GMMs. Additionally, issues like insufficient public engagement mechanisms, poor understanding of the technology among stakeholders, and concerns about impacts on biodiversity were identified. Despite the information and awareness-raising efforts made so far, health regulators still have insufficient knowledge about GMMs as a potential vector control tool. The study highlights the need for strengthening inter-agency collaboration, developing a national strategy for biotechnology, biosafety and enhancing public awareness. Capacity-building for regulators and better domestication of existing international guidelines, such as those from the WHO and the Cartagena Protocol, are recommended to address these gaps. Furthermore, ensuring ethical rigor in clinical trials and preparing for informed public consultations are critical to maintaining transparency and trust.

Burkina Faso's experience provides a replicable framework for other African nations pursuing advanced biotechnological solutions to malaria. This work emphasizes the importance of science evolving with governance to ensure responsible development and deployment of genetically based vector control strategies to safeguard human health and environmental while combating malaria and other vector-borne diseases.

Keywords: Gene drive, genetically modified mosquitoes, regulatory frameworks, Burkina Faso, malaria elimination, stakeholder engagement.

Title: Developing genetic biocontrol policies and guidelines: Key to mitigating misuse and promoting public acceptance

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Background: Genetic biocontrol, involving the use of genetically modified organisms (GMOs) to control invasive species and diseases, holds great promise for mitigating ecological and economic harm. However, concerns surrounding unintended consequences, biosafety, and public acceptance requires an urgent need for the development of comprehensive policies and guidelines.

Aim: This review outlines the essential components of genetic biocontrol policies and guidelines, including risk assessment and mitigation strategies, regulatory frameworks and biosafety protocols, public engagement and participation mechanisms. It also showcases how monitoring, evaluation procedures and international cooperation contributes to harmonizing and enforcing genetic biocontrol policies and guidelines.

Methods: The study reviewed publications in English language made within the last 10 years (2014 - 2024) on different areas of this topic using Pubmed, Google scholar, Journals, book chapters and Web-links.

Result: The findings from the reviewed manuscripts showed that effective and well-tailored policies and guidelines can rapidly facilitate development and successful implementation of genetic biocontrol technologies while minimizing any potential risks and fostering public confidence.

Conclusion: Trust, fears, myths and concern of the general public on genetic bio-controlled technologies, its application and products can be worn by Scientists, if good and quality policy's and guideline are implemented to protect biodiversity, ecosystem services, and human wellbeing.

Keywords: Genetic Biocontrol, Policies, Guidelines, Risk Assessment, Regulatory Frameworks

Title: Building Capacity for Gene Drive Research: Empowering African Scientists and Communities

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As gene drive technology emerges as a promising tool for vector control, it is imperative to build local capacity to ensure its responsible and effective implementation in Africa. This symposium will focus on strategies for enhancing the skills and knowledge of African researchers and public health professionals in gene drive innovations. We will highlight successful capacity-building initiatives, including training programs, workshops, and collaborative research projects that have empowered local scientists to engage in gene drive research. Additionally, we will address the importance of interdisciplinary approaches that integrate molecular biology, public health, and community engagement to foster a holistic understanding of gene drive applications. By equipping African scientists with the necessary tools and knowledge, we can facilitate the development of ethically sound and socially responsible gene drive solutions that address the pressing challenge of malaria transmission in the region.

Title: Regulatory excellence in African Genetic Biocontrol

Simon Langat, AGBC Consultant, research management and ethics, simon.langat@protosconsulting.org

The science of genetics and manipulation of genes for different purposes is a wide discipline that is developing ever so fast. Most of the world's regions use genetically modified organisms for various purposes like enhanced food production, control of pests and production of medicinal products. It is imperative that all countries or regions develop capacity for regulating adoption and research to bring new products to the market. This paper aims to analyse the current needs of African countries to vet and approve the use of new products for human, animal and environmental health. Three issues that are critical for appropriate regulation, namely capacity to regulate, capacity to do research and capacity to distribute technology will be considered. This is a rapid desk review of the situation in a few selected African countries. Africa, endowed with abundant natural resources, is on the way to developing workable biotechnology industries. Currently most countries use biotechnology to reduce pests, control malaria spread, improve agriculture and manage invasive weed species. Presently, the major activities and experience indicates that the region needs to collaborate more, engage more with the rest of the world and exert herself more to claim her pride of place and provide for her youthful population in the 21st century and beyond.

Title: Building Synergistic Relationship between Ethics Committees and Biosafety Committees for Effective Governance of Genetic Biocontrol Technologies: Case of Kenya Medical Research Institute

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Background: Genetic biocontrol technologies continue to emerge; this leads to skepticism due to uncertainties especially on potential effects to humans and the environment. Ethics Committees (ECs) play a role of safeguarding rights, welfare, safety, and wellbeing of humans involved in research while Institutional Biosafety Committees (IBCs) provide oversight to research involving Genetically Modified Organisms (GMOs) to protect human health and environment. The Kenya Medical Research Institute (KEMRI), a state corporation mandated to carry out human health research in Kenya, has established several Institutional Review Committees to ensure a comprehensive oversight of its research projects. The KEMRI Scientific and Ethics Review Unit (SERU) hosts accredited ECs for research oversight. Recently, KEMRI established an IBC in a bid to provide oversight for GMO related protocols; the IBC's accreditation process is ongoing. Kenya lacks frameworks that links functions of IBCs to ECs despite the common goal of protecting humans and environment.

Aim: The objective of this paper is to describe a practical experience of KEMRI in building synergistic relationship for effective governance of genetic biocontrol technologies.

Method: This paper adopts a narrative inquiry approach where personal and institutional experiences are used as data sources.

Lessons from KEMRI: Over time, KEMRI SERU has reviewed research protocols focusing on emerging genetic biocontrol technologies such as "scientists proposing various tools and strategies to control malaria transmission". Recently, KEMRI established an IBC in line with the country's laws and regulations on biosafety committees. The inaugural committee is in the process of seeking accreditation from the National Biosafety Authority (NBA). The committee has incorporated bioethics experts while ensuring adherence to NBA requirements. In addition to the committee composition, working with SERU administratively will ensure proper coordination and efficiency in making informed decisions and providing seamless ethical

and biosafety oversight. It is envisioned that research protocols adopting genetic biocontrol technologies will be identified and reviewed concurrently. The two committees have overlapping but distinct roles, thus necessitating capacity building and allocation of roles and responsibilities to comply with best practices.

Conclusion: A Collaborative approach to regulation of genetic technologies through synergistic relationship between ECs and IBCs will enhance efficiency and effectiveness in the governance of genetic biocontrol technologies.

Recommendation: For effective governance of genetic biocontrol technologies, we recommend continuous joint capacity building activities of ECs and IBCs and a unified research regulation system where the two regulatory committees work together to protect humans and the environment.

Title: Risk assessment of GM Animals

Josephat Muchiri, National Biosafety Authority, Kenya

Genetically modified (GM) animals are those where their genetic material has been altered using a method that does not occur naturally, but excluding chemical and physical mutagenesis. All GM animals must be risk assessed. Risk assessments of genetically modified organisms (GMOs) are designed to assess their potential risks to humans, other animals, and the environment. The process involves identifying potential hazards and estimating exposure to those hazards. It's founded on the principle of science-based, case by case assessment, and based on comparisons between the GM and the non-GM counterparts. Regardless of the GMO, the process entails identification of potential hazards, evaluation of likelihood, an evaluation of consequences, an estimation of the overall risk, a recommendation of whether the risks are acceptable or manageable including where necessary identification of mitigation measures. In instances where there are uncertainties, additional information may be requested or instituting risk mitigation measures. Some of the potential hazards in GM animals include; persistence, horizontal gene transfer, gene stability, loss of biodiversity, toxicity and allergenicity. It's the primary responsibility of a technology developer to demonstrate safe of the GM animal y undertaking risk assessment of the GMO of interest using well established international standards and avail the data to regulators. Regulators on the other hand review the data or may decide to engage independent risk assessors to evaluate the submitted biosafety data. At the end of a risk assessment process, risk assessors avail the information to decision makers who either approve with or without conditions, decline with reasons, or seek additional data before a final decision is made.

Key words: GM animals, risk assessment, hazards, safety

Title: How might we use information on the spread of insecticide resistance genes to predict the potential spread of gene drives?

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Gene drive approaches to malaria control have the potential to be extremely efficient because they will be spread by the mosquitoes carrying them from one location to another. There is some uncertainty in the expected rate of spread of these gene drives due to uncertainties about mosquito movement patterns and about what taxonomic or geographical discontinuities may stop their spread. Traditional vector control relies on the use of insecticides, which in turn has led to the widespread and well-studied evolution of insecticide resistance (IR) genes. In principle, the spread of IR genes should be a useful precedent for predicting the spread of gene drives, as both will depend on patterns of mosquito movement and the nature of species boundaries. In this talk, I will review some of the findings from studies of IR genes that are relevant to predicting the spread of gene drives. I then demonstrate how the current distribution of insecticide resistance genes can, in principle, be used to estimate typical rates of movement by mosquito species.

Title: SEPARATOR and NextGenSIT are novel tools for safe and efficacious elimination of *Anopheles* malarial mosquitoes.

Speaker: Nikolay Kandul, PhD, nikolay@synvect.com

Abstract: Mosquito numbers and cases of mosquito-borne diseases have surged in recent years due to growing mosquito insecticide resistance, climate warming, and global trade and travel. The urgency of the mosquito problem revived the interest in biological approaches for mosquito suppression, such as Sterile Insect Technique (SIT) and *Wolbachia* Insect Incompatibility Technique (WIIT) as well as novel Genetic Modification (GM) approaches. Unfortunately, no methods currently exist for effective sex-sorting, production, delivery, and deployment of *Anopheles* mosquitoes, preventing the scalable application of any biological approaches, including Gene Drives, for control of *Anopheles* malaria mosquitoes.

At Synvect, we developed two GM tools enabling effective elimination of *Anopheles gambiae*: SEPARATOR and NextGenSIT. SEPARATOR enables high-throughput and high-precision sex-sorting of early mosquito larvae. NextGenSIT combines the safety of traditional SIT with the precision and efficacy of CRISPR gene knockouts. The CRISPR components are separated into two GM mosquito strains, each expressing Cas9 or guide RNAs. The genetic cross between the strains results in the eggs that develop hands-free into sex-sorted and sterilized male mosquitoes. The production and deployment of eggs allow for more cost-efficient and efficacious suppression of mosquitoes. In addition, due to precision-guided genetic knockouts, NextGenSIT consistently leads to mosquito male sterility and does not sacrifice male fitness, longevity, and competitiveness in the environment. Both SEPARATOR and NextGenSIT are technology platforms and have been already developed and validated for *Aedes aegypti* and *Anopheles gambiae* mosquitoes in the laboratory settings.

The full application of SEPARATOR has already been approved in the USA; while NextGenSIT, unlike Gene Drives, is fully contained and regulated at the one-country level facilitating its regulatory approval. We are proposing to (i) incorporate SEPARATOR into African SIT, WIIT, and GM programs, and (ii) pilot NextGenSIT in Africa using the contained setting, such as large outside cages before deploying it in open-air.

Title: Rapid evolution of insecticide resistance and patterns of pesticides usage in agriculture in the city of Yaoundé, Cameroon

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Presenter: Nadège Sonhafouo Chiana

Background: The practice of agriculture in urban settings contributes to the rapid expansion of insecticide resistance in malaria vectors. However, there is still not enough information on pesticide usage in most urban settings. The present study aims to assess the evolution of *Anopheles gambiae* (s.l.) population susceptibility to insecticides and patterns of pesticide usage in agriculture in the city of Yaounde, Cameroon.

Methods: WHO susceptibility tests and synergist PBO bioassays were conducted on adult *An.gambiae* (s.l.) mosquitoes aged 3 to 5 days emerging from larvae collected from the field. Seven insecticides (deltamethrin, permethrin, DDT, bendiocarb, propoxur, fenitrothion and malathion) were evaluated. The presence of target site mutation conferring knockdown (*kdr*) resistance was investigated using TaqMan assay, and mosquito species were identified using SINE-PCR. Surveys on 81 retailers and 232 farmers were conducted to assess general knowledge and practices regarding agricultural pesticide usage.

Results: High resistance intensity to pyrethroids was observed with a high frequency of the *kdr* allele 1014F and low frequency of the *kdr* 1014S allele. The level of susceptibility of *An. gambiae* (s.l.) to pyrethroids and carbamates was found to decrease with time (from > 34% in 2020 to < 23% in 2022 for deltamethrin and permethrin and from 97% in 2020 to < 86% in 2022 for bendiocarb). Both *An. gambiae* (s.s.) and *An. coluzzii* were recorded. Over 150 pesticides and fertilizers were sold by retailers for agricultural purposes in the city of Yaounde. Most farmers do not respect safety practices. Poor practices including extensive and inappropriate application of pesticides as well as poor management of perished pesticides and empty pesticide containers were also documented.

Conclusions: The study indicated rapid evolution of insecticide resistance and uncontrolled usage of pesticides by farmers in agriculture. There is an urgent need to address these gaps to improve the management of insecticide resistance.

Keywords: Vector control, *Anopheles gambiae*, Insecticide resistance, Pesticide management, Yaounde, Cameroon

Title: Strategic Control of Malaria: A Data-Driven Approach for Targeted Interventions in Yaoundé

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Background : The prevalence of malaria in sub-Saharan Africa has fallen significantly over the last decade, particularly in urban areas such as Yaoundé, Cameroon, mainly due to the widespread adoption of vector control. However, this laudable progress has come up against a formidable hurdle, and many persistent problems continue to hamper malaria control efforts. This study assesses the influence of malaria control methods and environmental factors on transmission dynamics in order to guide targeted interventions using advanced spatiotemporal modelling.

Methods: We use a spatiotemporal generalised additive model (GAM) to analyse vector malaria transmission data collected in different neighbourhoods of the city of Yaoundé. The model incorporates environmental variables such as rainfall, temperature, humidity and vegetation indices, as well as indicators of intervention coverage such as the distribution of insecticide-treated mosquito nets and house spraying. Geospatial and temporal correlations were taken into account to capture the dynamic nature of malaria transmission.

Results: Preliminary results show that environmental factors and intervention coverage significantly influence malaria transmission patterns in Yaoundé. Rainfall and temperature show non-linear relationships with vector infection, while the effectiveness of interventions varies between neighbourhoods. Transmission foci were identified, highlighting areas requiring enhanced control measures. Final results, including detailed spatial and temporal trends, will be available within six months.

Conclusion: This study highlights the importance of integrating environmental and intervention data into malaria control strategies. By exploiting spatiotemporal models, it is possible to identify high-risk areas and optimise the allocation of resources for targeted interventions. These findings are intended to improve malaria control efforts in Yaoundé and to serve as a framework for similar urban contexts in endemic regions.

Title: Does Suppressing *Anopheles Gambiae* Impact Pollination Service? A Case For Balancing Ecology And Public Health

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Insect pollination is essential for global food security, yet globally, populations of key pollinators are declining. While the role of bees and butterflies in pollination are well studied, the role of non-Syrphid flower-visiting flies including the malaria vector; *Anopheles gambiae* s.l., remains largely overlooked. *Anopheles gambiae* s.l. feeds on flower nectar and thus a potential pollinator. However, all malaria control efforts focus on reducing *An. gambiae* s.l. populations, raising an important question: could suppressing this mosquito species impact pollination and plant reproduction?

To investigate this, we introduced *An. gambiae* to 11 plant species in a controlled environment over a 24-hour period and conducted field surveys. The mosquitoes collected pollen but overwhelmingly preferred leaves and stems when given a choice ($P=0.031$) suggesting their limited role in pollination. We collected 783 individual mosquitoes from the field and observed them under light microscope for pollen attachment, but found none. We also conducted a 19-month field survey of insect flower-visitors across different habitats in two Ghanaian farming communities. We recorded 20,370 insects from 254 species which visited 65 plant species. After 608 hours nocturnal sampling effort, we found no *An. gambiae* visiting flowers in the wild. Bipartite network analysis revealed that *An. gambiae* plays an insignificant role in pollination as it was not found visiting any flower in the study area, suggesting its decline is unlikely to disrupt plant reproduction. These findings provide critical insight into the ecological impact of malaria control. While pollinator loss is a global concern, suppressing *An. gambiae* for public health reasons appears unlikely to harm pollination networks.

Title: Effects of Larval Rearing Background Colour on *Anopheles Gambiae* FitnessJOVID OKINE¹, NAANA A. AQUAAH¹, BERNARD A. ADAMS¹, EVA D. OFORI¹, SAMUEL A. AMOAH¹, THOMAS GYIMAH¹, FRED ABOAGYE-ANTWI¹*Mosquito Ecology Research Facility (Target Malaria Ghana) University of Ghana¹*

Different mosquito species select different oviposition background colour. However, the effects of larval background colour on mosquito fitness are not well understood. We hypothesize that, larval background colour affects mosquito fitness, hence, their ability to transmit diseases. In view of this, we investigated the effect of two larval rearing background colours on *An. gambiae* survival and body size.

Four hundred (400) individuals of *An. gambiae* s.l larvae each, were reared in two different tray colours; grey and white, with dimension, 58cm×39cm×6.5 filled with two litres of dechlorinated water. Each treatment had three replicates and the experiment was repeated three times under control and standard laboratory conditions (27°C and 80% humidity). We recorded daily larval mortality, pupation, adult emergence and adult mortality, as well as the adult body size.

Daily pupation was significantly higher ($P=0.0001$) in the grey larval rearing background while, daily larval and pupal mortalities were significantly higher in the white larval rearing background. Mosquitoes from the grey larval rearing background were significantly bigger, however, both daily adult emergence and mortality were also significantly higher ($P=0.0001$) in mosquitoes from the same rearing background.

Findings suggest that the grey larval rearing background shortens *Anopheles gambiae* s.l developmental time, as well as their longevity.



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