Current Biotechnology Research at Centre for Biotechnology and Bioinformatics and its impact on the Biological & Toxin Weapons Convention (BWC)

Who we are  What we do  Impacts on the BWC

Dr. George Obiero, PhD
Director
Centre for Biotechnology and Bioinformatics (CEBIB)
University of Nairobi

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Who we are

• Founded in 2005 as a virtual centre for Research and Postgraduate Training (MSc & PhD)
• Thin core staff at the Centre
• Faculty drawn from Schools and Departments within the University and collaborating Institutions
• Based at the University of Nairobi, Kenya

Our Core Functions

- Teaching and Learning
- Research
- Consultancy
- Community Service

Thematic Research Areas

- Health Biotechnology
- Agricultural Biotechnology
- Industrial Biotechnology
- Bioinformatics application in Biotechnology
Global challenges: Is there Need for Local and International collaborations?
Some of the major challenges

How safe is Kenya’s ugali?

Inadequate drying and storage in damp conditions provide the right condition for mould.

For Kenya, aflatoxin contamination is a long-standing problem. The country is considered a world hotspot, with incidents of acute toxicity recorded in 2004 and 2010.

Ugali is traditionally eaten with your hands

Several well-known brands of maize flour have been taken off supermarket shelves in Kenya, after a warning about unsafe levels of a poisonous substance known as aflatoxin.
Pathway towards Research / Solving the challenges

- Government Regulator
  - National Biosafety Authority
  - National Commission for Science, Technology and Innovation

- Institutional Research Policy
  - Institutional Biosafety Committee

- Project/Research
Need for optimised Microbial industrial processes using fermentation technology

State-of-the-art 5L twin Braun Biostat B with controlled parameters being used to scale-up liquid fermentation process from shake flasks

Bioprospecting for microbial biocatalysts for Integrated Process Technologies in using agricultural wastes
Dan Ojwang, Francis Mulaa, George Obiero, Jacob Midiwo, Moses Makoyoto
Aflatoxin Testing and Research in Human Food and Animal feed

Aflatoxin Proficiency Testing Training in collaboration with relevant stakeholders and Counties

- The main fungi are *Aspergillus flavus* and *Aspergillus parasiticus*
- Test for toxins from microbial sources
Solving Reduced Plant Yields Using Biotechnology Tools

Mutagenomic analysis of groundnut RNA viruses in Western Kenya using high throughput sequencing technologies
Dennis Obonyo¹, Damaris Odeny², Rachel Ikawa³, George Ouma⁴

Bioprospection and characterisation of Microbial Biofertilizers and pesticide degraders from different agro ecological zones of Malawi
Samuel Mwafulirwa, Gabriel Aboge, George Obiero, Placid Mpeketula

Tissue culture laboratory – Transformation of yams towards drought resistance

Collaborative research done at
Featured Animal Research Using Biotechnology Tools

Gunga Patrick, Dr. George Obiero, Dr. Gabriel Aboge)

Molecular Epidemiology of Foot and Mouth Disease Virus circulating in the African buffalo and Cattle population in eastern RWANDA
Udahemuka Jean Claude, Gabriel Aboge, George Obiero, Phiyani Lebea

Use of Molecular and other rapid diagnostic methods for detecting and evaluating Rabies Viruses circulating in Mali.
Mounirou Camara, Gabriel Aboge, George Obiero, Ousmane Koita
Institutional management of risks associated with Biological Research - A case of CEBIB

- University research policy document in place to guide safe research
  - Institutional Biosafety Committee in place
- Reviewing of curricula at all levels to promote ethical science
  - Curriculum with aspects on biosecurity for post graduate course in place
- Capacity building, Staff enrichment and Journalism club for students
  - Staff active in relevant regulatory Technical committees
  - Biosafety and Biosecurity issues during student orientation
- Collaboration with other Institutions
- Strengthening the teaching of biosciences at the formal education level.
- Developing scientific and related infrastructures.
- Attracting and retaining talent in biosciences.
- Spearheading formal and informal public education and awareness creation programs.
Centre for Biotechnology and Bioinformatics (CEBIB)

➢ Collaborating institutions
  • KEMRI-Wellcome Trust, KEMRI, KEMRI-CDC, International Centre of Insect Physiology and Ecology (ICIPE), International Livestock Research Institute (ILRI), Ohio State University, University of Manitoba