ISAAC CARILO
(MPhil Student)-Molecular Cell Biology of Infectious Diseases

UNIVERSITY OF GHANA

West African Centre for Cell Biology of Infectious Pathogens

African Centre of Excellence for Higher Education

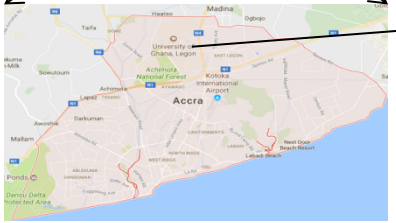
College of Basic and Applied Sciences

GEOGRAPHICAL LOCATION

WORLD MAP

GHANA

ACCRA



DEPARTMENT OF BIOCHEMISTRY, CELL AND MOLECULAR BIOLOGY, UNIVERSITY OF GHANA

Department of Biochemistry, Cell and Molecular Biology
Volta Rd
Accra

LONG TERM SCIENTIFIC GOALS

- Elucidation of drug resistance/stress response mechanisms in infectious pathogens confronting the Sub-Saharan Africa.

- Discovery of novel therapeutic agents for infectious diseases. Eg. Tuberculosis, Malaria, Candidiasis, Bacterial infections

Laboratory for Chemical Systems Biology of Infectious Pathogens (LCSBIP).

RESEARCH QUESTIONS AT LAB.

- Elucidating drug resistance/stress response mechanisms of infectious pathogens at the system-wide level using mass spectrometry-based proteomics
  - *Mycobacterium tuberculosis*, bacterial infections
  - *Candida albicans*, *Streptomyces cerevisae*
  - *Plasmodium falciparum*

- Bioassay-guided isolation of novel next generation bioactive compounds from fungal sources
  - Marine Endophytic fungi
  - Wood decay fungi
  - Soil Borne Fungi
  - Terrestrial endophytic fungi

RESEARCH QUESTION (MPhil PROJECT)

- Investigations into the mechanisms of anti-mycobacterial drug resistance using antipsychotic compounds.

Tubercle bacilli

- Unique features of the Laboratory
  - Largest collection of fungal cultures in Ghana
  - Active extracts with cross bioactivity

UNIQUE SKILLS ACQUIRED

- Extraction of secondary metabolites from fungal cultures
- Microbiology techniques (culturing, transformation etc)

- Kupchan Solvent partitioning
  - Partitioning of extracts into 7 different fractions

- Preparative and Analytical Thin layer Chromatography (TLC)
  - For sub-fractionations of extracts

CHALLENGES WITH RESERACH

- Ultra-high throughput screening technologies.
- Need for LC systems and liquid equipment and complete set up for separation of organic compounds
- Availability of equipment for system-wide analysis of stress-induced organisms (eg. Mass spectrometry).
- Structural resolution and quantification techniques of extracts (Nuclear magnetic Resonance, HPLC)
- Space

COLLABORATION

- State-of-the-art high throughput screening
- Current trends in structural elucidation approaches and techniques
- Training and innovation

ACKNOWLEDGEMENTS

- Superb contributions from **MeBoP** course coordinators and organizers.

- Home institution (Department of Biochemistry, Cell and Molecular Biology, University of Ghana)

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WACBIP

- Peer Groups of **MeBoP** course, 2017,

THANK YOU FOR YOUR ATTENTION