

Ifedayo Victor Ogungbe, PhD
Associate Professor
Department of Chemistry
The University of Alabama in Huntsville

CONTACT

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EDUCATION

- Scripps Research Institute, FL
Postdoctoral Research Associate, 2012
- The University of Alabama in Huntsville, AL
Ph.D. Biotechnology Science and Engineering, 2011
M.S. Chemistry, 2009
- Adekunle Ajasin University, Nigeria
B.Sc. (Hons). Biochemistry, 2005

SCIENTIFIC INTERESTS

Drug Discovery for infectious diseases, cancer, and crop protection; Drug target identification; chemical proteomics and lipidomics.

EXPERIENCE

Jackson State University, Jackson, MS, <http://www.jsums.edu/chemistry/ogunge/>

Department of Chemistry, Physics, Atmospheric sciences (formerly Chemistry and Biochemistry)

Assistant Professor (January 2013-April 2019)

Associate Professor (April 2019-April 2023)

Professor (April-August 2023)

Current Research, Teaching, and Service Responsibilities:

- **Teaching responsibilities:**
 - Graduate-level biochemistry, physical organic chemistry, and medicinal chemistry course
 - Undergraduate organic chemistry, biochemistry, and qualitative organic chemistry laboratory courses

COURSE NUMBER AND TITLE

CHEM 242 Organic Chemistry I and II

CHML 242 Organic Chemistry I and II Lab

CHEM 243 - Qualitative Organic Analysis

COURSE NUMBER AND TITLE

CHEM 380 Independent Study
 CHEM 381/481/711: Chemistry Seminar
CHML 431 Biochemistry I Lab
CHEM 431 Biochemistry I
CHEM 531/731 Graduate Biochemistry and
Advanced Biochemistry
CHEM 580 Thesis Research
CHEM 780 Dissertation Research
CHEM 436/536/736 Physical Organic Chemistry
CDSE 700 Seminar in Computational Science and
Engineering
CHEM 788 Medicinal Chemistry

- **Current Research**

My research interests are in discovering and developing new bioactive agents into therapeutic agents for infectious diseases, crop protection and, recently, cancer therapeutics. The central theme is in using natural product scaffolds – enabled by synthesis and isolation - to perform structure-based drug design, complemented by biochemical and pharmacological investigations of the compounds. The research is being pursued in two areas these include i) phenotype-driven and structure-based drug design and ii) anti-infective natural products-based lead discovery.

The research projects are summarized below:

1. Cysteine Protease Inhibitors as Antiparasitic Agents

One of the main projects in our lab is the pre-clinical investigation of cysteine protease inhibitors as antiprotozoal agents. Diseases caused by trypanosomes and leishmania, endemic in South America and Sub-Saharan Africa, impact millions of people yearly. In the past few years, we have identified new and selective cysteine protease inhibitors of trypanosomes based on natural products-based covalent protease inhibitors [Figure 1]. The ADME properties and *in vivo* (mice) efficacies of the compounds are currently being investigated. We have developed active collaborations with colleagues at New York University and Instituto Oswaldo Cruz-Brazil to help facilitate this project. The project is currently supported by NIH.

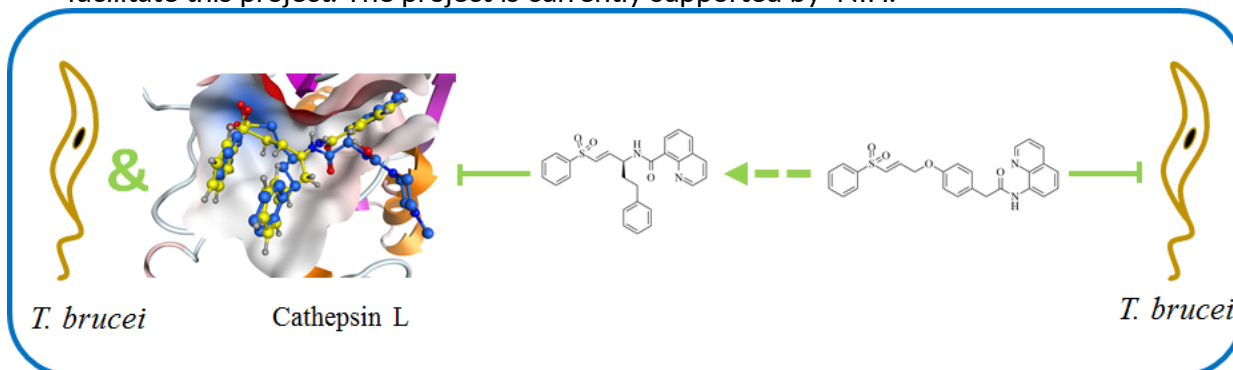


Figure 1: Covalent inhibitor of trypanosomal cysteine protease.

2. Inhibitors of the Non-Structural Protease of Alphaviruses

Emerging viral infections caused by alphaviruses and flaviviruses have increased in recent times [5]. Using our in-house libraries and experience with trypanosomal proteases, we initiated a project on Chikungunya and Venezuelan equine encephalitis viruses, and we have found a couple of unprecedented hit compounds against the viruses [6]. The project has morphed into a structure-based design project where multiparameter optimization strategies that include phenotypic screening, in silico simulations, and ADME profiling are used to guide design. This project was pursued in collaboration with The United States Army Medical Research Institute of Infectious Diseases and currently with National Institute of Allergy and Infectious Diseases. The project is currently supported by NIH.

3. Anti-infective Natural Products Based Lead Discovery

Natural products have been particularly useful in anti-infective drug discovery, perhaps due to eons of natural competition between producers of natural products and pathogens in the ecosystem. Over the centuries, especially in the past 80 years, we have explored and adapted chemical structures present in natural products as drugs or as inspiration for new synthetic compounds as drugs. Our research group has been investigating natural products from Costa Rican and Lower Guinean plants initially through the support of the Burroughs Wellcome Fund and recently through NIH support.

- We have been able to assemble a plant extract library and a soil library for fungi isolation and cultivation. The plant and fungi species from the Lower Guinean Forests are largely unexplored at the structure-activity/pharmacology level.
- We have also assembled natural products scaffolds for drug design and development of screening libraries.

This research theme's pharmacological/therapeutic focus is diseases caused by the protozoan genera *Trypanosoma*, *Plasmodia*, and *Leishmania* species. Our approach in this research theme is natural products and semi-synthetic derivatives [Figure 2] that can be clinically developed and are truly selectively efficacious against infections caused by protozoans. Diseases caused by those organisms are of significant global health importance.

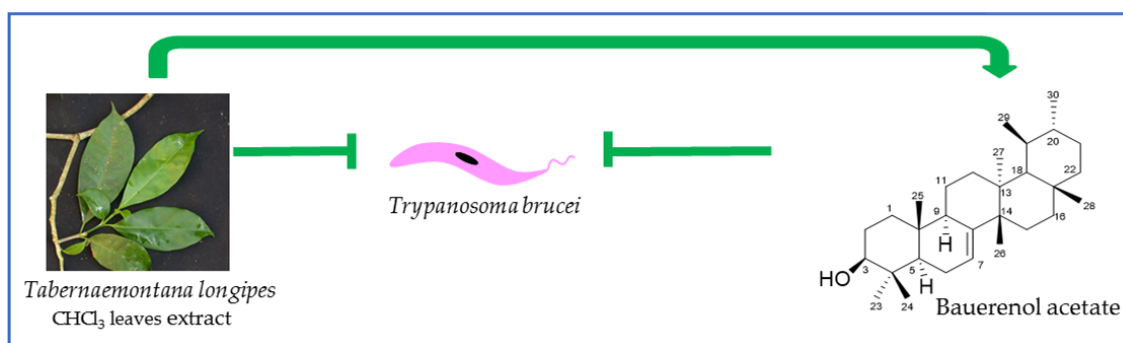


Figure 2. Isolation and investigation of an antitrypanosomal pentacyclic triterpenoid from *T. longipes*.

- Current research advisor to 4 Post-Doctoral Research Associates, 2 Ph.D. candidates, and 2 undergraduate students
- Served as major professor of 3 PhD and 6 M.S. graduates, and research advisor for 32 B.S and K12 graduates

- Faculty Manager, Departmental NMR Laboratory
- **Service:**
 - Site coordinator for the Louis Stokes Alliance for Minority Partnership Undergraduate Program (LSMAMP) at Jackson State University (2013-2023)
 - Co-PI of the LSMAMP Bridge to the Doctorate Program (2018-2023)
 - Research mentor in NSF RISE and PREM programs
 - Serve on the department's safety, recruitment, and retention, and graduate admission committees
- **Student Supervised**

a. **Supervision of MS Students (Jackson State University)**

	Name	Program
1.	Alzomat, Mahmoud	MS Chemistry (December 2019)
2.	Nemati, Maryam	MS Chemistry (May 2018)
3.	Tierra Jefferson	MS Chemistry (December 2016)
4.	Zachery Glenn	MS Chemistry (August 2016)
5.	Samira Carothers	MS Chemistry (Transferred)
6.	Jasmine Collins	MS Chemistry (May 2015)

b. **Supervision of PhD Students (Jackson State University)**

	Name	Program
7.	Jasmine Collins	Chemistry, PhD (Spring 2020)
8.	Huasheng Zhang	Chemistry, PhD (Spring 2020)
9.	Rogers Nyamwihura	Chemistry, PhD (Fall 2021)
10.	Denise Yancey	Chemistry, PhD (In Progress)
11.	Oluwatomi Ajayi	Chemistry, PhD (In Progress)

c. **Thesis Student Committee Membership (Jackson State University)**

	Name	Program
1.	Briana Ross	MS Chemistry (Summer 2021)
2.	Amber Gardner	MS Chemistry(Fall 2019)
3.	Parks, Ebony	MS Biology (May 2018)
4.	Hammond, Neil	MS Chemistry (Current)
5.	Omkan Menon	MS Chemistry (May 2017)
6.	Bobby Portis	MS Chemistry (Dec 2016)
7.	Ansley Scott	MS Biology (May 2015)
8.	Cord Carter	MS Chemistry (May 2015)
9.	Alexis Ellis	MS Chemistry (May 2015)

d. **PhD Students Committee Membership (Jackson State University)**

	Name	Program
1.	Taylor Dorlus	PhD Chemistry (In Progress)
2.	Jing Qu	PhD Chemistry (In Progress)

3.	Mbemi, Ariane	PhD Environmental Science (December 2019)
4.	Andrea Brown	PhD Environmental Science (December 2019)
5.	Rui, Xu	PhD Chemistry (August 2019)
6.	Ubani Ogbonnaya	PhD Civil Engineering (May 2018)
7.	Kapusta, Karina	PhD Chemistry (May 2018)
8.	Sakeli Hall	PhD Environmental Science (December 2015)
9.	Thomas Ondera	PhD Chemistry (December 2015)
10.	Noura Dosoky	PhD Biotechnology Science (UAH, May 2015)
11.	Cassandra McCullum	PhD Chemistry (December 2014)
12.	Antrice Walker	PhD Environmental Science (May, 2014)

Biomolecular Sciences, LLC, Huntsville, AL; <https://www.biomolecularscience.org>

Managing Partner (February 2019-Present)

- Provides cheminformatics services
- Research partnership on small molecule and biologics for infectious disease and crop protection.
- Design analogs of hit compounds using open source and propriety databases and resources
- Perform cloud/cluster/single machine-based simulations for pharmacophore QSAR, molecular docking, M.D. simulations using AWS (EC2, Batch S3, and Workspaces)

The Scripps Research Institute, Jupiter, FL

Department of Metabolism & Aging

Research Associate (August 2011 - December 2012)

Research and Service:

- Led projects that involved characterizing a). the endocannabinoid biosynthetic enzymes in *C. elegans*, b). the physiological action of endocannabinoids in *C. elegans*, and how endocannabinoid levels affect fat metabolism and aging in *C. elegans* using GCMS and c). the effect of bioactive natural products on *C. elegans*.

University of Alabama in Huntsville, Huntsville, AL

Department of Chemistry

Graduate Teaching & Research Assistant (August 2007-July 2011)

- Supervised and conducted experiments with undergraduate students in organic -, introductory chemistry and biochemistry
- Assisted faculty in teaching and planning course outlines for biochemistry and analytical chemistry laboratory class
- Led research projects on drug-lead discovery using computational, analytical, and synthetic organic chemistry tools. I was responsible for designing experiments, analyzing data, and writing technical reports and manuscripts for publication.

Radiance Technologies Inc., Huntsville, AL*Project Consultant and Analyst (2009 -2010)*

- Investigated the national infrastructural capacity of the Republic of Benin and Nigeria to tackle animal and zoonotic disease outbreaks and pathogen detection. I was responsible for interviewing technical personnel on the veterinary response to zoonotic/animal diseases and environmental compliance.
- Assembled and directed multi-disciplinary teams to visit disease-endemic hot zones and collect information pertaining to national, regional, and local emergency management procedures/plans for zoonotic disease outbreaks, was responsible for obtaining the technical, policy, and informational documents related to zoonotic diseases and environmental compliance.
- Obtained invaluable knowledge on mediating and resolving internal conflicts between team leads and prioritizing research objectives in accordance with set milestones and deadlines.
- Prepared technical reports and executive summaries that were used for project evaluations and that could also serve as final project deliverables.

Delta State University, Abraka, Nigeria

Department of Biochemistry

Teaching/Research Assistant (September 2006-August 2007)

- Designed and performed drug toxicology experiments in animal models.

UNIVERSITY, COLLEGE, PROFESSIONAL SERVICES AND ACTIVITIES• **University**

- a. Member, Graduate Studies Council, Jackson State University, 2019-2021
- b. Chair, Institutional Biosafety Committee, Jackson State University 2022 – 2023
- c. Member, Radiation Safety Committee, Jackson State University, 2021 – 2023

• **College**

- a. Member, College Promotion and Tenure Committee, Jackson State University , 2019-2022

• **State**

Chair and Vice-Chair, Division of Chemistry and Chemical Engineering, Mississippi Academy of Sciences 2018 and 2019

• **National/International**

- a. **Journals:** Journal of Medicinal Chemistry, ACS Biochemistry, ACS Omega, ACS Chemical Research in Toxicology, ChemMedChem, Molecules, Mini-reviews in Medicinal Chemistry,

Phytochemistry, Natural Products Research, Computational Chemistry and Biology, PeerJ, Experimental parasitology, Journal of Molecular Graphic and Modeling, PLoS NTDS, Database (Oxford Press), Journal of Ethnopharmacognosy, Evidence-Based Complementary and Alternative Medicine, Research in Veterinary Science.

b. Editorial Board Member:

Molecules (*Natural Products Section*); Frontier in Pharmacology (Topic Editor)

c. National Institutes of Health:

- 2021: Member, NIH Applied Immunology and Disease Control (AREA, ZRG1 AIDC-S 80) Special Emphasis Panel
- 2021, Special Emphasis Panel, NIH Antimicrobial Therapeutics and Resistance (ZRG1 AIDC Y 82)
- 2021: Macromolecular Structure and Function D (MSFD) study section
- 2022: Special Emphasis Panel, NIH Support for Research Excellence – First Independent Research (SuRE-First) Award
- 2022: NIH Macromolecular Structure and Function A Study Section
- 2023 -Present: Chartered Member (2023-2029) NIH Anti-Infective Resistance and Targets Study Section

d. National Science Foundation: HBCU-UP and Centers for Chemical Innovation (CCI) Programs

e. The Louisiana Board of Regents Research Competitiveness Subprogram

f. 2023-Present: Member, Scientific Advisory Committee (2023-2027), Institut Louis Malardé, French Polynesia

g. External Examiner, University of Madras, Chennai

• **Professional Society Membership**

- Member, American Chemical Society
- Member, Sigma Xi Honor Society
- Member, American Society of Pharmacognosy
- Member, Research Network Natural Products against Neglected Diseases.
- Member, National Organization for the Professional Advancement of Black Chemist and Chemical Engineers
- Member, Mississippi Academy of Sciences