

ANIEFIOK JOHN UDOAKANG, PhD.

Lecturer/Research Scientist

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PROFILE

Aniefiok is an enthusiastic, dynamic, confident and hardworking early-career researcher, who has strong interest in science and research. I am particular about advancing the frontiers of scientific knowledge through innovative research and mentoring, contributing to knowledge, breaking new grounds and actively driving to meet set goals and targets. I am a highly motivated individual whos objective is to impact my society through translation of basic research to the clinic and partnering with stakeholders to implement policies for better healthcare, especially in my country. I have acquired excellent coordinating and organizing skills, can analyse complex data and effectively communicate information and ideas in various formats to technical and non-technical audience. I enjoy working with a team and can work independently with minimum or no supervision.

RESEARCH AND TRAINING EXPERIENCES

❖ Postdoctoral Intern,

March 2020 – March 2021

West African Centre for Cell Biology of Infectious Pathogens,

University of Ghana

Legon, Accra, Ghana

- Evaluating the molecular mechanisms of breast cancer by identifying and characterising novel germline and somatic mutations, including epigenetic modifications, predisposing women of West African origin to breast cancer, metastasis and therapeutic resistance. This research is towards the identification of new therapeutic targets to improve breast cancer prognosis and predict response and/or toxicity.

Role Description:

- Molecular characterisation of breast cancer by identifying and validating biomarkers to develop a breast cancer diagnostic panel for treatment stratification.
- Investigating the functional role of DNA repair genes, including *POLE*, *POLD1* and microsatellites markers in breast oncogenesis, progression and metastasis.
- Determining the correlation between *POLE* and *POLD1* mutations, microsatellite instability, DNA methylation and breast cancer outcome in patients.

- Identifying the variability, differentiation, and process of breast cancer genetic evolution in the West African sub-region.

❖ **Noguchi Memorial Institute for Medical Research**

April 2020/ August 2021

COVID-19 response team Volunteer/COVID-19 Diagnostic Intern

Accra, Ghana

Role Description:

- Received and recorded samples of suspected cases and contact tracing.
- Collected nasopharyngeal and oropharyngeal swabs for COVID-19 testing.
- Sorted samples received, inputted, and collated data for proper record keeping in the chain.
- Processed samples for testing, including RNA extraction, from pooled and unpooled samples.
- Performed RT-PCR technique to detect SARS-CoV-2 in collected samples, and interpreted the results.

❖ **Trainee, Wellcome Genome Next Generation Sequencing Bioinformatics**

April - June 2021

Training Course, H3Africa Bioinformatics Network (Noguchi Classroom)

Accra, Ghana

Description:

- Used the unix command-line as a tool for data analysis.
- Described the different available NGS data file formats.
- Performed quality control (QC) assessment of high throughput sequence data.
- Explained the algorithm concepts behind read alignment, variant calling and structural variant detection.
- Performed read alignment, variant calling and structural variant detection using standard tools.
- Analysed RNA-Seq and CHIP-Seq data
- Performed genome assembly using NGS data.

❖ **2021 Africa Research Excellence Fund (AREF)**

March – April 2021

Trainee, Essential Grant Writing Skills Workshop (Virtual)

Accra, Ghana

Description:

- Understanding funders' requirements.
- Formulating a compelling research question.
- Why competitive-proposal writing matters.
- Writing letter of Intent/Concept Note/Preliminary proposal.
- Key part of project description.

- Planning proposal project plan and budget.
- Principles of managing collaborations and team.

❖ **Welcome Genome Campus workshop on Next Generation Sequencing (NGS) analysis for monogenic diseases in African Population** *Sept. 2018*

Trainee

Kigali, Rwanda

Description:

- Trained on NGS genomic study approaches and analysis pipelines for discovery and validation of rare monogenic disease-causing variants, with specific focus and considerations for African population.
- Acquired knowledge and exposure to key electronic resources that can be harnessed for assessing potential pathogenicity of variants.

❖ **Doctoral Fellow, Université Cheikh Anta Diop de Dakar***Mar 2016 – May 2019*

Dakar, Senegal

Role Description:

- Investigated the role of microsatellites in the genetic evolution of breast cancer in Nigerian and Senegalese women using population genetic tools. Results showed the potential role of microsatellite instability in breast cancer in Nigeria and Senegalese women.
- Examined and compared breast cancer reproductive parameters in breast cancer patients in Nigeria and Senegal.
- Evaluated the relationship between microsatellite instability-high tumours and breast cancer clinicopathological characteristics in our study cohort.

❖ **Trainee, 23rd Summer Institute in Statistical Genetics, Department of** *July 2018*

Biostatistics, School of Public Health, University of Washington.

Seattle, USA

Modules:

- Probability and Statistical Inference.
- Regression Methods: Concepts & Applications.
- Quantitative Genetics.
- Mixed Models in Quantitative Genetics.
- Advanced Quantitative Genetics.
- Statistical and Quantitative Genetics of Disease.

❖ **Trainee, Abu Dhabi Winter Institute in Statistical Genetics 2017, New York** Jan. 2017
University, Abu Dhabi, United Arab Emirates Abu Dhabi, UAE

Modules:

1. Population Genetics Data Analysis.
2. Pathway and Network Analysis for Omics Data.

❖ **Graduate Student, University of Ibadan** Feb 2013 – Feb 2015
Ibadan, Nigeria

Role Description:

- Evaluated the potential genotoxic effect of titanium dioxide nanoparticles on the somatic cells of male albino mice using the mouse bone marrow micronucleus assay.
- Results suggested that the bone marrow cells may be potential targets for titanium dioxide nanoparticles induced DNA damage and genotoxicity in mice.

❖ **Undergraduate researcher, University of Calabar, Calabar** Jan 2008 – Jun 2009

Description:

- Assessed the prevalence of hypertension in diabetic patients at the University of Calabar Teaching Hospital, Calabar.
- Results showed a high prevalence of hypertension in female diabetic patients than in men.

EDUCATION

❖ **Université Cheikh Anta Diop de Dakar** Mar 2016 – May 2019
PhD, Population Genetics Dakar, Sénégal
Dissertation: Characterisation and Genetic Evolution of Breast Cancer among Nigerian and Senegalese Women.

❖ **University of Ibadan, Ibadan** Feb 2013 – Feb 2015
M.Sc., Zoology (Cell Biology and Genetics) Ibadan, Nigeria
Thesis: Genotoxicity assessment of titanium dioxide nanoparticles (TiO₂NPs) using the mouse bone marrow micronucleus assay.

❖ **University of Calabar, Calabar** Apr 2004 – Jun 2009
B.Sc., Genetics and Biotechnology Calabar, Nigeria

Research topic: Prevalence of hypertension among diabetic patients at the University of Calabar Teaching Hospital, Calabar, Cross River State, Nigeria.

❖ **Federal Government Girls' College, Ikot Obio Itong** Jun 2002
National Examination Council Ikot Obio Itong, Nigeria

WORK EXPERIENCES

❖ **University of Medical Sciences** Aug. 2021 – Present

Centre for Molecular Biosciences and Medical Genomics.

Lecturer/Research Scientist Ondo State, Nigeria

Role Description:

- Teaching: Teaching genetics, developmental biology, biotechnology and physiology to faculty of science and medical students (1st to 4th year).
- Research: Investigating the impact of COVID-19 on breast cancer management in Nigeria: Implications for cancer care in a low-resource setting like Nigeria.
- Mentoring students in research and career goals.
- Investigating the genetics and epigenetic mechanisms modulating breast cancer in Nigeria and women of West African descent.

❖ **Project Coordinator** April 2021 – Aug. 2021

In “Tracking COVID-19 infection in West Africa to guide public health interventions” project

West African Centre for Cell Biology of Infectious Pathogens,
University of Ghana

Legon, Accra, Ghana

Role Description

- Conducting large scale population screening for previous and current SARS-CoV-2 infections using rapid tests (antibody and antigen).
- Using community engagement to screen for COVID-19 exposure and infection, educate and obtain samples for sequencing.
- Sequencing the genomes of SARS-CoV-2 virions isolated from COVID-19 patients across Ghana, Nigeria and Burkina Faso, to study viral evolution and identify variants associated with increased infectivity and pathogenicity.
- Validation of COVID-19 Antibody Rapid diagnostic kits, sample processing and seroprevalence surveillance in Ghana.

❖ **National Youth Service Corps - Millennium Development Goals** Nov 2009 – Dec 2014
Advocacy Project (NYSCMAP) Trainer and Development Knowledge
Facilitator Anambra State, Nigeria

Role Description:

- Sensitised up to 10,000 National Youth Service Corps (NYSC) members on the Millennium Development Goals Advocacy project to become agents of change and achieve the MDGs (Sustainable Development Goals).
- Facilitated the training and graduation of more than 500 graduates (NYSC volunteers) on the MDGs and practical ways of achieving the Sustainable Development Goals (SDGs).

❖ **Seventh-Day Adventist Nursery/Primary School** Sep 2011 – Feb 2013
Grade Two and Grade Five Class Teacher Calabar, Nigeria

Role Description:

- Organised and delivered lessons on a range of subjects to students
- Evaluated students for understanding of the different subjects.

❖ **Living Stones Academy** Jan 2011 – Aug 2011
Sep 2008 – Oct 2009
Grade Three and Grade Four Class Teacher/ School Supervisor Calabar, Nigeria

Role Description:

- Organised and delivered lessons on a range of subjects to students
- Evaluated students for understanding of the various subjects.
- Supervised teachers at the school and evaluated their lesson notes

❖ **National Youth Service Corps member (NYSC)** Nov 2009 – Nov 2010
Igwebuike Grammar School, Awka South Anambra State, Nigeria
Biology Teacher, Senior Secondary Class

Role Description:

- Taught biology to High School Students (Grade 11)
- Encouraged participation by giving prompts direction and challenged students
- Showed creativity through the use of supplementary materials to support learning.

SCHOLARSHIPS AND AWARDS

- ❖ **Travel grant for the 12th meeting of the African Society of Human Genetics** Sep 2019
African Society of Human Genetics Bamako, Mali.
 - ❖ **PhD fellow, ECOWAS Nnamdi Azikiwe Academic Mobility Scheme (ENAAMS)** Mar 2016 – May 2019
Economic Community of West African States (ECOWAS) Dakar, Senegal
 - ❖ **Scholarship for Six Modules of the 23rd Summer Institute in Statistical Genetics** July 2018
23rd Summer Institute in Statistical Genetics, Department of Biostatistics, School of Public Health, University of Washington. Seattle, USA
 - ❖ **Travel grant for the Environmental Health in Africa: Opportunities to Expand Research Capacity in the H3Africa Consortium workshop** Sep 2018
National Institute of Environmental Health Sciences Kigali, Rwanda
 - ❖ **Training Scholarship for the NGS analysis for Monogenic diseases in the African Population** Sep 2018
Wellcome Genome Campus Kigali, Rwanda
 - ❖ **Scholarship award covering travel, accommodation, two modules fees and feeding for the Winter Institute in Statistical Genetics** Jan 2017
New York University Abu Dhabi Abu Dhabi, UAE
 - ❖ **Scholarship award covering travel, accommodation, two modules fees and feeding for the Winter Institute in Statistical Genetics** Jan 2017
University of Ghana Pan-African Doctoral Academy (PADA) Accra, Ghana
 - ❖ **Best Poster Presentation** Mar 2015
Faculty of Science 2nd International Conference on “Scientific research and innovation in Nigeria” Ibadan, Nigeria
 - ❖ **Best Millennium Development Goals Advocacy Project Corps Volunteer South-South of Nigeria** Jan 2011
..... Awka South, Nigeria
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CONFERENCES ATTENDED AND PRESENTATIONS

- ❖ **Aniefiok John Udoakang**, Fatimata Mbaye, Adeyinka Ademola, Sep 2019
Ganiyu O. Arinola, Temidayo O. Ogundiran, and Mbacke Sembene. Bamako, Mali
Clinicopathological Characteristics of NR-21 and NR-24 among breast
cancer patients in Nigeria and Senegal.
Oral presentation delivered at the Young Investigators Forum of the
12th Conference of the African Society of Human Genetics.
- ❖ **Aniefiok John Udoakang**, Fatimata Mbaye and Mbacké Sembene. Mar 2019
Microsatellite Instability of *BAT-26* and *NR-24* among Breast Cancer Patients in Senegal. Dakar, Senegal
Oral presentation delivered at the Joint meeting of the Senegalese Society for Human Genetics and the
African Society of Histology-Embryology and Cytogenetics.
- ❖ **Aniefiok J. UDOAKANG**, Fatimata Mbaye, Adeyinka Ademola, Nov 2018
Ganiyu O. Arinola, Temidayo O. Ogundiran, Mbacke Sembene. Cape Town, South Africa
Microsatellite Instability: *NR21*, *NR24* in Nigeria and Senegal.
Flash talk and Poster presentation delivered at the 4th Global Genomic and Medicine Collaboration
(G2MC) conference.
- ❖ **Aniefiok J. UDOAKANG**, Fatimata Mbaye, Bineta Keneme, Sep 2018
Adeyinka Ademola, Ganiyu O. Arinola, Mbacke Sembene, Kigali, Rwanda
Temidayo O. Ogundiran. Survey of breast cancer patients in Nigeria and Senegal.
Poster presentation delivered at the National Institute of Environmental Health Sciences
Environmental Health in Africa: Opportunities to Expand Research Capacity in the H3Africa
Consortium workshop,
- ❖ **8th Conference of the African Society of Human Genetics**..... May 2016
Participant at the conference themed ‘Strengthening Human Genetics Research in Africa’
Dakar, Senegal
- ❖ **Udoakang, A. J.**, Anifowoshe, A. T., Fadoju, O. M., Ogunsuyi, O. I., Mar 2015
Oyeyemi, I. T., Alabi, O. A., Alimba, G. C. and Bakare, A. A. Ibadan, Nigeria
Genotoxicity of titanium dioxide nanoparticles using the mouse sperm morphology and bone-marrow
micronucleus assays.

Poster presentation delivered at the Faculty of Science 2nd International Conference on “Scientific research and innovation in Nigeria.”

PUBLICATIONS

- ❖ **Aniefiok John Udoakang**, Alexandra Lindsey Djomkam Zune, Kesego Tapela, Oloche Owoicho, Ifeoluwa Kayode Fagbohun, Claudia Adzo Anyigba, Mat Lowe, Nora Nghochuzie Nganyewo, Bineta Keneme, Frances Ngozi Olisaka, Agatha Nkem Henry-Ajala, Mary Aigbiremo Oboh, Lily Paemka and Lucas N Amenga-Etego. 2022. Knowledge, attitude and perception of West Africans towards COVID-19: a survey to inform public health intervention. *BMC Public Health*. <https://doi.org/10.1186/s12889-022-12814-9>.
Role: Conceptualisation and writing of the manuscript
- ❖ Quashie, PK, Mutungi, JK, Dzabeng, F, Oduro-Mensah, D, Oporum, PC, Tapela, K, **Udoakang, AJ**, *et al.*, Trends of Severe Acute Respiratory Syndrome (SARS-CoV-2) antibody prevalence in selected regions across Ghana. [version 1; peer review: awaiting peer review]. *Wellcome Open Res* 2021, **6**:173 (<https://doi.org/10.12688/wellcomeopenres.16890.1>).
Role: Data Collection and writing of the manuscript
- ❖ Nghochuzie, N. N., Olwal, C. O., **Udoakang, A. J.**, Amenga-Etego, L. N., & Amambua-Ngwa, A. 2020. Pausing the Fight Against Malaria to Combat the COVID-19 Pandemic in Africa: Is the Future of Malaria Bleak?. *Frontiers in microbiology*, *11*, 1476. <https://doi.org/10.3389/fmicb.2020.01476>.
Role: Writing – Critically reviewed the manuscript.
- ❖ Bakare, A. A., **Udoakang, A. J.**, Anifowoshe, A. T., Fadoju, O. M., Ogunsuyi, O. I., Alabi, O. A., Alimba, C. G., and Oyeyemi, I.T. 2016. Genotoxicity of Titanium Dioxide Nanoparticles using the Mouse Bone Marrow Micronucleus and Sperm Morphology Assays. *Journal of Pollution Effects & Control*. ISSN: 2375-4397.
Role: Research, Data Analysis and initial manuscript draft.
- ❖ **Aniefiok John Udoakang**, Fatimata Mbaye, and Mbacke Sembene. 2019. Microsatellite Instability of *BAT-26* and *NR-24* among Breast Cancer Patients in Senegal. *IOSR Journal of Dental and Medical Sciences*. 18(1): 71-78.
Role: Research, Analysis and manuscript writing

- ❖ Udoakang A, Oboh M, Henry-Ajala A *et al.* Low COVID-19 impact in Africa: The multifactorial Nexus [version 1; peer review: 1 approved]. **Open Research Africa** 2021, 4:47 (<https://doi.org/10.12688/aasopenres.13261.1>).

Role: Conceptualisation and writing of manuscript

In Review

- ❖ **Aniefiok John Udoakang**, Nora Nghochuzie Nganyewo, Alexandra Lindsey Djomkam Zune, Charles Ochieng' Olwal, Nsikak-Abasi Aniefiok Etim, Mary Aigbiremo Oboh, Kesego Tapela, Francis Dzabeng, Samuel Mawuli Adadey, Agnes Udoh, Mazo Koné, Joe Kimanthi Mutungi, Peter Kojo Quashie, Gordon Akanzuwine Awandare, Lily Paemka. Knowledge, attitude and perception towards the coronavirus disease 2019 (COVID-19) in sub-Saharan Africa: A cross-sectional study during the pandemic's exponential phase. *PLOS ONE*

Role: Conceptualization and manuscript writing

- ❖ Claudia Adzo Anyigba, **Aniefiok John Udoakang**, Samuel Sunlanoun Anakpeba-Dinguyella, Belinda Selase Korkor, Jimmy Aidoo, Lily Paemka. Breast Cancer amidst the COVID-19 Pandemic in Sub-Saharan Africa. *Cancer Epidemiology*

Role: Writing – Initial manuscript draft

- ❖ **Aniefiok J. UDOAKANG**, Fatimata Mbaye, Bineta Keneme, Adeyinka Ademola, Ganiyu O. Arinola, Mbacke Sembene, Temidayo O. Ogundiran. Survey of breast cancer patients in Nigeria and Senegal. *Pan African Medical Journal*.

Role: Research, Analysis and manuscript writing

Manuscripts under preparation

- ❖ **Aniefiok John Udoakang**, Alexandra Lindsey Djomkam Zune, Kesego Tapela, Nora Nghochuzie Nganyewo, Frances Ngozi Olisaka, Claudia Adzo Anyigba, Sylvia Tawiah-Eshun, Lily Paemka, Peter Kojo Quashie. A Tripod Landscape: COVID-19, Tuberculosis, and HIV/AIDS
- ❖ **Aniefiok John Udoakang**, Fatimata Mbaye, Adeyinka Ademola, Ganiyu O. Arinola, Temidayo O. Ogundiran, Mbacke Sembene. Diversity and Genetic Evolution of Breast Cancer among Nigerian and Senegalese women.

- ❖ Mame Diarra Samb, **Aniefiok John Udoakang**, Fatimata Mbaye, Mbacke Sembene. Study of phenotypic and morphometric characteristics of the Senegalese population: Cheek dimple, Cleft-chin, tongue rolling, tongue folding, widow's peak and earlobe.

PROFESSIONAL SOCIETIES AND SERVICES

- ❖ **African Society of Human Genetics**May 2016 – Present
Member
- ❖ **The European Association of Cancer Research**Sep 2020 – Present
Early Career Member
- ❖ **Genetics of Common and Rare Diseases** Nov 2020 – Present
Frontiers in Pediatrics and Frontiers in Genetics
Review Editor

INTERNSHIP

- ❖ **Laboratory Unit, General Hospital Calabar**Oct 2006 – Jan 2007
Industrial Training
Nov 2007 – Jan 2008
- Performed various laboratory tests and gave patients results, including antiretroviral, Pack Cell Volume (PCV), Malaria, Blood group, etc.

VOLUNTEER

- ❖ **West African Centre for Cell Biology of Infectious Pathogens**Apr 2020 – March 2021
- **COVID-19 Response and Surveillance Team**
Role Description
 - Validation of COVID-19 Antibody Rapid diagnostic kits.
 - COVID-19 sample processing using molecular biology tools.
 - COVID-19 Seroprevalence surveillance in Ghana

❖ **Development Knowledge Volunteer/Facilitator** Nov 2009 – Oct 2010

Role Description

- As an advocacy volunteer, I conceptualised and carried out sensitisation and advocacy campaigns on women and youth empowerment and the effects of early sexual activities.
 - Organised an inter-secondary school debate competition with giving of prizes
 - Electoral Secretary, Igwebuiké Grammar School, Awka South, Anambra State, Nigeria.
 - Public Relations Officer, MDGs Community Development Service Group, Awka South, Anambra State, Nigeria.
 - Treasurer, Publicity Community Development Service, Awka South, Anambra State, Nigeria
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REFEREES

❖ **Prof. Adekunle Bakare.**

Dean, Faculty of Science, University of Ibadan, Ibadan, Nigeria.

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Website: <http://www.sci.ui.edu.ng/AABakare>

Phone Number: +234 (0) 80 2738 9324; +234 (0) 70 3229 5419

❖ **Dr. Chiaka Anumudu.**

Cellular Parasitology Programme, Department of Zoology, University of Ibadan, Ibadan, Nigeria.

Email: cianumudu@yahoo.com

Phone Number: +234 8023590478

❖ **Dr. Lily Paemka.**

Department of Biochemistry, Cell & Molecular Biology, West African Center for Cell Biology of Infectious Pathogens, School of Biological Sciences, College of Basic and Applied Science, University of Ghana, P. O. Box LG 54, Legon, Accra, Ghana.

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