

**NANFACK MINKEU Ferdinand**

Molecular Virologist and Entomologist

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## Professional experience

**Since -August 2022: Visiting Assistant Professor at The College of Wooster, Wooster, USA.**

- Literature searches and experimental designs
- Mosquito surveillance and population genetics (DNA isolation, PCR and sequencing, Bio-informatic analyses)
- Mosquito-borne viruses and evolution (RNA isolation, RT-PCR, RACE, qPCR, sequencing, bio-informatic analyses)
- Mentoring of undergraduate student research
- Teaching in introductory molecular biology and genomics sections

**May2020-August 2022: Adjunct Professor, Post doctoral researcher and Research technician at The College of Wooster, Wooster, USA.**

- Literature searches and experimental designs
- High Performance Liquid Chromatography/mass spectrometry and analysis of proteins
- Mosquito-borne arboviruses and reproduction studies (Microscopy techniques and PCR)
- Molecular and genomic characterization of seminal fluid proteins (RNAseq, RT-qPCR, and Bioinformatics)
- Virus discovery and arbovirus screening (Bioinformatics and RT-PCR)
- Mentoring of undergraduate student research
- Teaching in introductory molecular biology laboratory sections
- Cell culture overview and discussion

**Since-August 2019: Consultant at International Institute for Tropical Agriculture (IITA), Cotonou, Benin.**

- Mosquito-borne diseases and arboviruses testing
- Insecticide resistance and viral infections in mosquitoes
- Mentoring of graduate students

**July 2019-Feb 2020: Postdoctoral researcher at the Kansas State University, Manhattan, KS, USA.**

- Molecular characterization of viruses: DNA/RNA purification, qPCR, PCR, sequencing, RNAseq, cloning.
- Interaction endosymbionts and viruses: qPCR and statistical analysis
- Bio-informatic analyses and RNAseq: Trimming (Trimmomatic), Mapping (Bowtie2, STAR, HISAT2), Differential expression (HTseq and DESeq2).

**April 2015-June 2019 / Scientist at the Institut Pasteur in Paris, France**

- Used molecular tools to characterize insect-specific viruses and arboviruses of malaria vectors
- Designed primer for RNA interference, classical PCR and real time PCR (Taqman and SYBR Green)
- Carried out and analyzed sequencing RNA experiment
- I deciphered the evolution between insect specific viruses and arboviruses
- Cell culture and virus quantification

**May-December, 2013 / Assistant Engineer at the University of Strasbourg, France**

- Produced transgenic and mutant malaria vectors by using a new tool called the CRISPR/Cas9 mutagenesis through molecular Biology (Cloning, PCR), Immunology and genetic techniques (micro-injection, crossing species)

**April 2010-November, 2012 / Medical entomologist of Ministry of public health-Cameroon in the project entitled “Impact of insecticide resistance on the efficacy of LLINs in the North of Cameroon ”**

- Mosquito larva collection, ELISA, dissection and evaluation of parity rate, infection rate of malaria parasites, evaluation of insecticidal and larvicidal effects of plants extracts. Establishment of SOPs. Wrote technical reports.

## Education

**2015-2018: PhD in Life Science Complexity, Sorbonne University, Paris, France.**

- PhD thesis on Anopheles viruses (RT-qPCR, RNAseq, de novo assembly of viruses, virus discovery and Evolution).

**2008-2011: Master’s degree in Biochemistry - Biotechnology and Development / Medical entomology, University of Yaoundé I, Cameroon.**

- Master’s thesis on malaria transmission: Mosquito collection, Bioassays, *Anopheles* identification, Parity, Infection rate (ELISA) of malaria parasites and *Anopheles* competence analysis.

**2005-2008: Bachelor’s degree in Biochemistry, University of Yaoundé I.**

- Electrophoresis, Chromatography, Biomolecule properties and structures, Nutrition

## Teaching activities

### **Since -August 2022: Visiting Assistant Professor at The College of Wooster, Wooster, USA**

- Fall 2022: Taught an introductory course: Foundations of Biology (BIOL 111)
- Fall 2022: Taught Genes and Genomes (BIOL 306), upper-level class.
- Fall 2022: Taught Genes and Genomes Laboratory (BIOL 306)
- Fall 2022 & Spring 2023: Mentored two senior thesis students (BIOL 451 & BIOL 452)
- Spring 2023: Taught Gateway to Molecular and Cellular Biology Laboratory (BIOL 201)
- Spring 2023: Taught Genes and Genomes (BIOL 306), upper-level class.
- Spring 2023: Taught Genes and Genomes Laboratory (BIOL 306)

### **2020-2022/Adjunct at the Biology department of the College of Wooster, Ohio**

- Fall 2021: Mentored two senior thesis students (BCMB 401)
- Spring 2021: Taught Gateway to Molecular and Cellular Biology Laboratory (BIOL 201)
- Fall 2020: Mentored two senior thesis students (BIOL 451 & BCMB-451)

### **2020-2021/Assistant and tutor at the French department, College of Wooster, Ohio**

- Spring and Fall 2021: Tutor of students
- Fall 2020 : Assistant during French Conversation FA20

### **2015-2016/Volunteer in language space: *Cité internationale universitaire* of Paris, France.**

- Taught French to non-native speakers and students by using conversation groups.

### **2010-2012/Assistant and tutor in the Biochemistry department/University of Yaoundé I, Cameroun**

- I taught graduate and undergraduate students biochemistry techniques: electrophoresis, chromatography, yogurt and jam fabrication.
- I was involved in the copy checking process
- I did practical works and directed works to under-graduated students
- Tutor in purification and separation techniques of biomolecules for graduated students

### **2009- 2012 /Responsible of health and Environment for AJAH 3000, Cameroon. Part time.**

- Organized meetings, seminar and training. Planned and researched lucrative projects. Elaborate and manage strategies for environment protection.
- Taught infectious, rare and metabolic diseases to local populations
- Organized workshops on the fabrication of hypochlorite sodium and food preservation.

## Languages

- Mother tongue **French**
- Other languages: **Italian (B1)** Written/Oral Proficiency Threshold Beginner

## Publications

- **Nanfack-Minkeu F**, DeLong A, Moses Luri M and Poelstra JW. (2023). Invasive *Aedes japonicus* mosquitoes dominate the *Aedes* fauna collected with gravid traps in Wooster, northeastern Ohio, USA. *Insects*, 14(1).
- Ateutchia Ngouanet S, Wanji S, Yadouleton A, Demanou M, Djouaka R and **Nanfack-Minkeu F**. 2022. Factors enhancing the transmission of mosquito-borne arboviruses in Africa. *Virusdisease.*, 1-12. doi: 10.1007/s13337-022-00795-7.
- Parsana D, **Nanfack-Minkeu F** and Sirot LK. 2022. Insemination status in *Aedes aegypti* and *Aedes albopictus*. *Cold Spring Harb Protoc.* doi: 10.1101/pdb.top107668
- Parsana D, **Nanfack-Minkeu F** and Sirot LK. 2022. Determining the Insemination Status of *Aedes* Mosquitoes. *Cold Spring Harb Protoc.* doi: 10.1101/pdb.prot107954.
- **Nanfack-Minkeu F** and Sirot LK. 2022. Effects of Mating on Gene Expression in Female Insects: Unifying the Field . *Insects* **2022**, 13(1), 69.
- Mbomen-Mbomen LM, **Nanfack-Minkeu F**, et al. 2020. Validation d'une méthode de valorisation matière et énergie des huiles de vidange. *Déchets Sciences et Techniques*, 83. <https://doi.org/10.4267>
- Belda E, **Nanfack-Minkeu F**, et al. 2019. De novo profiling of RNA viruses in *Anopheles* malaria vector mosquitoes from forest ecological zones in Senegal and Cambodia. *BMC genomics*, 20:664.
- **Nanfack-Minkeu F**, et al. 2019. Interaction of members of the natural RNA virome with the African malaria vector, *Anopheles coluzzii*. *Scientific reports* 9 : 6319.
- **Nanfack Minkeu F** and Vernick K. 2018. A systematic review of the natural virome of *Anopheles* mosquitoes. *Viruses* 10(5), 222.
- **Nanfack FM**, Dongmo ZY, Fogang A. 2015. Les insectes impliqués dans les pertes post-récolte des céréales au Cameroun : méthodes actuelles de lutte et perspectives offertes par la transgénèse. *Int. J. Biol. Chem. Sci.*, 9(3) :1630-1643.
- Bigoga D Jude, **Nanfack M Ferdinand, et al.** 2012. Seasonal prevalence of malaria vectors and entomological inoculation rates in the rubber cultivated area of Niete, South Region of Cameroon. *Parasites & Vectors*, 5:197.

## Other scientific communications

- Domenick Barbo, Richard Yanagihara, Elysée Nchoutpouen, **Nanfack-Minkeu**

**Ferdinand**, Esemu Livo. (2014). TRMD/MHIRT Abstract: Arbovirus Surveillance in *Aedes aegypti* and *Aedes albopictus* Mosquitoes in Central Cameroon.

- **Nanfack-Minkeu Ferdinand**. (2013). Mutant and transgenic anopheles: the missing tools for Malaria vector control. PAMCA essay membership.

## Books

**Nanfack-Minkeu Ferdinand**. (2021). Moustiques et maladies au Cameroun : Les défis de la biologie dans la lutte antivectorielle. *Harmattan*, ISBN : 978-2-343-24111-1, EAN13 : 9782343241111, EAN PDF : 9782140194924, 222p.

## Awards and funding

- 4000 dollars from The College of Wooster (Ohio, USA) in 2022 to study the density and diversity of mosquitoes in Wooster and predict potential mosquito-borne disease outbreaks.
- INFRAVEC 2 : 2020, arbovirus screening and gene expression of mosquitoes
- Essay on vector control-student membership 2014, PAMCA, Kenya

## Conferences and oral presentation

- Arthropod Genomics Symposium 2022, June 9-11, 2022, University of Notre dame, Indiana, USA.
- Entomophagy in Cameroon, December 2021, Department of Biology, The College of Wooster, Ohio, USA.
- American society for virology (ASV), 38<sup>th</sup> Annual Meeting, July 24-28, 2019, Minnesota, USA 2019.
- American Society of Tropical Medicine & Hygiene (ASTMH) 66th Annual Meeting November 5-9, 2017, Baltimore, USA
- EMBO Conference- Vector and disease control, 24 – 28 July 2017 in Chania, Greece
- Cameroon Bioscience Society (CBS) 18th December 2011, University of Douala, Cameroon.

## Major Mentoring Activities:

Sandra Ateucthia Ngouanet. 2020-2024: Contribution of wet agriculture in the insecticide resistance status of *Aedes* vectors and arbovirus transmission in Benin, West Africa. PhD thesis. *In preparation* at the University of Buea, Cameroon and International Institute of Tropical

Agriculture (IITA), Cotonou, Benin.

Cristian Amesbury: 2022-2023. Interactions between viruses and Wolbachia. Presented in Partial Fulfillment of the Requirements of Senior Independent Study (Bachelor), at The College of Wooster, Ohio, USA.

Adams Tomoka: 2022-2023. Molecular ecology and population genetics of *Aedes japonicus*. Presented in Partial Fulfillment of the Requirements of Senior Independent Study (Bachelor), at The College of Wooster, Ohio, USA.

Alex Delong: 2021-2022. The virome of *Aedes japonicus* and *Culex* spp., collected in Wooster, Ohio, USA. Presented in Partial Fulfillment of the Requirements of Senior Independent Study (Bachelor), at The College of Wooster, Ohio, USA.

Rachel Greer: 2020-2021. Communicating science to college students: a comparison of infographic and text based approaches. Presented in Partial Fulfillment of the Requirements of Senior Independent Study (Bachelor). College of Wooster, Ohio, USA. Co-advisor with Dr Sirot.

Dhwani Parsana: 2020-2021. Effect of Adipokinetic Hormone on Mating Receptivity of *Aedes aegypti* Females. Presented in Partial Fulfillment of the Requirements of Senior Independent Study (Bachelor). College of Wooster, Ohio, USA. Co-advisor with Dr Sirot.

Lee, Beenhwa Grace: 2020-2021. The Effect of Adipokinetic Hormone on the Blood and Sugar Feeding Behavior and Life Span of Female Mosquito *Aedes aegypti*. Presented in Partial Fulfillment of the Requirements of Senior Independent Study (Bachelor). College of Wooster, Ohio, USA. Co-advisor with Dr Sirot.

## Memberships

**Since 2023/** Member of the Society for the Study of Evolution (SSE), USA.

**Since 2021/** Member of the RNA society, USA

**Since 2021/** Member of the RNA society, USA.

**Since 2019/** Member of the American Society for Virology, USA.

**2017-2023/** Member of the American Society of Tropical Medicine and Hygiene, USA.

**2021-2022/**Member of the Ohio mosquito and vector control association, USA

**2014-2014/**Student member of the Pan Africa Mosquito Control Association (PAMCA), Kenya.

## Editorial board and review

**Since 2022/** Reviewer for Scientific reports

**Since 2021/** Member of the editorial board at Frontiers in Tropical diseases.

**Since 2021/** Reviewer for Insects

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**Since 2021/** Reviewer for International Journal of Environmental Research and Public Health

**2020/2022** : Guest editors for insects : Special issue “Applied Insect Reproductive Biology”