Oladipupo Ridwan Bello

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SUMMARY

Computational immunologist with extensive experience applying bioinformatics and machine learning to decode immune system complexity, with the goal of accelerating the development of immunotherapies and diagnostic/prognostic biomarkers for human and animal health.

EDUCATION

PhD in Animal Sciences (Genetics and Genomics), University of Maryland, College Park, USA, 2025
Dissertation: Exploring the Drivers of Public T-Cell Receptors Using Deep Learning and Single-Cell Transcriptomics

MSc in Animal Breeding & Genetics (Distinction), University of Ibadan, Nigeria, 2019

BSc in Animal Science (First Class Honors), University of Ibadan, Nigeria, 2015

RELEVANT SKILLS

- **Bioinformatics:** TCR/BCR repertoire analysis, MiXCR, TRUST4, Bulk/single-cell RNA-Seq, WGS, ChIP-Seq, ATAC-Seq, structural modeling.
- **Statistical Analysis:** Hypothesis testing, linear and generalized linear models, mixed models, survival analysis, multivariate statistics, time series analysis, Bayesian statistics.
- **Programming:** R, Python, Bash, SQL, C, Rust.
- **Machine Learning:** Neural networks, random forest, transformers, generative models, classification, regression, clustering.
- **Laboratory Techniques:** Tissue Dissection, Microscopy, DNA Extraction, PCR, Gel Electrophoresis, Molecular Cloning.
- **Environments and Tools:** Git, Docker, Singularity, HPC/Slurm, Quarto, Linux, macOS, Windows.

RESEARCH EXPERIENCE

Doctoral Research Assistant (January 2021 – August 2025)
Department of Animal and Avian Sciences, University of Maryland, College Park, USA

- **Evaluated the role of public (shared) T cell receptors in human and bovine immunity**
  - Designed and trained a high-performance convolutional neural network classifier (over 85% precision and recall) to distinguish highly variable public and private T cell receptor nucleotide sequences.
  - Modeled 3-dimensional T-cell receptor structures in MHC contexts to investigate the structural implications of TCR publicness.
  - Isolated T cell receptor sequences from single-cell RNA-Seq data and examined the transcriptome profile of public and private T cells.
  - Studied intercellular communication patterns of public and private T cells with other immune cells.
  - Functionally characterized T cells with public and private receptor sequences to identify candidate genes that are associated with T cell receptor publicness.
- **Evaluated the genetic and epigenetic mechanisms of Marek's disease resistance in chickens**
  - Examined the gene expression profile of Marek's disease-resistant and susceptible chicken lines with bulk RNA-Seq to identify candidate genes that are associated with Marek's disease resistance.
  - Used ChIP-Seq and ATAC-Seq to corroborate and resolve candidate genes identified by RNA-Seq.
  - Leveraged the highly inbred nature of the chicken lines to identify RNA editing events and associated genes implicated in Marek's disease resistance.
  - Examined the biological implications of co-expressed candidate genes.
- Served as Laboratory Compliance Officer, ensuring the lab met university safety and regulatory standards.

Intern—Cocoa Research Institute of Nigeria, Ibadan, Nigeria (February – November 2014)

- Served in the entomology unit as a research assistant on the use of neem extract (*Azadirachta indica*) as an organic pesticide for *Theobroma cacao*.
- Served in the pathology unit as a research assistant on the potency of different candidate fungicides on black pod disease of *Theobroma cacao*.

TEACHING EXPERIENCE

Graduate Teaching Assistant (January 2021 – August 2025)
Department of Animal and Avian Sciences, University of Maryland, College Park, USA

- **ANSC 103 (Principles of Animal Science Laboratory) and ANSC 101 (Principles of Animal Science)**, Fall 2023 – Spring 2025
  - Demonstrated animal handling and health care to students on the farm and in the lab.
  - Led guided research article reading and critique sessions.
  - Supervised field trips to animal shelters and commercial arm of the university farm.
  - Introduced students to experimental design and statistical analyses used in animal research.
  - Proctored and graded laboratory reports, tests, and exams.
- **ANSC 627/327 (Quantitative and Molecular Genetics)**, Spring 2023
  - Held weekly TA office hours to assist undergraduate and graduate students with the course materials covering basic to advanced topics in quantitative and molecular genetics.
  - Led course review sessions and graded exams.
- **ANSC 447 (Physiology of Mammalian Reproduction Laboratory)**, Fall 2021
  - Demonstrated gross anatomy and histology of livestock reproductive system to students in the lab.
  - Laboratory techniques encompassed dissection and microscopy.
  - Proctored and graded tests and laboratory reports.

Tutorial Assistant (March 2017 – September 2018)
Department of Animal Science, University of Ibadan, Nigeria

- Coordinated and led tutorials for undergraduate students on:
  - Molecular and quantitative genetics
  - Introductory statistics, including probability, probability distributions, and design of experiments

PUBLICATIONS (Google Scholar)

Bello, O.R., Arvind J. & Johnson, P.L.F. (In preparation). Intrinsic Determinants of TCR Publicness and Their Structural Implications. *PLOS Computational Biology*.

Bello, O.R., Ma L., Johnson, P.L.F. (In preparation). Distinct Cytotoxic Effector Phenotypes of Public T Cells. *Frontiers in Immunology*.

Bello, O.R., Salako, A.E., Akinade, A.S., & Yakub, M. (2023). Relationship between Milk Yield and Udder Morphology Traits in White Fulani Cows. *Dairy*, 4, 435-444. https://doi.org/10.3390/dairy4030029

Ewuola, E.O., Adeyemi, A.A., & **Bello, O.R.** (2020). Variations in haematological and serum biochemical indices among White Fulani bulls, Ouda rams and West African Dwarf bucks. *Nigerian Journal of Animal Production*, 44(1), 136-143. https://doi.org/10.51791/njap.v44i1.561

SELECTED CONFERENCE PRESENTATIONS

Bello, O.R., & Johnson, P.L.F. (January 10-15, 2025). *Public T Cell Receptors in Bovine Immunity*. International Plant & Animal Genome Conference, San Diego, California, USA. https://plan.core-apps.com/pag32/abstract/11d52799fbee2e951df7857ea4878432

Bello, O.R., Chu, Q., & Song, J. (July 10-13, 2023). *Temporal profiling of the bursa transcriptome reveals systemic differences induced by Marek's disease virus*. Poultry Science Meeting, Philadelphia, Pennsylvania, USA. https://www.poultryscience.org/viewdocument/2023-psa-annual-meeting-abstract-bo

SELECTED HONORS AND AWARDS

- Invited Peer Reviewer (2025): Elsevier
- Jacob K. Goldhaber Travel Grant (2025): Graduate School, University of Maryland, College Park, USA
- Animal Health & Care Academy Fellowship (2024/2025): MANRRS, USA (sponsored by Merck & Zoetis)
- Shaffner Award for Second Place in Poultry Research (2022): 35th Annual Symposium, Department of Animal and Avian Sciences, University of Maryland, College Park, USA
- Dean's Fellowship (2021): Graduate School, University of Maryland, College Park, USA
- EducationUSA Opportunity Funds Program Fellowship (2019): United States Embassy in Nigeria
- University of Ibadan Master's Scholarship & Tutorial Assistantship (2017): University of Ibadan, Nigeria
- Overall Best Candidate (Nationwide), Graduate Animal Scientist Exam (2016): Nigerian Institute of Animal Science