

Muhammad G. Khodary Omar, DVM, MSc, PhD
Postdoctoral Research Fellow | Dept. of Nutritional Sciences | Auburn University
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Professional Summary:

Veterinarian and translational cancer researcher with expertise in cancer immunology, molecular biology, engineered cell therapies, and tumor microenvironment modeling. Experienced in CAR-T cell engineering, phage display technologies, multi-omics, and advanced in vitro and in vivo cancer models. Current postdoctoral research at Auburn University focuses on obesity-associated colorectal cancer progression, metabolic dysfunction, and tumor-microenvironment interactions using physiologically relevant 3D cancer models. Dedicated to advancing translational oncology approaches bridging metabolism, immunology, and cancer therapeutics.

Education

- **PhD, Integrative Biomedical Sciences**
Tuskegee University, AL, USA | Jan 2020 -July 2025
 - **M.Sc., Virology & Immunogenetics**
Cairo University, Egypt | March 2015 - April 2018 | GPA: 3.7
 - **DVM, Veterinary Medicine**
University of Sadat City, Egypt | Sept 2006 - May 2011 | GPA: 3.6 | Top 10 of class
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Technical Skills

Molecular & Cellular Biology: PCR, cloning, Western blot, ELISA, proteomics workflows, transcriptomics.

Cell Engineering: CAR-T design, lentiviral vector construction, transduction, immune-cell assays.

Immunology Techniques: Multicolor flow cytometry, FACS sorting, cytokine assays, cytotoxicity assays.

Animal Models: metabolic assessments, surgical procedures, tumor implantation, Tissue collection and sampling.

Computational & Multi-omics: Spatial transcriptomics, scRNA-seq, basic bioinformatics and data integration.

Cell Culture & 3D Models: Primary cells, cancer cell lines, co-culture systems, spheroids and Patient derived models.

Research & Laboratory Management

- Experimental design, troubleshooting, and cross-disciplinary project coordination
 - Data management, manuscript writing, and scientific communication
 - Lab safety, compliance, and mentorship of undergraduate and graduate trainees
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Research Experience

Postdoctoral Researcher, Auburn University | March 2026 – Present

Department of Nutritional Sciences, Auburn University, USA

- *Supporting translational studies aimed at understanding how obesity-driven tumor microenvironments influence colorectal cancer progression and therapeutic response.*
- *Developing and utilizing advanced 3D cancer models, including spheroids and patient-derived systems, to study tumor–microenvironment interactions and therapeutic response.*
- *Working with obesity-associated conditioned media and co-culture platforms to evaluate cancer cell migration, invasion, and immune modulation.*
- *Performing murine handling, metabolic phenotyping, tissue processing, and translational in vitro/in vivo cancer studies.*
- *Collaborating on interdisciplinary projects integrating cancer biology, nutrition, metabolism, and immunology.*

- *Expanding expertise in tissue engineering approaches, patient-derived models, and spatial/multi-omics applications in cancer research.*

Postdoctoral Researcher, Tuskegee University | August 2025 – December 2025

Dept. of Biology, Tuskegee University, USA

- *Trained on scRNA-seq, and spatial transcriptomics (10x Xenium, Akoya).*
- *investigated immune–tumor interactions in ovarian cancer with focus on immune-cell phenotypes and RNA-mediated regulation.*

Graduate Research Assistant, Tuskegee University, AL, USA | January 2020 – July 2025

Dept. of Biomedical Sciences, Tuskegee University, USA

- *Conducted phage-display Biopanning to identify peptide and nanobody binders for TNBC targeting.*
- *Designed and produced lentiviral CAR-T constructs; performed T-cell transduction and functional assays.*
- *Developed and optimized multicolor flow cytometry, cytokine profiling, cytotoxicity assays, and proteomic target validation.*
- *Contributed to obesity-related cancer research evaluating adipocyte-induced immunomodulation.*

Research Assistant, National Research Centre, Egypt | 2013–2019

Dept. of Cell Biology, NRC, Egypt

- *Investigated MHC polymorphisms and host susceptibility to viral infections.*
- *Performed DNA/RNA extraction, PCR/qPCR, sequencing, and immunogenetic analyses.*
- *Gained experience in cell biology, molecular diagnostics, and vet-based animal handling.*

Internships and Training

- **Science for Development Institute (SCI4DI) Scholar** | USAID/Duke University, Washington DC | June 2024
- **Summer Cancer Research Education Program (SCREP) internship** | NIH-NCI, MSM/TU/UAB Partnership | June-July 2023
- **Visiting Scholar** | Molecular Genetics and Biotechnology | Limoges University, France | 2016
- **Molecular Biology Training Program** | Molecular Biology and Cloning | Yangzhou University, China | 2015

Awards & Recognitions

- **1st Place Award** | Southern Research's "Moving Science with STEM Stars" | October 2023
- **Institutional Champion Award** | NIH All of Us Researcher Academy | June 2023
- **Scientific Excellence Award** | CCTS, UAB | September 2022

Selected Publications

- King D., **Khodary M.G.**, et al. *Obesity influences key immunomodulators in breast cancer patients and cell lines.* *Cancers* 2022.
- **Khodary M.G.**, et al. *Triple negative breast cancer (TNBC) targeting CAR-T cell constructs with phage display-derived peptides.* *Cancer Res.* AACR 2024.
- **Khodary M.G.**, et al. *Loss of HSPD1 induces cellular plasticity in TNBC cells.* AACR 2023.

Conferences/Meetings

- Yale Cancer Research symposium | September 2025
- AACR Annual Meeting | April 2024, April 2023 | Poster presentations
- Cancer Research Symposium | July 2023 | Oral & poster presentation
- CEO Roundtable on Cancer | Nov 2022 | TU institutional representative