

Gamze B. Bulut, PhD
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EDUCATION

PhD, Genetics and Development 2014
University of Texas (UT) Southwestern Medical Center Dallas, TX
Dissertation: *Ubiquitination of EpoR and p85 in Ligand Induced EpoR Down-Regulation*

B.Sc., Molecular Biology and Genetics 2007
Bilkent University, Turkey

PROFESSIONAL APPOINTMENTS

Assistant Prof of Bioinformatics Aug 2025 – present
School of Life Sciences and Sustainability

Research Scientist/Lab Manager May 2024 – Jun 2025
Department of Surgery VCU Turner and Findlay Lab

Visiting Assistant Professor (taught Molecular Cell Biology and other courses) 2022-2024
Department of Biology- William and Mary

Research Associate 2021 - 2022
Pediatrics, Virginia Commonwealth University- Advisor: Judith Voynow, M.D.

Postdoctoral Fellow 2017 - 2021
Cardiovascular Research Center, University of Virginia - Advisor: Gary K. Owens, Ph.D.

Postdoctoral Researcher 2015 - 2017
Biochemistry and Molecular Biology, VCU - Advisor: Charles Chalfant, Ph.D.

AWARDS AND HONORS

College of William and Mary Summer Research Grant (\$5000) 2023

Children's Hospital Research Initiative Grant (\$7000) 2022

District of Columbia Women's Board Postdoctoral Fellow 2020

American Heart Association Postdoctoral Fellowship 2019 – 2020

Cardiovascular Research Center T32 Fellowship 2017 – 2019

American Heart Association Predoctoral Fellowship (\$50,000) 2012 – 2014

UT Southwestern Medical Center Graduate Student Organization Travel Award (\$750) 2013

UT Southwestern Medical Center GSO Poster Session 2010 – Top 5 Poster Award (\$250) 2010

Full Undergraduate/Graduate Scholarship 2003-2014

MENTORING RESEARCH

VCU Department of Surgery: Daily oversight and troubleshooting help for lab members: Fariha Imtiaz, PhD (post doc), Vi Nguyen (MD PhD student), Summer student: Bhoomika Kaur (High school student)

- Remote online research on single cell RNA sequencing analysis project with Anna Sepulveda (undergraduate student from William and Mary).

College of William & Mary:

- *Beryl Jiang and Yuqi Pan (2023)* investigated the changes in abundance and transcriptome of adipose tissue macrophages in response to obesity.
- *Caelen Grange, Anna Sepulveda (2023)* worked on obesity dependent changes in adipose tissue lymphatic microvasculature.
- *Melanie Jimenez, Tehya Niide and Morgan Montana (2023)* worked on obesity promoting transitions within the adipose tissue relevant to EndoMT.

UVA:

- *Melissa Luse (2019)* performed scRNAseq experiments using mesenteric adipose tissue samples from endothelial cell lineage tracing mouse model.
- *Lillian Waller M.D. (2018)* worked with me for one year when she was on a break from Medical School. Lillian learned mouse breeding, tamoxifen injections, genotyping, metabolic tests, harvesting mouse tissues for flow cytometry, RT-PCR and adipocyte size analysis and earned authorship on our recent journal article.
- *Undergraduates: Ana Tsiskarishvili (2019)* performed genotyping, immunofluorescence staining, atherosclerotic lesion composition analysis and adipocyte size measurements. *Sophia Kirmani (2019)* did atherosclerotic lesion analysis and genotyping.

PUBLICATIONS

1. Comparative Studies of potentially tumorigenic Advanced Glycation End Products (AGEs) in Dog Foods. Submitted 2025
2. Nadia Tasnim Ahmed, Apparao B. Kummarapurugu, Shuo Zheng, **Gamze Bulut**, Le Kang, Aashish Batheja, Adam Hawkrige *, Judith Voynow * Neutrophil elastase targets select proteins on human blood monocyte-derived macrophage cell surfaces. *International Journal of Molecular Sciences* 2024 Dec 4;25(23):13038. <https://doi.org/10.3390/ijms252313038>
3. **Bulut, G. B.**, G. F. Alencar, K. M. Owsiany, A. T. Nguyen, S. Karnewar, R. M. Haskins, L. K. Waller, O. A. Cherepanova, R. A. Deaton, L. S. Shankman, S. R. Keller, and G. K. Owens. "Klf4 (Kruppel-Like Factor 4)-Dependent Perivascular Plasticity Contributes to Adipose Tissue Inflammation." *Arterioscler Thromb Vasc Biol* 41, no. 1 (Jan 2021): 284-301. <https://dx.doi.org/10.1161/ATVBAHA.120.314703>.
4. **Bulut, G. B.**, R. Sulahian, Y. Ma, N. W. Chi, and L. J. Huang. "Ubiquitination Regulates the Internalization, Endolysosomal Sorting, and Signaling of the Erythropoietin Receptor." *J Biol Chem* 286, no. 8 (Feb 25 2011): 6449-57. <https://dx.doi.org/10.1074/jbc.M110.186890>.
5. **Bulut, G. B.**, R. Sulahian, H. Yao, and L. J. Huang. "Cbl Ubiquitination of P85 Is Essential for Epo-Induced Epor Endocytosis." *Blood* 122, no. 24 (Dec 5 2013): 3964-72. <https://dx.doi.org/10.1182/blood-2013-05-506212>.
6. Craig, J. E., J. N. Miller, R. R. Rayavarapu, Z. Hong, **G. B. Bulut**, W. Zhuang, S. M. Sakurada, J. Temirov, J. A. Low, T. Chen, S. M. Pruett-Miller, L. J. Huang, and M. B. Potts. "Mekk3-Mek5-Erk5 Signaling Promotes Mitochondrial Degradation." *Cell Death Discov* 6 (2020): 107. <https://dx.doi.org/10.1038/s41420-020-00342-7>.

7. Deaton, R. A., **G. Bulut**, V. Serbulea, A. Salamon, L. S. Shankman, A. T. Nguyen, and G. K. Owens. "A New Autosomal Myh11-Creer(T2) Smooth Muscle Cell Lineage Tracing and Gene Knockout Mouse Model-Brief Report." *Arterioscler Thromb Vasc Biol* 43, no. 2 (Feb 2023): 203-11. <https://dx.doi.org/10.1161/ATVBAHA.122.318160>.
8. Dunaway, L. S., M. A. Luse, S. Nyshadham, G. Bulut, G. F. Alencar, N. W. Chavkin, M. Cortese-Krott, K. K. Hirschi, and B. E. Isakson. "Obesogenic Diet Disrupts Tissue-Specific Mitochondrial Gene Signatures in the Artery and Capillary Endothelium." *Physiol Genomics* 56, no. 2 (Feb 1 2024): 113-27. <https://dx.doi.org/10.1152/physiolgenomics.00109.2023>.
9. Dutchak, P. A., S. Laxman, S. J. Estill, C. Wang, Y. Wang, Y. Wang, **G. B. Bulut**, J. Gao, L. J. Huang, and B. P. Tu. "Regulation of Hematopoiesis and Methionine Homeostasis by Mtorc1 Inhibitor Nprl2." *Cell Rep* 12, no. 3 (Jul 21 2015): 371-9. <https://dx.doi.org/10.1016/j.celrep.2015.06.042>.
10. Huang, L. J., Y. M. Shen, and **G. B. Bulut**. "Advances in Understanding the Pathogenesis of Primary Familial and Congenital Polycythaemia." *Br J Haematol* 148, no. 6 (Mar 2010): 844-52. <https://dx.doi.org/10.1111/j.1365-2141.2009.08069.x>.
11. Karnewar, S., V. Karnewar, R. Deaton, L. S. Shankman, E. D. Benavente, C. M. Williams, X. Bradley, G. F. Alencar, **G. B. Bulut**, S. Kirmani, R. A. Baylis, E. R. Zunder, H. M. den Ruijter, G. Pasterkamp, and G. K. Owens. "Il-1beta Inhibition Partially Negates the Beneficial Effects of Diet-Induced Lipid Lowering." *bioRxiv* (Oct 14 2023). <https://dx.doi.org/10.1101/2023.10.13.562255>.
12. Kim, M., N. T. Vu, X. Wang, **G. B. Bulut**, M. H. Wang, C. Uram-Tuculescu, R. Pillappa, S. Kim, and C. E. Chalfant. "Caspase 9b Drives Cellular Transformation, Lung Inflammation, and Lung Tumorigenesis." *Mol Cancer Res* 20, no. 8 (Aug 5 2022): 1284-94. <https://dx.doi.org/10.1158/1541-7786.MCR-21-0905>.
13. Potts, M. B., H. S. Kim, K. W. Fisher, Y. Hu, Y. P. Carrasco, **G. B. Bulut**, Y. H. Ou, M. L. Herrera-Herrera, F. Cubillos, S. Mendiratta, G. Xiao, M. Hofree, T. Ideker, Y. Xie, L. J. Huang, R. E. Lewis, J. B. MacMillan, and M. A. White. "Using Functional Signature Ontology (Fusion) to Identify Mechanisms of Action for Natural Products." *Sci Signal* 6, no. 297 (Oct 15 2013): ra90. <https://dx.doi.org/10.1126/scisignal.2004657>.
14. Shin, J., S. Tkachenko, M. Chaklader, C. Pletz, K. Singh, **G. B. Bulut**, Y. M. Han, K. Mitchell, R. A. Baylis, A. A. Kuzmin, B. Hu, J. D. Lathia, O. Stenina-Adognravi, E. Podrez, T. V. Byzova, G. K. Owens, and O. A. Cherepanova. "Endothelial Oct4 Is Atheroprotective by Preventing Metabolic and Phenotypic Dysfunction." *Cardiovasc Res* 118, no. 11 (Aug 24 2022): 2458-77. <https://dx.doi.org/10.1093/cvr/cvac036>.
15. Vu, N. T., M. A. Park, M. D. Shultz, **G. B. Bulut**, A. C. Ladd, and C. E. Chalfant. "Caspase-9b Interacts Directly with Ciap1 to Drive Agonist-Independent Activation of Nf-Kappab and Lung Tumorigenesis." *Cancer Res* 76, no. 10 (May 15 2016): 2977-89. <https://dx.doi.org/10.1158/0008-5472.CAN-15-2512>.
16. Zheng, S., G. B. Bulut, A. B. Kummarapurugu, J. Ma, and J. A. Voynow. "Neutrophil Elastase Degrades Histone Deacetylases and Sirtuin 1 in Primary Human Monocyte Derived Macrophages." *Int J Mol Sci* 25, no. 8 (Apr 12 2024). <https://dx.doi.org/10.3390/ijms25084265>.
17. Zheng, S., A. B. Kummarapurugu, **G. B. Bulut**, A. Syed, L. Kang, and J. A. Voynow. "Neutrophil Elastase Activates the Release of Extracellular Traps from Copd Blood Monocyte-Derived

Macrophages." *Clin Transl Sci* 16, no. 12 (Dec 2023): 2765-78.

<https://dx.doi.org/10.1111/cts.13671>.

TECHNICAL PROFICIENCIES

Bioinformatics: R programming using RStudio (EdX courses, Swirl, Analysis of Single Cell RNA Sequencing data using Seurat Package, UMAP Analysis; Generating Clusters & Top Genes Lists; Feature Plots; Dimension Plots, Self-learning Python as a coding language. Data mining using Rstudio to generate scatter plots, PCA, tSNE, correlation matrices violin plots etc. Course work : BIOS601, BIOS 524, BIOS 602 (Spring 2025), BIOS 606 (Spring 2025), EdX (Statistics and R, Data Science: R Basics, Data Science: Visualization, Intro to Linear Models and Matrix Algebra, Statistical Inference and Modeling for High-throughput Experiments).

Flow Cytometry: BD FACS Calibur; BD FACS Canto; LSRII; Fortessa; Cytex Aurora; Imagestream X; Surface & Intracellular Levels; Phospho-flow; Multiplexed Panels (up to 18 colors); Cytot Panel Design. Flow cytometry data analysis using Flow Jo, FCS Express. Introductory level TSNE plotting using Cytot data and CytoBank.

Biochemistry: Western Blotting, SDS-PAGE, Immunoprecipitation (IP), Co-IP, Surface IP, Coomassie Blue, Silver Staining, Detection of Ubiquitinated Proteins, In-Vitro Ubiquitination Assay; Purification Of Proteins For Mass Spectrometric Analysis (Phospho-Site Identification); EMSA RNA-Protein Binding Assays; HDAC and HAT activity assays using commercial plate-based assays. ELISA And Plate-Based Assays, Standard Curves; Curve Fitting.

Tissue Culture: Primary human blood monocyte derived macrophage culture. Treatment of cells with inhibitors or neutrophil elastase to obtain cell lysates or fractionated nuclear and cytoplasmic extracts. Transfection, siRNA Mediated Knock Down; Protein Expression; Preparation of Stable Cell Lines (Batch and Clonal); Setting Up MTT Assay; Generation of Retrovirus, Lentiviral shRNA Design & Usage for Knockdown. Primary human prostate cancer fibroblast and epithelial cell culture. Will learn Organoplate system from Mimetas, Xelligence.

Animal Handling: Generation and maintenance of quadruple transgenic mouse lines, genotyping, perfusion, harvesting tissues including brachiocephalic arteries, timed pregnancies, GTT, ITT, blood collection, cheek bleeding. Will learn orthotopic prostate cancer model as well as xenograft.

Imaging: Light Microscopy; Confocal Microscopy (Leica SP5, Zeiss LSM, Zeiss 700, 710, 880) and Detecting 3D Colocalization of Proteins (IMARIS). Image J Quantification of Pixellation. IHC for Ki67.

Molecular Biology: Cloning; PCR; Site-directed Mutagenesis; Agarose Gel Electrophoresis; Expression & Purification of Proteins (in Bacteria & in SF9 cells); RT-qPCR; Oligo Design.

POSTER PRESENTATIONS

1. Boxiao Ding, Gamze Bulut, Tamarea Jones, Mary Ellis Logan, Nolan Wages, Victoria J Findlay, David P Turner Comparative Studies of potentially tumorigenic Advanced Glycation End Products (AGEs) in Dog Foods. VA-ASA meeting November 8th 2024 and 2024 Walter Lawrence Jr., MD Research Retreat Sept 28th 2024.
2. Neutrophil elastase (NE) mediated degradation of histone deacetylases in macrophages promotes High Mobility Group Box1 export from nucleus to cytosol. NACFC 2022.

3. Klf4 dependent plasticity of perivascular cells regulates obesity induced inflammation and endothelial cell polarization in adipose tissue. Arteriosclerosis, Thrombosis, and Vascular Biology (ATVB) Vascular Discovery Meeting 2020. (Invited talk)
4. Lineage tracing and scRNA sequencing reveals Klf4 dependent perivascular cell phenotypes within epididymal adipose tissue associated with diet induced obesity, Cedars Sinai Medical Center, Los Angeles (Host Dr. Moshe Arditi), March 9th, 2020 (Canceled due to Covid-19).
5. Klf4 dependent plasticity of perivascular cells is detrimental for diet induced obesity associated adipose tissue inflammation and fibrosis. American Heart Association (AHA) Scientific Sessions 2019. (Poster)
6. Single cell RNA sequencing of Smooth Muscle and Pericyte derived macrophage-like cells within epididymal fat. Gordon Research Conference, Vascular Biology 2019 (Poster)
7. Identification of smooth muscle derived macrophages as a novel potential source of tissue resident macrophages. ATVB 2018 (Poster)
8. Cbl ubiquitination of p85 is essential for Epo-induced EpoR endocytosis. Annual American Association of Cancer Research Meeting 2013. (Invited talk)

PROFESSIONAL AFFILIATIONS

American Heart Association	2018 - 2022
North American Vascular Biology Organization (free subscription granted)	2018 - present
Microcirculatory Society	2021 - 2022

REVIEWING ACTIVITIES

- Peer-reviewed Journals: Arteriosclerosis, Thrombosis, and Vascular Biology, Molecular Cancer Research
- Awards and Grants: Gordon Research Conference Best Graduate Student poster award

SERVICE AND COMMUNITY OUTREACH

Fall 2023 Intro Bio Welcome Session 2023

Helped design and implement an Ice Cream Social for Introductory Biology students (~400 students) to get to visit 5 professors offices and get stamps from each one.

Honors Thesis Committee: Beryl Jiang (Computer Science) and Mia Houdek (Biology), 2024

Session chair, Graduate and Honors Research Symposium at William and Mary, Honors 6, 2023.

American Heart Association DC Women's Board, *Attended Fundraiser Fashion Show in Washington, DC. 2020*

Session Co-chair: Gordon Research Conference on Vascular Biology, Ventura CA, 2019

Career Development Talk Series Panelist 2019

- *Panel discussion about balancing family and science.*