

# Abdullah “Arby” Abood

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US citizen

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## Research Experience

2018-present | Ph.D. candidate | Advisor: Dr. Charles Farber | University of Virginia | Center for Public Health Genomics

Project: ***Genetic analysis of transcriptomic and proteomic data to elucidate the genetics of osteoporosis***

- Informed bone mineral density (BMD) genome-wide association studies (GWAS) by integrating splice quantitative trait loci (sQTL) data with Bayesian colocalization analysis. The results were further refined by using data from long-read RNAseq, and proteomics followed by experimental validation in-vitro. This enabled us to implicate causal genes in osteoporosis.
- Systematically identified long non-coding RNAs potentially responsible for the effect of BMD GWAS loci using expression quantitative trait loci (eQTL) Bayesian colocalization, transcriptome-wide association studies (TWAS), and allelic imbalance analyses. Due to this work, we were able to shed light on the non-coding aspects of the bone transcriptome and their role in osteoporosis.
- Characterized the landscape of isoforms and proteoforms in the process of osteoblast differentiation by combining long-read RNAseq data and proteomics data and applying differential expression analysis, differential splicing analysis, differential isoform usage, and other statistical approaches.

2015-2018 | Graduate Assistant | Advisor: Dr. Vincent Richards | Clemson University | Department of Biological Sciences

Project: ***Comparative metagenomics of dental plaque and gut microbiomes***

- Investigated human oral and gut microbiome community dynamics using both 16S and Whole Genome Shotgun (WGS) metagenomics data analyses. This enabled us to understand host-microbiome interaction and provide detailed abundance counts at bacterial strain level resolution.
- Implemented multiple bioinformatics pipelines and provided detailed instructions on their usage to assist lab partners and collaborators with their research needs.
- Managed day-to-day laboratory operations including ordering, and Linux server maintenance.
- Gained experience in the bash/Linux command line interface (CLI), Python, and R.

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## Publications

### Published

**Using “-omics” data to inform genome-wide association studies (GWASs) in the osteoporosis field**

Abdullah Abood and Charles R. Farber. *Current Osteoporosis Reports*. DOI: 10.1007/s11914-021-00684-w

**Genetic Variability affects the Skeletal Response to Immobilization in Founder Strains of the Diversity Outbred Mouse Population**

Michael A. Friedman, Abdullah Abood, Bhavya Senwar, Yue Zhang, Camilla Reina Maroni, Virginia L. Ferguson, Charles R. Farber, Henry J. Donahue. *Bone Reports*. DOI: 10.1101/2020.06.26.174326

**Lentil (*Lens culinaris Medikus*) Diet Affects the Gut Microbiome and Obesity Markers in Rat**

Niroshan Siva, Casey R. Johnson, Vincent Richards, Elliot D. Jesch, William Whiteside, Abdullah Abood, Pushparajah Thavarajah, Susan Duckett, and Dil Thavarajah. *Journal of Agricultural and Food Chemistry*. DOI: 10.1021/acs.jafc.8b03254

### In Review

**Identification of known and novel long non-coding RNAs potentially responsible for the effects of BMD GWAS loci**

Abdullah Abood, Larry Mesner, Will Rosenow, Basel Al-Barghouthi, Elise F. Morgan, Louis C. Gerstenfeld, Charles R. Farber. *Journal of Bone and Mineral Research*. DOI: <https://doi.org/10.1101/2021.11.04.467171>

**An Interactive Protocol for in-classroom DNA Extraction**

Danica C. Levesque, Athena L. Wallis, Jenna Daypuk, Jesse Petahtegoose, Mitchell Slobodian, Ian Black, Jessica M. Vélez, *Abdullah Abood*, Marah H. Wahbeh, Romina B. Cejas, Angel F. Cisneros, Laerie McNeil, Kento Konno, Lissa McGregor, Birha Faraqji, Carla Bautisa, Thomas J. S. Merritt. *CourseSource*. DOI: TBD

### *In Preparation*

**Landscape of isoforms that regulate osteoblast differentiation and contribute to informing bone mineral density GWAS**  
*Abdullah Abood*, Erin D. Jeffery, Jared Saquing, Ben T. Jordan, Larry L. Mesner, Meesha Vullikanti, Charles R. Farber, Gloria M. Sheynkman

### **Single Cell RNA-seq Analysis of Bone Marrow-Derived Osteoblasts**

*Abdullah Abood\**, Will Rosenow\*, Gina Calabrese\*, Larry Mesner\*, Emily A. Farber, Basel Al-Barghouthi, Daniel Brooks, Mary Boussein, Steven Tommasini, Mark Horowitz, Suna Onengut-Gumuscu, Clifford Rosen, Charles Farber.

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### **Grants and Awards**

2021 Young Investigator Travel Grant. American Society for Bone and Mineral Research (ASBMR)  
2019-2021 T32LM012416. "Transdisciplinary Big Data Science Training at UVA." Donald Brown, PhD; Thomas Loughran, MD; Jason Papin (contact), PhD; and Kevin Skadron, PhD.

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### **Oral Presentations**

#### **Identifying known and novel long non-coding RNAs potentially responsible for BMD GWAS associations**

- Center for Public Health Genomics Research in Progress seminar 2021.
- Biochemistry and Molecular Genetics departmental seminar 2021.

#### **Elucidating the genetics of osteoporosis using systems genetics approaches**

- Biochemistry and Molecular Genetics departmental seminar 2020.

#### **The tooth that went rogue: comparative metagenomics of site-specific dental plaque samples**

- Clemson Biology Annual Student Symposium (CBASS) 2018.
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### **Poster Presentations**

#### **Identifying known and novel long non-coding RNAs potentially responsible for BMD GWAS associations**

- American Society for Bone and Mineral Research (ASBMR) 2021.
- American Society of Human Genetics (ASHG) 2021.

#### **Differential Transcriptomic Response to Unloading in Bones from Diversity Outbred Mouse Founder Strains.**

- American Society for Bone and Mineral Research (ASBMR) 2019.
- Orthopaedic Research Society (ORS) 48th International Musculoskeletal Biology Workshop 2019.
- Biochemistry and Molecular Genetics Symposium 2019.

#### **Validation of in-house Whole Genome Shotgun (WGS) metagenomics analysis pipeline**

- Clemson Biology Annual Student Symposium (CBASS) 2018.
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### **Mentoring Experience**

2021-present University of Virginia undergraduate Meesha Vullikanti  
2015-2018 Clemson university undergraduates Ken Parker & Mary Mitchell

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### **Teaching Experience**

2021 Teaching Assistant – Recent Advances in Public Health Genomics

2019-2021	Teaching Assistant – Core Course in Integrative Biosciences
2015-2018	Teaching Assistant & Laboratory Instructor – Anatomy & Physiology
2013-2013	Student Mentor – Higher Achievement
2012-2013	Undergraduate Learning Assistant – General Biology

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### Professional Experience Prior to Academia

2014-2015	Saudi Arabian Cultural Mission   Academic Affairs Consultant
2013-2015	Kensington Pathology Consultants   Medical Laboratory Biologist
2012-2014	Hospitality Industry   Guest Services Manager
2009-2012	Hospitality Industry   Front Desk Supervisor

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### Professional and Leadership Activities

2019-present	Center for Public Health Genomics Computation Club   Member
2019-present	Data Science and Analytics Club at the University of Virginia   Member
2018-2021	AAAS/Science Program for Excellence in Science   Member
2018-2020	Science Policy Initiative at the University of Virginia   Event coordinator
2017-2018	American Society for Microbiology   Student member
2016-2017	Biological Sciences Graduate Student Association   Event coordinator

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### Bioinformatics Training

2021	DataCamp Data Scientist, Analyst, Programmer with Python certificates
2020	DataCamp Data Scientist, Analyst, Programmer with R certificates
2020	Functional Genetics Boot Camp at Columbia University
2020	Advanced Gene Mapping Course at Rockefeller University
2017	Clemson University Genomics Workshop

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### Community Outreach

2021-present	Journal of Emerging Investigators   Reviewer
2021	GSA Multilingual Seminar (Arabic)   Organizer
2020	HooHacks   Idea Generation Mentor
2019-present	Skype A Scientist   Speaker
2017	Pendleton High Talks   Guest speaker
2017	Relay for Life   Volunteer
2017	Clemson Elementary Science Fair   Poster judge
2017	DNA Day at Greenville Zoo   Presenter
2013	Higher Achievement DC   Student mentor

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### Education

2018-present	Ph.D. in Genomics and Bioinformatics, University of Virginia, Charlottesville, VA, USA ( <i>GPA: 3.92</i> )
2015-2018	M.Sc. in Microbiology (Genomics), Clemson University, Clemson, SC, USA ( <i>GPA: 4.00</i> )
2009-2013	B.Sc. in Biology, George Mason University, Fairfax, VA, USA ( <i>GPA: 3.93</i> )

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### Honors

2013-present	Membership of the Phi Beta Kappa Honor Society
2013	Graduated <i>Summa Cum Laude</i>
2012	Iraqi Cultural Center's Peace Ambassador Award
2010-2013	Dean's List and President's List