Muhammad Arif, Ph.D.

Postdoctoral Fellow at National Institute of Health (NIH)
me@muharif.net
http://muharif.net [hidden]

Expertise

Machine Learning, Network Analysis, Multi-Omics, Transcriptomics, Proteomics, Metabolomics

Programming

Python, R, MATLAB, C, PHP, Shell Script

Teaching Experiences

Bioinformatics, Applied Bioinformatics, Systems Biology, Statistics, High Performance Computing, Thesis Supervision

Languages

English ★★★★★
Swedish ★★☆☆☆
Indonesian ★★★★★

Work Experiences

Postdoctoral Fellow | National Institutes of Health (NIH)
2021 – Present | Rockville, MD, United States of America
Jointly appointed by Laboratory of Cardiovascular Physiology and Tissue Injury (LCPTI), and Section on Fibrotic Disorders (SFD) at National Institute of Alcohol Abuse and Alcoholism (NIAAA)

Research Assistant | Science for Life Laboratory
2016 – 2021 | Stockholm, Sweden
Genomics and transcriptomics data analysis. Carried on as part of doctoral education in the same research group.

Systems Engineer | Cisco Systems
2010 – 2014 | Singapore, Singapore
Part of Global Virtual Engineering team, subject matter expert in Enterprise Routing. Certifications: CCNP, CCDP, and CCIE (Written)

Education

PhD | KTH Royal Institute of Technology & SciLifeLab, Sweden
2017 – 2021
Systems Biology of Human Diseases.
Thesis Title: Systems and Network-based Approaches to Complex Metabolic Diseases.
Supervisors: Prof. Adil Mardinoglu and Prof. Mathias Uhlén

Master of Science | KTH Royal Institute of Technology, Sweden
2014 – 2016
European Master of Research on Information and Communication Technologies (MERIT). Double degree program with Universitat Politècnica de Catalunya (UPC), Barcelona.
Supervisors: Dr. Viktoria Fodor (KTH) and Dr. Albert Cabellos (UPC)

Bachelor of Engineering | Institut Teknologi Bandung, Indonesia
2006 – 2011
Electrical Engineering with concentration track in Control Engineering.

Key Publications

Arif M, et al. (2021). Integrative transcriptomic analysis of tissue-specific metabolic crosstalk after myocardial infarction. eLife.
Arif M, et al. (2021). iNetModels 2.0: an interactive visualization and database of multi-omics data. Nucleic Acids Research.
Full Publications: https://scholar.google.com/citations?hl=en&user=F-8477kAAAAJ
Total Publications: 37 | **Citations:** 2911 | **H-index:** 15 (Google Scholar, 20 October 2022)

Awards and Honors

- NIH Summer Mentor Award | 2022
- 2nd Place in NIAAA Trainee Day Data Blitz | 2022

Teaching and Mentoring Experience

National Institute of Health:

- Systems Biology Summer Interns (2 Students) | Supervisor | 2022
- "Data-Driven Biology: The Future of Medical Research" Journal Club | Leader | 2022

King's College London (Virtual due to Covid-19):

- Introduction to Programming and Coding (7NNNMHD2) | Lecturer | 2020, 2021, 2022
- Introduction to Linux (7NNNMHD2) | Lecturer | 2020, 2021, 2022
- Statistical Analysis and Probability (7NNNMHD2) | Lecturer | 2020, 2021, 2022

KTH Royal Institute of Technology:

- Applied Bioinformatics (DD2040) | Teaching Assistant | 2017-2018
- Bachelor's degree Project in Biotechnology (BB200X) | Supervisor | 2018
- Systems Biology of Human Metabolism and Gut Microbiome | Organizer and Lecturer | 2018, 2020
- Bioinformatics (BB24410) | Teaching Assistant | 2019, 2020
- Systems Biology (CB2030) | Teaching Assistant | 2019, 2020

Sover Academy (Virtual):

- Basic Programming (in Indonesian) | Organizer and Lecturer | 2020

Scientific Leadership & Activities

- Leader of "Data-Driven Biology: The Future of Medical Research" Summer Journal Club at NIH | 2022
- Co-organizer of "BYOB: Bring Your Own Bioinformatics" at NIH | 2022 - Present
- Co-organizer of NIH Bioinformatics Coordination Initiative | 2022 - Present
- Judge in 18th NIH Annual Graduate Student Research Symposium | Bethesda, MD | 2021
- Judge in NIH Postbaccalaureate Day 2022 | Bethesda, MD | 2022

Academic Service

- Co-Editor in "Biophysics approaches to investigate multi-organ alcohol-induced damages" Special Issue, Frontiers in Molecular Biosciences | 2022, Accepting Submissions
- Co-Editor in "Integrative Omics Study for Clinical Liver Disease" Special Issue, Journal of Clinical and Translational Hepatology | 2022, In preparation
- Active Peer-Review Contributions (Frontiers, Bioinformatics, PeerJ, Computational and Structural Biotechnology Journal, Scientific Reports)

Presentations at International Conferences and Meetings

- Keystone Symposia: Tissue Fibrosis and Repair (Poster) | Keystone, CO | 2022
- Systems Biology of Mammalian Cells (Poster) | Bremen, DE | 2018
- Chan-Zuckerberg Science Retreat (Poster) | Stockholm, SE | 2018

Trainings

Technical:

- Introduction to Biomedicine | Stockholm, SE | KTH | 2019
- Tools for Reproducible Research | Stockholm, SE | NBIS | 2018
- Analysis of Data from High-Throughput Molecular Biology Experiments | Stockholm, SE | KTH | 2017
- Single Cell RNA Analysis | Uppsala, SE | NBIS | 2017

Teaching and Communications:

- Scientists Teaching Science | Bethesda, MD | NIH | 2022
- Communicating Research beyond the Academy | Stockholm, SE | KTH | 2020
- Visualize Your Science | Stockholm, SE | KTH | 2019
- Writing Scientific Articles | Stockholm, SE | KTH | 2019
- Supervision Methodology for Diploma Projects | Stockholm, SE | KTH | 2017
- Basic Communication and Teaching | Stockholm, SE | KTH | 2017

Others:

- Ethics in Research Training | Bethesda, MD | NIH | 2022
- Engineering for a Sustainable Society | Stockholm, SE | KTH | 2019

Publications

Scientific Articles (Peer-reviewed)

37. Zhang C. et al (2022) Discovery of therapeutic agents targeting PKLR for NAFLD using drug repositioning. *EBioMedicine*.
36. Emanuelsson E., et al (2022). MRI characterization of skeletal muscle size and fatty infiltration in long-term trained and untrained individuals. *Physiological Report*.
35. Ambikan A. T., et al (2022). Multiomics personalized network analyses highlight progressive disruption of central metabolism associated with COVID-19 severity. *Cell Systems.*
34. Lam S., et al (2022). Machine Learning Analysis Reveals Biomarkers for the Detection of Neurological Diseases. *Frontiers in Molecular Neuroscience*.
33. Zeybel M, **Arif M*,**, Li X., et al (2022). Multi-omics analysis reveals the impact of microbiota on host metabolism in hepatic steatosis. *Advanced Science*. ***Co-first author**
32. Rajesh M, et al (2022). Cannabinoid receptor 2 activation alleviates diabetes-induced cardiac dysfunction, inflammation, oxidative stress, and fibrosis. *Geroscience*.
31. Karlsson M, et al (2022). Genome-wide annotation of protein-coding genes in pig. *BMC biology*.
30. Bayraktar A, et al (2021). Revealing the Molecular Mechanisms of Alzheimer's Disease Based on Network Analysis. *International journal of molecular sciences*.
29. Zeybel M, Altay O, **Arif M***, et al (2021). Combined Metabolic Cofactor Supplementation Reduces Liver Fat in Nonalcoholic Fatty Liver Disease. *Molecular Systems Biology*. ***Co-first author**
28. Zhong W, et al (2021). Next generation plasma proteome profiling of COVID-19 patients with mild to moderate symptoms. *eBioMedicine*.
27. Lam S, et al (2021). Systems analysis reveals ageing-related perturbations in retinoids and sex hormones in Alzheimer's and Parkinson's diseases. *Biomedicines*.
26. Yang H, et al (2021). A network-based approach reveals the dysregulated transcriptional regulation in non-alcohol fatty liver disease. *iScience*.
25. Andersson L, et al (2021). Glucosylceramide synthase deficiency in the heart compromises β1-adrenergic receptor trafficking. *European Heart Journal*.
24. Karlsson M, et al (2021). A single-cell type transcriptomics map of human tissues. Science Advances.
23. Altay O, **Arif M***, Li X, et al (2021). Combined Metabolic Activators Accelerates Recovery in Mild-to-Moderate COVID-19. *Advanced Science*. ***Co-first author**

22. Li X, et al (2021). Stratification of clear cell renal cell carcinoma patients to facilitate drug repositioning. *iScience*.
21. **Arif M**, et al (2021). Integrative transcriptomic analysis of tissue-specific metabolic crosstalk after myocardial infarction. *eLife*. **First Author**
20. **Arif M,** et al (2021). iNetModels 2.0: an interactive visualization and database of multi-omics data. *Nucleic Acids Research*. **First Author**
19. Smati**,** et al (2021). Arif M, et al (2021). Integrative study of diet-induced mouse models of NAFLD identifies PPARα as a sexually dimorphic drug target. *Gut*.
18. Kolk, BW, et al (2021) Molecular pathways behind acquired obesity: adipose tissue and skeletal muscle multiomics in monozygotic twin pairs discordant for BMI. *Cell Reports Medicine.*
17. Doran S., et al. (2021) Multi-omics approaches for revealing the complexity of cardiovascular disease. *Briefings in Bioinformatics*.
16. Mahdessian, D, et al. (2021) Spatiotemporal dissection of the cell cycle with single-cell proteogenomics. *Nature*.
15. Li, X, et al. (2021). Discovery of functional alternatively spliced PKM transcripts in human cancers. *Cancers*.
14. Tebani, A, et al. (2020). Integration of molecular profiles in a longitudinal wellness profiling cohort. *Nature Communications*.
13. Chapman M, et al. (2020) Skeletal muscle transcriptomic comparison between long-term trained and untrained men and women. *Cell Reports*.
12. Zhang C, Bjornson E, **Arif M*,** et al. (2020) The acute effect of metabolic cofactor supplementation: a potential therapeutic strategy against non-alcoholic fatty liver disease. *Molecular Systems Biology*. ***Co-first author**
11. Li X, et al. (2020) Classification of clear cell renal cell carcinoma based on PKM alternative splicing. *Heliyon*.
10. Sayitoglu EC, et al. (2020). Boosting Natural Killer Cell-Mediated Targeting of Sarcoma Through DNAM-1 and NKG2D. *Frontiers in Immunology*.
9. Klevstig M, et al. (2019) Cardiac expression of the microsomal triglyceride transport protein protects the heart function during ischemia. *Journal of molecular and cellular cardiology*.
8. Liu Z, et al. (2019) Pyruvate kinase L/R is a regulator of lipid metabolism and mitochondrial function. *Metabolic Engineering*.
7. Benfeitas R, et al. (2019) Characterization of heterogeneous redox responses in hepatocellular carcinoma patients using network analysis. *eBiomedicine*.
6. Zhang, C, et al. (2019) Elucidating the reprograming of colorectal cancer metabolism using genome-scale metabolic modeling. *Frontiers in oncology*.
5. Lovric A, et al. (2018) Characterization of different fat depots in NAFLD using inflammation-associated proteome, lipidome and metabolome. *Scientific Reports*.
4. Zhang C, et al. (2018) ESS: a tool for genome-scale quantification of essentiality score for reaction/genes in constraint-based modeling. *Frontiers in Physiology*.
3. Bidkhori G, et al. (2018) Metabolic network-based identification and prioritization of anti-cancer targets based on expression data in hepatocellular carcinoma. *Frontiers in Physiology*.
2. Lee S, Zhang C, **Arif M**, et al. (2017) TCSBN: a database of tissue and cancer specific biological networks. *Nucleic Acids Research*. **Co-first author**
1. Uhlen M, et al. (2017) A pathology atlas of the human cancer transcriptome. *Science*.

Theses

1. **Arif M**. (2021). Systems and Network-based Approaches to Complex Metabolic Diseases. PhD Thesis.
2. **Arif M.** (2016). Scalable 5-Tuple Packet Classification in Overlay Network-Based SDN. M.Sc. Master Thesis.