Muhammad Akhtar Ali

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Education

PhD Medical Sciences 2014
Uppsala University, Sweden

Awards & Grants

2021
NRPU, HEC Pakistan 11MPKR
2019
Wenner-Gren Travel Grant
2007
PhD Scholarships:
Cultural Exchange China
HEC Pak. indigenous
HEC Pak. overseas

Teaching & Supervision

Research Supervision:
PhD & master students
Teaching:
PhD & master Courses

Management

Scientific & Technical Leader
Project manager
Lab. Manager

Editor & Reviewer

International General of Genetics and genomics
Journal of Cancer Research
Brazilian Journal of Medical and Biological Research
Pakistan Journal of Zoology

Short Profile

- Experienced Research Scientist with a robust background in Molecular Genetics, Genome Editing, Bioinformatics, Cell and Molecular Biology. Demonstrated expertise includes the generation of over 15 isogenic cell models, elucidating the roles of various genetic variations in diverse cancers, resulting in the publication of 18 research articles. Additionally, successfully identified and validated two anti-saprolegnia drugs for the aquaculture industry.
- A results-oriented and dedicated professional with a proven ability to meet deadlines in a fast-paced work environment. Demonstrates excellence in developing novel methods, gaining insightful perspectives, and enhancing mechanistic understanding of mutations and drug targets in diverse areas such as cancers, neural disorders, and saprolegniasis.
- An outstanding team player and adept at fostering fruitful collaborations across various facets of basic and applied research. Instrumental in driving projects that have resulted in the publication of 18 peer-reviewed scientific articles.

Experience

2019-Present: Assistant Prof., University of the Punjab, Pakistan

- Successfully secured research funding, supervised, and continue to supervise several PhD and master students. Published several research articles. Taught and continue to teach various PhD level courses.

2015-2019: Researcher, Uppsala University, Uppsala, Sweden

- Independently designed and implemented **CRIPSR-Cas** system to generated 5 knockout, one knockin, once gene replacement and 2 large genomic deletion in various human and other mammalian cells and successfully investigated phenotype of these genetic alterations. Also investigated the various phenotypes of these isogenic cell models.
- Successfully and independently performed trouble shooting and implemented **HiC** and **RNA-seq** to reveal the 3D genome conformation and differential whole transcriptome profiles of isogenic cell models generated, respectively.
- Successfully Identified, acquired, organized, and utilized external NGS-sequencing services.
- Successfully taught master level comparative genomics course

2008-2014: PhD Candidate, Uppsala University, Uppsala, Sweden

- Successfully established cell culture lab and implemented the rAAV-based genome editing in human somatic cells. Generated 11 isogenic cell models of cancer mutations and studied their phenotypes.
- Independently conceived two projects and lead their successful completions to detect cancer mutations *in situ*, generate cell models and their phenotypes.
- Successfully, independently contributed and collaborated to establish transposon mutagenesis-based forwards genetic screens in the lab.

Certifications

1. Regulatory Affairs Certificate (**RAC**), Svensk Medicin AB
2. Good Laboratory Practice (**GLP**), Svensk Medicin AB
3. Good Distribution Practices (**GDP**), Svensk Medicin AB
4. Applied Project Management, Wenell Management AB
5. **FELASA** category C, Uppsala University
6. Whole Transcriptome Data Analysis and single cells
7. RNA-seq data analysis, EMBL, Heidelberg, Germany
8. Teacher Training Course, Uppsala University

Skill Set

Molecular Genetics:

RNA-seq, HiC, ChIP-seq & Amplicon sequencing, Whole exome sequencing for disease variants, Massively Parallel Reporter Assay (MPRA), Forward and Reverse Genetic screens, Transposon mutagenesis, DNA, RNA & Proteins extraction, recombinant DNA techniques, reverse transcription for gene expression, Gel electrophoresis.

Molecular and Cell Biology:

NGS library preparation, Vector designing and constructions, Molecular cloning (of all sorts) especially Gibson assembly, gateway, Goldengate and TA cloning, Plasmid preparation, RT-qPCR, PCR (of all sorts) especially Splinkerrette and fusion PCR, ELISA, Sanger sequencing and protein electrophoresis and other standard molecular biology techniques, Recombinant Protein production, purification and characterization, SDS-page & Western blotting.

Generation of iPSCs & isogenic cell models via genome editing, Genome Editing (CRISPR, Prime Editing, rAAV, & ZFNs), Cell culture, Cell Transfection & Transduction, Cell proliferation & migration assays, Anchorage independent growth, RNAi, Ectopic gene expression and viral vectors, Luciferase assays, High content drug screening, Drug dose response (IC50) via MTT assays, FACS based cellular analyses (Cell sorting, Cell cycle and apoptosis), Microscopy, Immunohistochemistry, Sample preparation for cellular metabolome analysis.

Bioinformatics:

R and python, **NGS** data Analysis, Protein Structure modelling, Molecular Docking, Molecular Dynamic Simulations

Languages and Communication

English, Urdu, Swedish (intermediate level)

Highly experienced in scientific writing and oral presentation

Selected Publications

1. Gul, S., Ali2, M. A. & Khan, M. Brevilin A Binds with Neh1 Domain of NRF2 and Inhibits its Translocation into Nucleus in Cancer Cells. *Pakistan Journal of Zoology* (2024).
2. Wang, T. *et al.* Vaginal microbiota are associated with in vitro fertilization during female infertility. *iMeta* (2024)

1. Rehman, H. M. Sajjad M., **Ali M. A.**, *et al.* Identification of NS2B-NS3 Protease Inhibitors for Therapeutic Application in ZIKV Infection: A Pharmacophore-Based High-Throughput Virtual Screening and MD Simulations Approaches. *Nato Adv Sci Inst Se* **11**, 131 (2023).
2. Rehman, H. M. Sajjad M., **Ali M. A.**, *et al.* Identification of RdRp inhibitors against SARS-CoV-2 through E-pharmacophore-based virtual screening, molecular docking and MD simulations approaches. *Int J Biol Macromol* 124169 (2023) doi:10.1016/j.ijbiomac.2023.124169.
3. Murugan, N. A. Javali P. S., Pandianb C. J., **Ali M. A.**, *et al.* Computational investigation of the increased virulence and pathogenesis of SARS-CoV-2 lineage B.1.1.7. *Phys Chem Chem Phys* **24**, 20371–20380 (2022)
4. **Ali, M. A.** et al. (2021) Common and mutation specific phenotypes of KRAS and BRAF mutations in colorectal cancer cells revealed by integrative -omics analysis. J Exp Clin Canc Res 40, 225 (2021)
5. Fatima, A. Hoeber J, Schuster J, Koshimizu E, Maya-Gonzalez C, Keren B, Mignot C, Akram T, Ali Z, Miyatake S, Tanigawa J, Koike T, Kato M, Murakami Y, Abdullah U, **Ali M. A.**, et al. Mono-allelic and bi-allelic variants in NCDN cause neurodevelopmental delay, intellectual disability, and epilepsy. Am J Hum Genetics (2021)
6. Larsson, C., **Ali, M. A.,** *et al.* Loss of DIP2C in RKO cells stimulates changes in DNA methylation and epithelial-mesenchymal transition. *BMC Cancer* **17**, 487 (2017)
7. **Ali, M. A.** *et al*. Transcriptional modulator ZBED6 affects cell cycle and growth of human colorectal cancer cells. Proceedings of the National Academy of Sciences 201509193 (2015)
8. **Ali, M. A.**, *et al*. Computational and molecular tools for scalable rAAV-mediated genome editing. Nucleic Acids Res. 43, e30 (2015)
9. Kiflemariam S.,* Mignardi M.,* **Ali, M. A.,** *et al*. In situ sequencing identifies TMPRSS2-ERG fusion transcripts, somatic mutations and gene expression in prostate cancers. The Journal of pathology 234, 253-261 (2014).
10. Kundu, S. **Ali, M. A.,** et al. Linking FOXO3, NCOA3, and TCF7L2 to Ras pathway phenotypes through a genome-wide forward genetic screen in human colorectal cancer cells. Genome Medicine 10, 2 (2018)
11. Pandzic, T. D., Larsson, J., Ban, K., Kundu, S., **Ali, M. A.** *et al*. Transposon mutagenesis reveals fludarabine-resistance mechanisms in chronic lymphocytic leukemia. Clinical Cancer Research 22, 6217–6227 (2016)
12. **Ali, M. A.** & Sjöblom, T. Molecular pathways in tumor progression: from discovery to functional understanding. *Molecular BioSystems* **5**, 902–908 (2009)

References

Will be provided on request!