

MUHAMMAD AKRAM

MOLECULAR BIOLOGIST | BIOTECHNOLOGIST

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PROFESSIONAL PROFILE

Genetic Engineering and Molecular Cloning: Design, perform, and optimize gene cloning, expression, and vector construction for various recombinant proteins and therapeutic molecules.

Protein Expression and Purification: Conduct recombinant protein production in bacterial, mammalian, or yeast systems, followed by downstream processing and purification to obtain high-purity proteins for research or therapeutic applications.

Biochemical and Biophysical Analysis: Characterize proteins and nucleic acids using advanced techniques such as SDS-PAGE, Western blotting, ELISA, HPLC, and spectrophotometry to ensure functionality and quality.

Drug Delivery and Biomarker Research: Explore and utilize innovative platforms such as exosomes, nanoparticles, or PEGylation to enhance therapeutic delivery, stability, and efficacy.

Cell Culture and Functional Assays: Maintain and manipulate mammalian and cancer cell lines for transfection, protein expression studies, and functional assays to validate biological activity.

Genomic and Transcriptomic Analysis: Perform PCR, qPCR, for gene expression analysis and biomarker discovery.

Collaborative Research and Development: Work closely with multidisciplinary teams to develop biosimilar, therapeutic proteins, and diagnostic tools that meet industrial and clinical needs.

Mentorship and Knowledge Sharing: Mentor PhD scholars, M.Phil(MS) scholars, junior researchers, graduate students, and technical staff to foster skill development and promote a collaborative learning environment.

Regulatory Compliance and Documentation: Ensure laboratory practices comply with ISO standards and regulatory guidelines, including maintaining thorough documentation for audits and certifications.

EDUCATION

Ph.D. in Molecular Biology (2025)

Centre of Excellence in Molecular Biology (CEMB), University of the Punjab, Lahore, Pakistan

M.Phil. Molecular Biology and Forensic Science

Centre for Applied Molecular Biology, University of the Punjab, Lahore, Pakistan.

ACADEMIC POSITIONS

Assistant Professor and Incharg, Mammalian Cell Culture Lab (2025 – Present)

Centre for Applied Molecular Biology, University of the Punjab, Lahore.

Program Coordinator, BS Audiology (2025-Present)

Department of Allied Health Sciences, University of the Punjab, Lahore.

Research Officer (2008-2025)

Centre for Applied Molecular Biology, University of the Punjab, Lahore.

RESEARCH GRANTS

- **Principal investigator** of the project **Association of CD14 gene variants with asthma in Pakistani Population** as **Principal Investigator** funded by University of the Punjab in 2015.
- **Principal investigator** of the project **Development and Characterization of Interleukin-21/Anti-cancer peptides fusion proteins to enhance their anti-cancer potential** funded by the University of the Punjab in 2023.
- **Principal investigator** of the project **In Silico and In Vitro Characterization of IL-37–Peptide Fusion Constructs as Anticancer Agents** funded by the University of the Punjab in 2025.

PROJECTS

- Worked as a **QC Manager** on the project **Indigenous low-cost production of UltraPure Taq Polymerase/reverse transcriptase and PCR Mix for COVID-19 clinical diagnostic Kit** funded by PSF in 2020
- Worked as a **Research Associate** in the project **Development of human recombinant interleukin-11 (Oprelvekin Biosimilar)** funded by HEC in 2018

PUBLICATIONS

- **M. Akram**, N. A. Fujimura, S. Tahir, R. Abbas, M. A. Khan, K. Malik, N. Ahmed (2024). “Synergistic anticancer effects of interleukin-21 combined with therapeutic peptides in multiple cancer cells”. *Biotechnology Letters*, <https://doi.org/10.1007/s10529-024-03544-6>.
- Abbas, Z., Afzal, S., Fujimura, N. A., **Akram, M.**, Tahir, S., Malik, K., & Ahmed, N., (2024). Recombinant expression, downstream optimization, and therapeutic evaluation of recombinant human interleukin-37 for cancer therapy. *Biotechnology Letters*. <https://doi.org/10.1007/s10529-024-03539-3>
- Ahmed, A., Fujimura, N. A., Tahir, S., **Akram, M.**, Abbas, Z., Riaz, M., Raza, A., Abbas, R., & Ahmed, N., (2024). Soluble and insoluble expression of recombinant human interleukin-2 protein using pET expression vector in *Escherichia coli*. *Preparative Biochemistry and Biotechnology*, 1-13. <https://doi.org/10.1080/10826068.2024.2361146>
- Huda Shuaib, Muhammad Zafar Saleem, Mohammad Yahya Alshahrani, Muath Suliman, Umme Hani, Tariq Nadeem, Saad Tahir, **Muhammad Akram**, Onaiza Samreen, Hamid Bashir (2024). “Development and Bioactivity Assessment of a Recombinant Pseudomonas aeruginosa Azurin-BR2 Peptide Fusion Protein: A Novel Approach to Cancer Immunotherapy”. *J. Biol. Regul. Homeost. Agents*. 38(7): 5573–5581 <https://doi.org/10.23812/j.biol.regul.homeost.agents.20243807.448>.
- Rafi, N., Abbas, R., Ahmed, N., Tahir, S., **Akram, M.**, Khan, M. A., Fujimura, N. A., Shafique, M., & Malik, K., (2024). Corn Steep Liquor as an Auto-Induction Medium for the Production of rhIFN- β -1b Protein in *Escherichia coli*. *Iranian Journal of Science*, 48(5), 1087-1098. <https://doi.org/10.1007/s40995-024-01684-y>
- Rahman, Z. U., Ahmed, N., Fazal, N., Khan, M. I., Khan, M. A., Tahir, S., **Akram, M.**, Ullah, S., & Zafar, A. U. (2023). Enhancing the Expression and Purification of IL-29: A study of autoinduction and one-step Purification Methods. *Advancements in Life Sciences*, 10(1), 122-128. <http://www.als-journal.com/proonlinefirst-1730/>
- Fujimura, N. A., Fatima, S. E., Ahmed, N., **Akram, M.**, Tahir, S., Khan, M. A., Amirzada, I., Nadeem, T., Bashir, H., & Malik, K. (2023). Evaluation of exosomes encapsulated recombinant Interleukin-29 for its in vitro anticancer studies. *Journal of Biotechnology*, 373, 24-33. <https://doi.org/https://doi.org/10.1016/j.jbiotec.2023.06.008>
- Munir, A., Ahmed, N., **Akram, M.**, Fujimura, N. A., Tahir, S., & Malik, K. (2023). Enhanced soluble expression of active recombinant human interleukin-29 using champion pET SUMO system. *Biotechnology Letters*. <https://doi.org/10.1007/s10529-023-03402-x>
- Muhammad Farooq Sabar, Muhammad Usman Ghani, Abeera Farooq, Sana Ashiq, **Muhammad Akram** & Farheena Iqbal Awan. (2023). “A comprehensive review on asthma: pathophysiology, treatment and role of genetics”. *International Journal of Pharmacy & Integrated Health Sciences*, 4(2), DOI: <https://doi.org/10.56536/ijpihs.v4i2.103>
- **M Akram**, MF Sabar, I Bano, MU Ghani, M Shahid, (2022). Single nucleotide polymorphisms of transforming growth factor- β 1 gene as potential asthma susceptible variants in Punjabi population of Pakistan. *J Ayub Med Coll Abbottabad* 34(4 Suppl 1): 944–8. <https://DOI.10.55519/JAMC-04-S4-10495>.
- Tahir, S., Ahmed, N., Khan, M. A., **Akram, M.**, Abbas, R., & Malik, K. (2022). Production of Stable Serum Albumin Fused Streptokinase in *Pichia pastoris*. *Pakistan Journal of Zoology*, 1-9. DOI: <https://dx.doi.org/10.17582/journal.pjz/20220426080426>.
- M.U. Ghani, M.F. Sabar, M. Shahid, **M. Akram**, B. Anwar, M.B. Anwar “SNP variants of IL-27 gene as genomic predictors against effectiveness of Vitamin D therapy in COPD patients” *CHEST Journal*, (2021) Volume 160, Issue 4, Supplementary Page A1453, DOI: <https://doi.org/10.1016/j.chest.2021.07.1329>.

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- Muhammad Usman Ghani, Muhammad Farooq Sabar, **Muhammad Akram** "Smart Approach for Cost Effective Genotyping of Single Nucleotide Polymorphism' Kuwait Journal of Science (2021). <https://doi.org/10.48129/kjs.v48i2.8957>.
 - Nadeem Ahmed, Bakht Afroze, Rabia Abbas, Mohsin Ahmed Khan, **Muhammad Akram**, Saad Tahir, Shehman Bakht, Ayesha Munir, Ahmad Ali Shahid, "Method for efficient soluble expression and purification of recombinant human interleukin-15" Protein Expression and Purification (2021). <https://doi.org/10.1016/j.pep.2020.105746>.
 - **M. Akram** "Association of TGF- β 1 gene polymorphism with asthma in Pakistani population" CHEST Journal, June 2020 Volume 157, Issue 6, Supplement, Page A212, DOI: <https://doi.org/10.1016/j.chest.2020.05.238>.
 - Fakiha Aslam, Nadeem Ahmed, Mohsin Ahmad Khan, Farhana Azam, **Muhammad Akram**, Saad Tahir, and Ahmad Usman Zafar "Evaluating the ion exchange chromatography for matrix-assisted PEGylation and purification of consensus interferon" Biotechnol Appl Biochem (2019). <https://doi.org/10.1002/bab.1832>.
 - Muhammad U. Ghani, Muhammad F. Sabar, Iqbal Bano, Mariam Shahid, **Muhammad Akram**, Ifrah Khalid, Alishba Maryam, Muhammad U. Khan. "Evaluation of ADAM33 gene's single nucleotide polymorphism variants against asthma and the unique pattern of inheritance in Northern and Central Punjab, Pakistan" Saudi Med J 2019; Vol. 40 (8). <https://DOI.10.15537/smj.2019.8.24411>.
 - M.U. Ghani, M.F. Sabar, I. Bano Dr., M. Shahid, **M. Akram**, I. Khalid, A. Maryam, M.U. Khan "Inheritance pattern of rs2280089, rs2280090, rs2280091 snp variants in Punjabi population and association with asthma disease" (CHEST Journal, April 2019 Volume 155, Issue 4, Supplement, Page 168A. <https://DOI.10.1016/j.chest.2019.02.162>.
 - Rukhsana Perveen, Ahmad Ali Shahid, Muhammad Shafique, Muhammad Shehzad, **Muhammad Akram**, "Kashmiris phylogenetic depictions through uniparental and biparental genetic markers", International Journal of Legal Medicine (2019) 134:1311-1312, <https://doi.org/10.1007/s00414-019-02082-5>.
 - Muhammad Farooq Sabar, **Muhammad Akram**, Farheena Iqbal Awan, Muhammad Usman Ghani, Mariam Shahid, Zafar Iqbal, Samra Kousar, Muhammad Idrees, "Awareness of Asthma Genetics in Pakistan: A Review with Some Recommendations" Adv. life sci., vol. 6, no. 1, pp. 1-10, November 2018
 - 21. Muhammad Farooq Sabar, Mariam Shahid, Iqbal Bano, Muhammad Usman Ghani, **Muhammad Akram**, Farheena Iqbal, Samra Kousar, Zafar Iqbal, Saba Altaf & Tayyab Husnain, "rs12603332 is associated with male asthma patients specifically in urban areas of Lahore, Pakistan", Journal of Asthma (2017), 54:9, 887-892 <http://dx.doi.org/10.1080/02770903.2016.1277539>.
 - Muhammad Usman Ghani, Muhammad Farooq Sabar, Mariam Shahid, Farheena Iqbal Awan, Muhammad Akram, "A report on asthma genetics studies in Pakistani population", Advancements in Life Sciences (2017), Feb;4(2):33-38. ISSN 2310-5380.
 - Muhammad Farooq Sabar, Muhammad Usman Ghani, Mariam Shahid, Aleena Sumrin, Amjad Ali, **Muhammad Akram**, Muhammad Akram Tariq & Iqbal Bano: "Genetic variants of ADAM33 are associated with asthma susceptibility in the Punjabi population of Pakistan", Journal of Asthma (2016), DOI: <https://doi.org/10.3109/02770903.2015.1124441>.
 - 24. Ahmed, N., H. Bashir, A. U. Zafar, M. A. Khan, S. Tahir, F. Khan, M. I. Khan, **M. Akram** and T. Husnain. "Optimization of conditions for high-level expression and purification of human recombinant consensus interferon (rh-cIFN) and its characterization." Biotechnol Appl Biochem (2015) Sep;62(5):699-708. <https://doi.org/10.1002/bab.1320>. Epub 2015 Jan 30.
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