



DR. IRSHAD AHMAD

Current Position: Associate Professor (BPS-20)
Department of Molecular Biology & Genetics
Institute of Basic Medical Sciences
Khyber Medical University, Peshawar, Pakistan

Nationality: Pakistan

Education:

2013-2017: PhD Molecular Biology
School of Biomedical Sciences
University of Leeds, United Kingdom

2002-2004: M.Phil Biotechnology
University of Peshawar, Pakistan

Experience:

Doctoral researcher, School of Biomedical Sciences, University of Leeds,
United Kingdom (2013-2017)

PhD research project:

- Leverhulme Trust (UK) and Australian NHMRC-funded PhD with Professor Peter Henderson in the School of Biomedical Sciences investigating the molecular mechanisms of membrane transport proteins of the NCS1 and PACE families
- The NCS1 family proteins are bacterial structural homologues of human transporters having important roles in depression, diabetes and cancer whereas PACE family transporters are multidrug resistant proteins
- I cloned and mutate these families proteins and combined their functional data with structural informations in order to explore the ligand binding and molecular transport mechanism.

Current address:



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Khyber Medical University,
Peshawar, Pakistan



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Employment and Work history:

July 14, 2025 till date

Associate Professor in Molecular Biology & Genetics (permanent)

Khyber Medical University, Peshawar, Pakistan

May 02, 2019 till July 13, 2025

Assistant Professor in Molecular Biology & Genetics (permanent)

Khyber Medical University, Peshawar, Pakistan

January 30, 2018 till January 29, 2019

Assistant Professor in Molecular Biology & Genetics (IPFP contract)

Khyber Medical University, Peshawar, Pakistan

October 1, 2013 till September 30, 2017

PhD Scholar in School of Biomedical Sciences

University of Leeds, United Kingdom

August 17, 2004 till February 28, 2013

Research Officer (BPS-17 Permanent)

Centre of Microbiology & Biotechnology

VRI, Peshawar, Pakistan

PhD Program Coordinator since November 2020 till date:

- Overseeing the scheduling of exams, including setting dates, arranging venues, and coordinating invigilation.
- Managing all aspects of the PhD program, including admissions, curriculum development, and student support.
- Providing guidance and support to prospective and current PhD students, including answering inquiries, assisting with admissions processes and offering advice on academic and administrative matters.
- Monitoring and evaluating the quality of the PhD program and maintaining the program's policies and procedures in accordance with institutional and accreditation standards.

Short training/Workshops attended

- Attended the: Annual Conference of Microbiology Society at ACC, Liverpool, UK from 21-24 March, 2016.
- Completed the UK Circular Dichroism Summer School held at The University of Warwick from 7th – 9th July, 2014.
- Practical training on Molecular detection and genotyping of HBV/HCV PCR methods and quality assurance issues from National Institute of Biotechnology and Genetic Engineering (NIBGE), Faisalabad Pakistan 20-24 December 2004.
- Cultivation and Maintenance of Baby Hamster Kidney Cell Line (HBK-21) from Department of Microbiology, University of Veterinary and Animal Science, Lahore, Pakistan 16-21 May 2005.
- Computer Elementary Training Course offered by Pakistan Computer Bureau Islamabad, Pakistan March 21- April 23, 2005.
- Employment creation in rural areas from Pakistan Academy for Rural Development, Peshawar Pakistan April 25-27, 2005
- National Training Course on Biotechnological Techniques from Institute of Biotechnology and Genetic Engineering (IBGE), NWFP Agricultural University Peshawar Pakistan 12-17 September 2005.

Books

- Protein Secretion Systems of Gram Negative Bacteria (ISBN: 978-620-0-44384-7)
- A Closer Look at Membrane Proteins (ISBN: 978-1-83853-535-3)
- Molecular Blueprints of Microbes (ISBN: 978-627-7833-00-8)

Books Chapters

- Structure, Substrate Recognition, and Mechanism of the Na⁺-Hydantoin Membrane Transport Protein, Mhp1
- Membrane Transport Proteins: The Nucleobase-Cation-Symport-1 Family
- Cloning, amplified expression, functional characterisation and purification of *Vibrio parahaemolyticus* NCS1 cytosine transporter VPA1242

Projects

- Development and Thermostability assessment of recombinant vaccine against local isolates of New Castle Disease funded by Pakistan Science Foundation (7.19 million Inprogress)
- Comparative genetic analysis of antibiotic-resistant genes in zoonotic *E. coli* isolated from humans and animals setting funded by ORIC, Khyber Medical University Peshawar. (0.5 million completed)
- Molecular characterization of multidrug resistant zoonotic *Escherichia coli* isolates from dairy milk funded by Higher Education Commission of Pakistan (0.460 million completed).

Research Publications

- Muhammad Tariq Zeb, Elise Dumont, Muhammad Tahir Khan, Aroosa Shehzadi and **Irshad Ahmad**.* Multi-Epitopic Peptide Vaccine Against Newcastle Disease Virus: Molecular Dynamics Simulation and Experimental Validation.(2025) Vaccines. DOI.org/10.3390/vaccines12111250
- Muhammad Tariq Zeb, **Irshad Ahmad***, Muhammad Tahir Khan, Muhammad Tahir Sarwar and Nighat Nawaz. Insights into NDV Distribution and Molecular Detection Across Multiple Regions of KhyberPakhtunkhwa Province, Pakistan. Pakistan Veterinary Journal. DOI: 10.29261/pakvetj/2024.156
- Fazal Shan, Ahmad Al Abad, Majid Ullah, Nighat Nawaz, Mihk Ikram, **Irshad Ahmad**. In-silico structural and functional annotation of fcgr2a in association with Rheumatoid arthritis and identification of novel therapeutic targets. (2023). Pak-Euro Journal of Medical and Life Sciences. DOI: 10.31580/pjmls.v6i4.3011
- Muhammad Tahir Khan, Taj Ali Khan, **Irshad Ahmad**, Shabbir Muhammad, Dong-Qing Wei. Diversity and novel mutations in membrane transporters of Mycobacterium tuberculosis. (2022). Briefings in Functional Genomics. DOI: 10.1093/bfpg/elac018.
- **Irshad Ahmad**, Youri Lee, Nighat Nawaz, Rizwan Elahi, Israr Ali Khan, Muhammad Zahid Mustafa, Simon G. Patching. Cloning, Amplified Expression and Bioinformatics Analysis of a Putative Nucleobase Cation Symporter-1 (NCS-1) Protein From *Rhodococcus erythropolis*. (2021). BioScientific Review. DOI.org/10.32350/BSR.0304.05
- **Irshad Ahmad**, Sonia Khattak, Roshan Ali, Nighat Nawaz, Kalim Ullah, Sher Bahadar Khan, Mumtaz Ali, Simon G. Patching, Mohammad Zahid Mustafa. Prevalence and molecular characterization of multidrug-resistant *Escherichia coli* O157: H7 from dairy milk in the Peshawar region of Pakistan. (2021). Journal of Food Safety DOI.org/10.1111/jfs.12941
- Muhammad Asim, Ihsan Ullah, Asif Ali, Muhammad Ilyas, Mushtaq Ahmad, **Irshad Ahmad**, Yasar Mahmood Yousafzai, Sufyan Zafar, Zia Ullah Shah. Bacterial contamination in multivitamin syrups. (2021) Journal of Postgraduate Medical Institute <https://jpmi.org.pk/index.php/jpmi/article/view/2509>
- Nighat Nawaz, **Irshad Ahmad**, Simon G. Patching, Iqbal Hussain. Green synthesis of gold nanoparticles using Tribulus terrestris extract and antibacterial activity against Gram negative bacteria.(2021). BioMedical Letter. doi.org/10.47262/BL/7.2.20210617

- Farhat Rehman, Mohsin Shah, Asif Ali, **Irshad Ahmad**, Muhammad Tahir Sarwar, Agnese Maria Chiara Rapisarda & Antonio Cianci. Unpasteurised milk consumption as a potential risk factor for toxoplasmosis in females with recurrent pregnancy loss. (2020) Journal of Obstetrics and Gynaecology. doi.org/10.1080/01443615.2019.1702630
- Roshan Ali, Yuannian Jiao, P Kerr Wall, Simon G Patching, **Irshad Ahmad**, Ghosia Lutfulla, Claude W dePamphilis . In silico identification and structure function analysis of a putative coclaurine N-methyltransferase from Aristolochia fimbriata. (2020). Computational Biology and Chemistry. DOI: 10.1016/j.compbiolchem.2020.107201
- Zunera Tanveer, **Irshad Ahmad**, Muhammad Shahid Javed, Shoaib Ahmad Malik, Nargis Haider Kakar, Mushtaq Ahmad, Simon G. Patching, Muhammad Naeem, Mohammad Zahid Mustafa. Screening for hepatitis b and c viral infections among pregnant women attending the bolan medical complex hospital and sandeman provincial civil hospital Quetta, Pakistan. (2020). The Professional Medical Journal. doi.org/10.29309/TPMJ/2020.27.08.3129
- Sami Ullah, Farid Ullah Shah, Muhammad Irshad Khan, Asif Ali, Mushtaq Ahmad, Mushtaq Ahmad, **Irshad Ahmad**, Yasar Mehmood Yousafzai, Kinza Ayaz. Screening for neonatal sepsis by determination of c-reactive protein at a paediatric a ward LRH Hospital in Peshawar, Pakistan. (2019). Advances in Basic Medical Sciences.
- Muhammad Shafee, Ferhat Abbas, Zunera Tanveer, Andrew Whitelaw, Lemese Ah Tow, Muhammad Ashraf, **Irshad Ahmad**, Simon G Patching, Abdul Jabbar, Ali Akbar, Mohammad Zahid Mustafa. Predominance of central Asian strain(ST 260) in mycobacterium tuberculosis isolates from Balochistan by spoligotyping. (2019). Journal of Infection in Developing Countries. DOI: 10.3855/jidc.10803
- Zil-e-Huma, Abdul Malik Tareen, Kaleem Ullah, Tauseef M Asmat, Abdul Samad, Asim Iqbal, Mohammad Zahid Mustafa, **Irshad Ahmad** and Sadeeq ur Rahman. Incidence of Diarrheagenic Escherichia coli Pathotypes in Children Suffering from Diarrhea in Tertiary Care Hospitals, Quetta, Pakistan. (2019). Pakistan Journal of Zoology. DOI: http://dx.doi.org/10.17582/journal.pjz/2019.51.6.2015.2021
- Altaf A. Mangi, Haroon Khan, Barkat Ali Shaikh, **Irshad Ahmad**, Muhammad Kamal Shah, Waseem Abbas Malhani, Nadeem Lund, Muhammad Asif Shahzad, Eshwa Dar, & Shumaila Parveen. Interventional role of pharmacist to uplift the quality of life of patient suffering from cardiovascular disease at tertiary care hospital of Larkana. (2019). Latin American Journal of Pharmacy.
- Farhan Anwar Khan, Xi Chen, Muhammad Shoaib, Muqadar Shah, Faisal Ahmad, Hayatullah Khan, Faiz Ur Rehman, Muhammad Saeed, Ijaz Ahmad, **Irshad Ahmad**, Aizhen Guo. Two dimensional gel electrophoresis (2 DE) for high throughput proteome analyses of Mycoplasma bovis. (2019). Acta Biochimica Polonica. Doi: 10.18388/abp.2019_2794.
- Shafqat Husnain Khan, Shah Jahan, **Irshad Ahmad**, Sadeeq ur Rahman, and Tayyab ur Rehman. Incidence of blaIMP and blaVIM genes among Carbapenemase producing E.coli in Lahore, Pakistan. (2019). Pakistan Journal of Zoology. DOI: http://dx.doi.org/10.17582/journal.pjz/2019.51.5.sc1
- Sher Bahadar Khan, Zou Geng, Cheng Yu-ting, Asad Sultan, Mumtaz Ali, **Irshad Ahmad** and Rui Zhou. Distribution of phenotypic and genotypic antibiotic resistance in Escherichia coli isolates along the production and supply chain of pork around Hubei Province of China. (2019). Pakistan Journal of Zoology. DOI: http://dx.doi.org/10.17582/journal.pjz/ 2019.51.4.1569.1574
- Karl A. Hassan, Varsha Naidu , Jacob R. Edgerton , Karla A. Mettrick , Qi Liu , Leila Fahmy , Liping Li , Scott M. Jackson , **Irshad Ahmad**, David Sharples , Peter J. F. Henderson and Ian T. Paulsen. Short chain diamines are the physiological substrates of PACE family efflux pumps. (2019). Proceedings of the National Academy of Sciences doi.org/10.1073/pnas.190159111

- **Irshad Ahmad**, Sher Bahadar Khan , Nighat Nawaz , Mohammad Zahid Mustafa, Asadullah , Mutiullah Khattak , Momin Khan , Asif Ali , Yasar Mehmood Yousafzai , Sadeeq ur Rehman and Chris Thompson. Purification and secondary structure analysis of major facilitator superfamily transport protein gab15256 from *Arthrobacter globiformis*. (2019). *Int.J.Biol.Biotech*.
- Sher Bahadar Khan, Geng Zou, Ran Xiao, Yuting Cheng, Zia Ur Rehman, Sher Ali, Atta Muhammad Memon, Shah Fahad, **Irshad Ahmad**, Rui Zhou. Prevalance, quantification and isolation of pathogenic Shiga toxin *Escherichia coli* 0157:H7 along the production and supply chain of pork around Hubei Province of China. (2018). *Microbial Pathogenesis*. DOI: 10.1016/j.micpath.2017.12.019
- Abdul Samad, Ferhat Abbas, Zafar Ahmad, ZuneraTanveer, **Irshad Ahmad**, Simon G. Patching, Nighat Nawaz, Muhammad Tauseef Asmat, Abdul Raziq, Asadullah, Muhammad Naeem, Muhammad Aleem Akhtar, Olena Pokryshko, Mohammad Zahid Mustafa. Multiplex polymerase chain reaction detection of Shiga toxin genes and antibiotic sensitivity of *Escherichia coli* 0157:H7 isolated from beef meet in Quetta, Pakistan. (2018) *Journal of Food Safety*. Doi.org/10.1111/jfs.12540
- Sadeeq ur Rahman, Shakoore Ahmad, Hamayun Khan, Muhammad Akbar Shahid, **Irshad Ahmad**. Expression and Analysis of two partener secretion system of *Neisseria meningitidis* using heterologous host *Escherichia coli*. (2018) *Int J Agric Biol*; DOI:10.17957/IJAB/15.0738
- Karl A. Hassan, Qi Liu, Liam D. H. Elbourne, **Irshad Ahmad**, David Sharples, Varsha Naidu, Chak Lam Chan, Liping Li, Steven P.D. Harborne, Alaska Pokhrel, Vincent L. G. Postis, Adrian Glodman, Peter J. F. Henderson, Ian T. Paulsen. Pacing across the membrane: the novel PACE family of efflux pumps is widespread in Gram-negative pathogens. (2018) *Res Microbiol* DOI: 10.1016/j.resmic.2018.01.001
- Abdul Samad, Ferhat Abbas, ZuneraTanveer, Zafar Ahmad, **Irshad Ahmad**, Simon G. Patching, Nighat Nawaz, Muhammad TauseefAsmat, Abdul Raziq, Asasullah, Irfan Shahzad Sheikh, Muhammad Naeem, Olena Pokryshko, Mohammad Zahid Mustafa. Prevalence of *Salmonella* spp. in chicken meat from Quetta retail outlets and typing through multiplex PCR. *Romanian Biotechnological Letters* (2018) DOI: 10.26327/RBL2018.210
- Irfan Khattak, Muhammad Hassan Mushtaq, Sultan Ayaz, Sajid Ali, Anwar Sheed, Javed Muhammad, Muhammad Luqman Sohail, Haq Amanullah, **Irshad Ahmad**, Sadeeq ur Rahman. Incidence and Drug Resistance of Zoonotic *Mycobacterium bovis* Infection in Peshawar. (2018) *Advances in Experimental Medicine and Biology*. DOI: 10.1007/5584_2018_170
- Massoud Saidijam , Saeid Afshar , **Irshad Ahmad**, Simon G. Patching. Nucleoside transporters in PET imaging of proliferating cancer cells using 3'-deoxy-3'-[18F]fluoro-L-thymidine. (2018) *Journal of Diagnostic Imaging in Therapy*. Doi.org/10.17229/jdit.2018-0210-030
- **Irshad Ahmad**, Nighat Nawaz, Sadeeq Ur Rahman, Abdul Sajid, Farhan A Khan, et al.. Multifaceted roles of efflux proteins in prokaryotes. (2018) *Asian Journal of Biological and Life Sciences, Pharmaceutical and Biological Society*.
- **Irshad Ahmad**, Nighat Nawaz, Nizam M. Darwesh, Sadeeq ur Rahman, Mohammad Z. Mustafa, Sher B. Khan, Simon G. Patching. Overcoming challenges for amplified expression of recombinant proteins using *Escherichia coli*. (2017) *Proteins Expression & Purification*. Doi.org/10.1016/j.pep.2017.11.005