Department of Biological and Biomedical Sciences

Newsletter

Chair's Message

In previous BBS newsletters and other communications, we have shared information about the department's strategic plan set in 2019, and one of its major targets - the renovation of the Multidisciplinary (MDL) and Microscopy Laboratories (ML).

As we head towards the second half of 2024, it gives me great pleasure to share that the newly renovated MDL and ML are up and running. If you haven't seen the spaces yet, stop by. We would love to show the AKU community what we have achieved. The new labs are perfectly designed for the world-class teaching, training and cutting-edge research that we are all proud to be part of. And in this blazing heat and humidity, it doesn't hurt to have a walk-in -20 degree freezer, but for a visit to that, we may just charge!

Importantly, we've met the majority of goals from our strategic plan set five years ago and are now in the process of finalizing the direction for BBS over the next five years. This achievement reflects the dedication and hard work of all our department members and indeed, the entire AKU community. It's a testament to this ethos and the guiding principles of IQRA that together, we consistently deliver not only on our day-to-day tasks with excellence, but also our long-term goals.

With that, I invite you to peruse our summer newsletter, and look forward to your feedback and comments.

Thank you,
Kulsoom

FROM THE HUB

Dr Pervaiz Iqbal gave a talk on 'Lead Pollution and its Effects on Human Health' at the inaugural ceremony of the launch of Aga Khan University Emeritus Professors at Aga Khan University on February 7, 2024.

Dr Iqbal also gave a talk at the Nepal Academy of Sciences in a workshop titled 'Connecting Dots between Climate Change Health and Equity: A Hybrid Workshop' at Kathmandu, Nepal, on March 14, 2024.

Dr Syeda Sadia Fatima was invited to a webinar to give a talk on 'The Neuro-Epigenetic Connection: Signals of Change in Health, Obesity, and Beyond' at the Sixth Regional Webinar of the South Asian Association of Physiology on February 29, 2024.

Dr Najeeha Iqbal conducted a PI-intensive workshop on April 16, 2024, as part of a training offered by the Research Office.

WORKSHOPS

Dr Kulsoom Ghias, Dr Satwat Hashmi and Dr Sadia Fatima attended and delivered a workshop, ‘Leveraging AI for Student-Faculty Partnerships for Enhanced Learning’ at the AsiaPacific Medical Education Conference in Colombo, Sri Lanka, from January 15-21, 2024.

Dr Sadia Fatima was invited to deliver a workshop, ‘Next Generation Research: Exploring AI and its Use in Basic and Clinical Research’ at the International Conference on Health Research at the Rehman Medical Institute in Peshawar on April 25, 2024. Dr Fatima also moderated a plenary session at the conference, ‘Navigating Health Research Transition: Current Challenges and Prospectus’.

Dr Muhammad Zuhair Yusuf facilitated a workshop arranged by the Quality of Teaching and Learning Network titled ‘Re-thinking Teaching’ at the Karakorum International University in Gilgit in April 2024.

ACHIEVEMENTS

Dr Rehana Rehman was awarded:

- First prize for her poster presentation, Exploring New Frontiers in Education: Evidence from Research, at AKU's Sixth Educational Research Day on April 18, 2024.
- Fellowship of the International Union of Physiological Sciences Academy.

Dr Rehman also served as a judge in the Sixth Department of Educational Development Educational Grand Rounds.

Dr Pervaiz Iqbal was appointed as the Vice Chairman of Aga Khan University Emeritus Professors.

Dr Sadia Fatima was awarded Senior Fellow of the Higher Education Academy

ACHIEVEMENTS

Dr Ambrin Fatima was invited to present her abstracts at the European Human Genetics Conference (EHGC) held in Berlin, Germany, from June 1-4, 2024:

- Iqbal Z, Mian BA, Khalid LB, Ali A, Raza M, Toft M, Fatima A, Stewart G. A homozygous stop variant in *DDIAS* is a plausible cause of a disease in a boy, presenting with global developmental delay, microcephaly, generalized clonic seizures and spasticity.

- Zafar G, Khalid LB, Ali Z, Hashmi SN, Toft M, Iqbal Z, Fatima A. YAF2. A novel candidate gene implicated in autosomal recessive non-syndromic intellectual disability.

- Fatima A, Mian BA, Khalid LB, Ali FB, Zahra H, Ali A, Toft M, Iqbal Z. Homozygous missense variant in DMRTA2 causes colpocephaly with associated agenesis.

- Khalid LB, Mian BA, Ali A, Shahid M, Toft M, Iqbal Z, Fatima A. Rab11-binding protein RELCH/KIAA1468 is a potential candidate gene for global developmental delay, Intellectual disability with microcephaly and seizures.

- Zahra H, Zafar G, Khan HN, Khalid LB, Mahmud O, Baig SM, Toft M, Iqbal Z, Fatima A. A homozygous missense variant in *COL12A1* causes Ullrich congenital muscular dystrophy 2 in a consanguineous family.

Additionally, Dr Ambrin served as a reviewer for the conference abstracts and as a member of the editorial board of the European Journal of Human Genetics.

Dr Ambrin's MPhil in Biological and Biomedical Sciences student, Hijab Zahra, attended the conference with her after receiving a prestigious fellowship from the ESHG. At the conference, Hijab was given the opportunity to present her MPhil research, which focuses on the genetic variation in the COL12A1 gene.

LAB OPENING

This year, the department unveiled its new state-of-the-art Multidisciplinary and Microscopy (MDL and ML) laboratories.

The revamped labs provide unparalleled opportunities for innovative teaching methodologies, leveraging the latest IT tools to enrich the learning experience like never before. From multidisciplinary science training to world-class research endeavors focused on regionally relevant diseases, these labs offer a dynamic platform for exploration and discovery. MDL, now accommodating up to 75 students at one time, features adaptable furniture and ample storage space for equipment and consumables. The addition of core facilities enhances academic activities, while designated office and breakout areas promote interaction among staff, students, and faculty. ML, with a capacity for 100 students, seamlessly integrates teaching and research facilities. This lab space is now physically, but not visually, dissected into a 50-bench teaching and training facility and a BSL-2 open-spaced wet lab research facility. This design allows for hands-on training for students alongside state-of-the-art research labs, supporting the research objectives of faculty members. Core facilities for immunohistochemistry, imaging, genomics, and tissue culture further enrich the research environment, fostering collaboration and innovation among researchers.

These upgrades empower faculty and researchers to conduct pioneering research in molecular biology and pharmacology/drug development, while interactive spaces foster collaboration among students, staff, and faculty.

ANNUAL NIGHT AWARD RECIPIENTS

Dr Kanza Muzaffar
Excellence in Teaching

Dr Sadia Cassim
Early Career Teaching

Dr Amber Palla
Individual Award for
Innovation in Education

Team-Based Collaborative Award for Teaching: BBS Faculty for "Team-Based Learning"

Dr Kulsoom Ghias

Dr Sadia Fatima

Dr Fareena Bilwani

Dr Satwat Hashmi

Dr Kanza Muzaffar

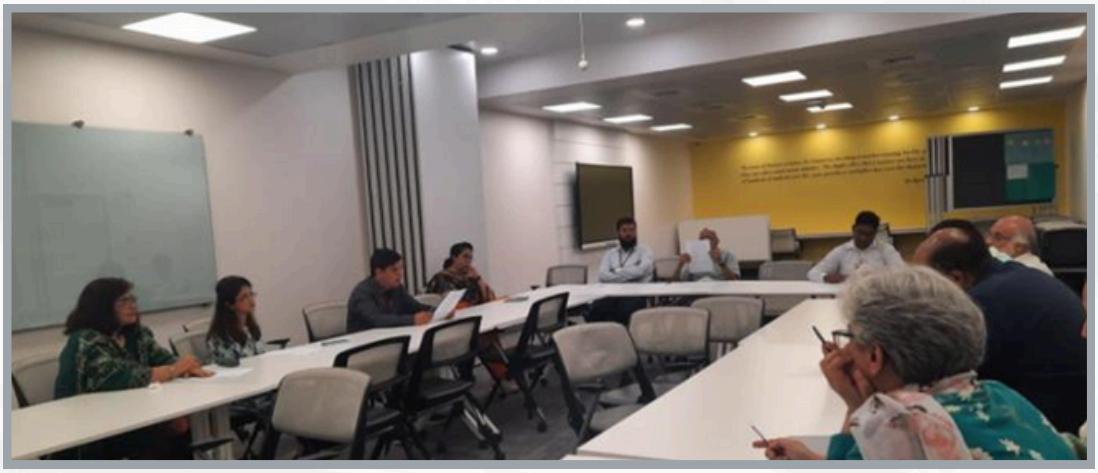
Dr Khalid Ahmed Hameed

THE GRADUATE STATION

Faculty Development Initiative

A workshop, Effective Supervisory Skills, was conducted on February 27, 2024, providing an engaging platform for the department's MPhil in Biological and Biomedical Sciences (MPhil-BBS) student supervisors to refine their mentoring abilities and uphold academic integrity.

Interactive activities and role-playing sessions led by esteemed facilitators encouraged skill development in communication, conflict resolution, and decision-making. The workshop was considered a success, largely attributed to meticulous planning and proactive addressing of challenges, enhancing participants' supervisory competencies and promoting excellence in academic mentoring.



Focus group discussions were conducted for evaluation of the MPhil-BBS program for both course directors and faculty members from April 24-25, 2024.

GRANTS

Ambrin Fatima (PI). Genetic investigations of inherited epilepsies in Pakistan: A step towards diagnostic gene panel; Pakistan Science Foundation.
This grant aims to advance the understanding of epilepsy through the molecular characterization and in vitro disease modeling of affected families. The project utilizes whole exome sequencing and induced pluripotent stem cells to create patient-specific neuronal cell types and cerebral organoids to identifying novel genetic variants and elucidating their roles in epilepsy.

Rehana Rehman (PI). Efficacy of Vitamin D supplementation in females with polycystic ovary syndrome: a randomized open label delayed-start design; Pakistan Science Foundation.
This grant hypothesizes that women suffering from Vitamin D deficiency will respond better to PCOS treatment if that deficiency is treated. The aim is to predict the usefulness of Vitamin D supplementation before or after standard PCOS care for effective management of PCOS, with the outcome being that correcting Vitamin D deficiency before any other treatment will have beneficial effects on fertility outcomes, insulin resistance and metabolic parameters.

Arooj Shafiq (PI). Contribution of KRas/Ral pathway in growth and progression of colorectal cancer carcinoma; Seed Money Grant, Aga Khan University.
This grant aims to elucidate the role of the Ral pathway downstream KRAS in the growth and progression of colorectal cancer. Ras oncogenic pathways are involved in many cancers. By understanding this pathway, we hope to identify new therapeutic targets and strategies to improve treatment outcomes for patients with colorectal carcinoma.

PUBLICATIONS

Samma ZH, Khan HN, Riffat S, Ashraf M, Rehman R. (2024). Unraveling the genetic associations of DENND1A (rs9696009) and ERBB4 (rs2178575) with infertile polycystic ovary syndrome females in Pakistan. Biochemical genetics, 62(3), 2148–2165. https://doi.org/10.1007/s10528-023-10537-z

Jafri L, Majid H, Ahmed S, Farooqui AJ, Effendi MUN, Riaz Q, Nasir N, Fatima SS, Nadeem S, Zaman M, Rashid RH, Ejaz A, Alvi N, Aslam F, Khan AH. (2024). Developing and piloting an online course on osteoporosis using a multidisciplinary multi-institute approach- a cross-sectional qualitative study. PloS One, 19(2): e0291617.

Lewis KO, Popov V, Fatima SS. (2024). From static web to metaverse: reinventing medical education in the post-pandemic era. Annals of Medicine, 56:1, 2305694. https://doi.org/10.1080/07853890.2024.2305694

Allana AA, Ali SK, Ghias, K. (2024). Bioethics curriculum for undergraduate medical students: an evaluation study utilizing mixed methods approach. BMC medical education, 24(1), 385. https://doi.org/10.1186/s12909-024-05376-4

Rourke J, Ghias K, Lilley P, Harden R. (2024). Building excellence into medical and health professional education programs. Medical teacher, 46(5), 600–602. https://doi.org/10.1080/0142159X.2024.2322219

Iqbal MP, Khurram M, Haider I, Shoaib M. Serum levels of biomarkers in COVID-19 patients in a hospital-based population in Lahore. Lahore Garrison University Journal of Life Sciences. 8(1):163-171.

Iqbal MP. (2024). Air pollution: challenges to human health in Pakistan. Journal of the College of Physicians and Surgeons Pakistan. 34(5), 507–508. https://doi.org/10.29271/jcpsp.2024.05.507

Khan AH, Khan U, Khan HN, Zahid N, Rehman R. Vitamin D supplementation in polycystic ovary syndrome: a randomized open label delayed-start design: study protocol. Protocol (Version 1) available at Protocol Exchange. 10.21203/rs.3.pex-2558/v1

PUBLICATIONS

Rehman R, Ahmad S, Nasir SP, Ali R. (2024). Acceptance of team-based learning by students and faculty: A pilot study. Pakistan Journal of Medical Sciences, 40(5). https://doi.org/10.12669/pjms.40.5.8515

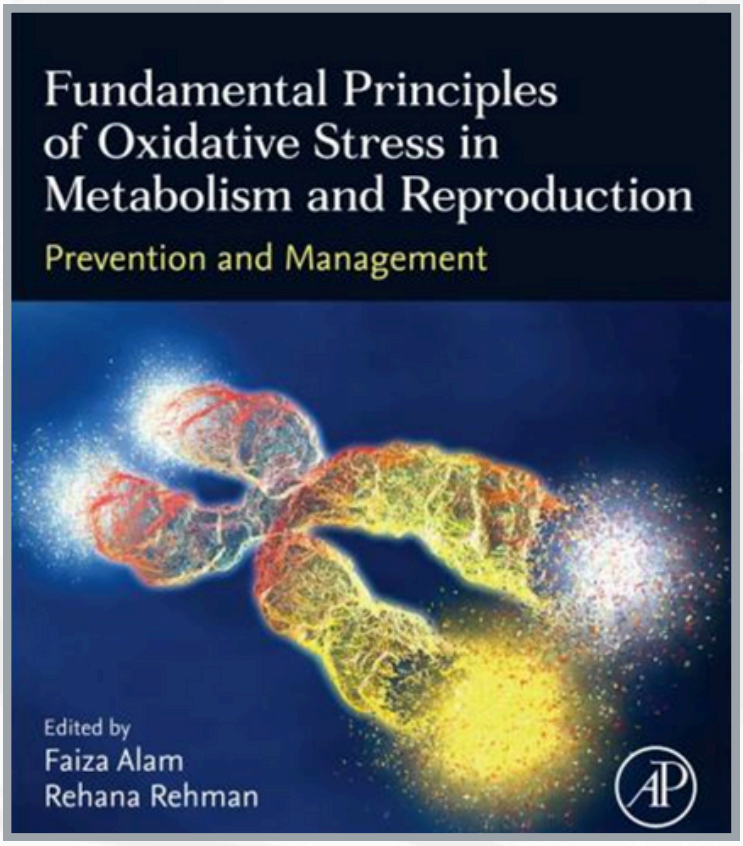
Fatima SS, Salman F, Farhat S, Palla AH. (2024). IDF23-0384 methylation, impaired fasting blood glucose, and cardiovascular disease risk in the Pakistani population. Diabetes Research and Clinical Practice, 209 (1). https://doi.org/10.1016/j.diabres.2024.111230

Ibrahim R, Zafar G, Ramzan S, Zahra H, Ali A, Ibrahim S, Toft M, Iqbal Z, Fatima A (2024). A novel homozygous frameshift variant in SPTBN4 causes axonal neuropathy with intellectual disability in a consanguineous family. ScienceDirect. Rare 2, 100037. https://doi.org/10.1016/j.rare.2024.100037

Book Publication

Dr Faiza Alam and Dr Rehana Rehman edited a book, Fundamental Principles of Oxidative Stress in Metabolism and Reproduction.

This book aims to shed light on the effects of oxidative stress (OS), offering a comprehensive understanding of its detection, connection to genetic predisposition and effective strategies for prevention and management. It also includes the impact of OS on Vitamin D availability, oncogenesis, subfertility, and cell death. Details of the prevention and management of OS, emphasizing the role of antioxidants, and complementary and alternative medicine are also included in one of the sections.



This book is available for purchase at: https://shop.elsevier.com/books/fundamental-principles-of-oxidative-stress-in-metabolism-and-reproduction/alam/978-0-443-18807-7