

DEPARTMENT OF BIOLOGICAL AND BIOMEDICAL SCIENCES

Believe

Become

Succeed

Message from the Chair

We are in the midst of a humanitarian crisis of monumental proportions. The consequences of heavy rainfall and flooding across Pakistan are catastrophic: the tragic loss of life, homes, livestock and livelihoods, the devastating collapse of an already weak infrastructure, to name a few. Climate change has been identified as a major contributing factor. As AKU mounts much-needed flood relief efforts, the situation is

a reminder yet again that time is short to safeguard our planet's future. Some scientists have started to question whether civil disobedience is justified in the face of inaction from other quarters. There are no easy answers or quick fixes to what is one of the most "wicked" problems of our time, but we have to ask ourselves: as members of a premier academic institution, what is our responsibility? What questions can we ask and answer at the intersection of health and climate change to improve Pakistan's circumstances? What programs can we develop and deliver, how can we train and educate the next generation of leaders to secure a sustainable future? Never more has there been a need for our dedicated efforts and for transdisciplinary collaborations. It is a call to action, but one for which we are equipped and capable of answering.

Warm regards,
Kulsoom

September
2022



FACULTY PROMOTIONS

**Congratulations to Dr Syeda Sadia Fatima on
being promoted to Associate Professor,
Biological and Biomedical Sciences**

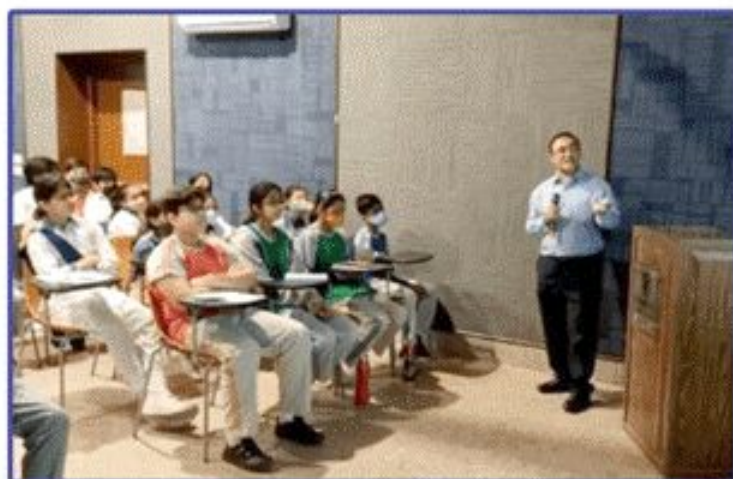


FROM THE HUB

Dr Shakil Ahmed Saghir, visiting faculty in the department has been selected as a mentor in National Institute of Health funded toxicology mentoring and skills development training program, hosted by the Department of Molecular Biosciences, School of Veterinary Medicine at the University of California, Davis.



Dr Hasan Salman Siddiqi was invited to Beaconhouse School PECHS campus, Karachi, on April 14. He conducted an informative session on developing a healthy lifestyle at a young age. Students from grades 6-8 attended this session. They interacted actively with the speaker to address queries related to health. Dr Salman's talk was highly appreciated by the head of the school and a souvenir was presented to him.



FROM THE HUB



A 5-day workshop (July 26-August 1) on optimization of protein extraction and western blotting was organized by Dr Azhar Hussain and Dr Satwat Hashmi. Ms Naheed Amir from the United Arab Emirates University was invited to conduct this workshop and provide hands-on experience with troubleshooting techniques at every step. The workshop was attended by BBS MPhil students, faculty and staff members.



Dr Najeeha Iqbal and Dr Mati ur Rehman conducted a grant writing workshop on June 25 covering the Grand Challenge Fund for Higher Education Commission proposal components, financial feasibility, risk mitigation plan, project implementation plan and steps to avoid common mistakes.

FROM THE HUB

Dr Sadia Fatima facilitated in university-wide workshops:

- How to engage your audience using easy-to-build presentations and interactive quizzes, June 21, 28-29
- Use of molecular techniques in medical research; importance & benefits for Pathology and Laboratory Medicine residents, March 25
- Pathology residents as teachers, May 16-19
- Rethinking teaching workshop, May 9-17
- Crack the case: Student research forum, May 23



She also attended the Virtual HKU Teaching & Learning Festival March 30-April 29, which focused on academic integrity and assessment security, digital storytelling and online interprofessional education.



Dr Rehana Rehman conducted a workshop on qualitative research; explore for impact in medical education-I on May 31. Dr Arfa Azhar and Ms Saira Khalid facilitated this workshop.

FROM THE HUB



A two-day workshop directed by Dr Tashfeen Ahmed and co-directed by Dr Fareena Bilwani on principles of laboratory and animal science was organized by the Office of Research & Graduate Studies in collaboration with Ethics Committee for Animal Care & Use (ECACU) and the Department of Continuing Professional Education (DCPE), Aga Khan University.



Dr Fareena Bilwani conducted sessions on post approval monitoring, factors affecting animal-based research and ethical review processes.

Dr Hasan Salman Siddiqi facilitated sessions on euthanasia in rats, mice, rabbits and guinea pigs. Endpoints for invasive procedures to minimize pain, distress and routes of drug administration in lab animals was discussed.

Dr Satwat Hashmi conducted a session on pain assessment and management in experimental animals. Dr Shakil Ahmed Saghir conducted a session on toxicological studies in lab animals.

FROM THE HUB



The department organized a one-day workshop to discuss good laboratory practices on March 4. This workshop aimed to familiarize MPhil and PhD students, research associates and junior laboratory staff members of BBS with safe laboratory practices standard operating procedures and laboratory protocols. The workshop was organized, planned, and conducted by Dr Farzana Abubakar along with Mussarat Ashraf, Sher Khan, Tahira Ghulam, Masnoon Akhter, Hira Rafi, Asra Khan, Mahwish Fatima, Ghulam Haider and Sabah Farhat under the guidance of Dr Satwat Hashmi and Dr Azhar Hussain.

FROM THE HUB



GUEST LECTURE

Congenital GnRH deficiency helps decipher the neuroendocrine control of reproduction

Friday, July 29 | Time: 11-12pm

Venue: Lecture Hall No. 1

BBS hosted a visit and guest lecture of Dr Nelly Pitteloud from the University of Lausanne, Switzerland. Dr Pitteloud is a world-renowned endocrinologist and her research focuses on the neuroendocrine and gonadal control of human reproduction, GnRH neuron ontogeny and the links between metabolism and reproduction. She delivered an excellent talk on the role of GnRH deficiency in deciphering the role of neuroendocrine control of reproduction.

Dr Ambrin Fatima, Assistant Professor in BBS, holds a collaborative grant with Dr Pitteloud from the Swiss National Science Foundation (SNSF): The Genetics of Congenital Hypogonadotropic Hypogonadism (CHH) in Pakistan.



FROM THE HUB

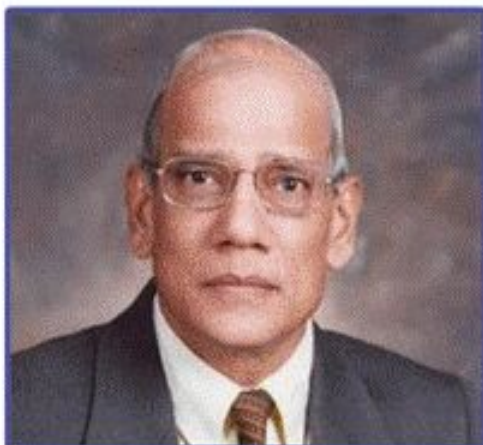


Dr Ambrin Fatima presented her work on biallelic founder mutation in PDE2A gene that causes paroxysmal dyskinesia with intellectual disability in Pakistani families at the European Society of Human Genetics annual meeting held in Vienna, Austria, June 11-14.

Dr Sadia Fatima presented posters at the DOHaD World Congress August 27-31, in Vancouver, Canada on:



1. The effect of parental health, nutrition and lifestyle choices on the future generation: how aware are we? [Co-authors included: Maheen Zakaria, Aliza Zakaria and Professor Ara Tekian]
2. Methylation of POMC is linked with high susceptibility to develop gestational diabetes and risk of childhood diabetes [Co-authors included: Dr Mohammad Ali Shoib, Dr Rehana Rehman, Dr Nuruddin Mohammad]



Dr HR Ahmad was invited and now serves as a reviewer on the Higher Education Commission's Board of Grant Review. He also serves on the Board of Advance Scientific Research, Sohail University.

THE GRADUATE STATION

BBS Mini-Symposia

The symposium provided an enabling environment to prepare graduate students for synopsis defense and research presentations on different forums. Two of our students from the batch of 2023, Dr Yousuf Tahir and Ms Mishal Shaheen presented on uncovering new antibiotic targets for the effective treatment of typhoid fever on May 10 and the role of added short chain fatty acids in therapeutic feeds in children with severe acute malnutrition on June 2, respectively. Both the symposia were chaired by Dr HR Ahmad.



Meet your Mentor

The office of MPhil in BBS encourages junior students to seek mentoring and discuss challenges in education. Meet your Mentor was the first step in building this relationship, where students were given a chance to meet peer mentors, seek guidance and define the way forward in scholarship and professional development.

THE GRADUATE STATION

MPhil in BBS Open House



An Open House event was arranged on June 16 for potential candidates who wish to seek information regarding obtaining an MPhil in BBS. The session aimed to provide an insight into thematic research areas of BBS faculty members and experiments/techniques carried out in our research and teaching laboratories. A chai and chat slot with current MPhil students concluded the session.

THE GRADUATE STATION



The MPhil Class of 2022 is at their penultimate milestone, i.e, thesis writing and submission. Thesis defense from the class is expected in December 2022 followed by graduation in March 2023.

GRANTS

1. Dr Sadia Fatima (PI), Dr Amber Palla. Epigenetic signature of adipokines, advanced glycation end products (AGE) and inflammatory cytokines as a risk predictor in metabolically healthy and unhealthy obese adults; PKR 1,998,433; Health Research Institute, National Institute of Health.
2. Dr Rehana Rehman (PI), Dr Aysha Habib, Dr Sumaira Naz, Dr Aisha Sheikh, Dr Arfa Azhar, Dr Shaista Afzal, Dr Iqbal Azam, Dr Haq Nawaz. Efficacy of Vitamin D supplementation and metformin compared to metformin alone in infertile females with polycystic ovary syndrome: A randomized open-label trial; PKR 4,457,955; University Research Council, AKU.
3. Dr Ambrin Fatima (PI), Dr Salman Kirmani, Dr Ayesha Malik, Dr Ghulam Zainab, Dr Fizza Akbar, Dr Waqasuddin Khan. Molecular investigations of idiopathic recurrent pregnancy loss (RPL) in Pakistani population; PKR 3,971,600; Swiss National Science Foundation.
4. Dr Satwat Hashmi (PI), Dr Ambrin Fatima, Dr Mati-Ur-Rehman, Dr Camer Vellani, Dr HR Ahmad. Mechanisms of the origin and development of Atheroma induced by inhaled chemical toxins; PKR 2,700,000; University Research Council, AKU.

PUBLICATIONS

1. Jabeen K, Ahmed I, Fatima S, Ghias K (2022). Blended team based learning sessions to enhance medical students' engagement. *Medical Education*, 56(8):858. <https://doi.org/10.1111/medu.14834>
2. Ali MK, Kadir MM, Gujral PA, Fatima SS, Iqbal R, Sun YV, Narayan KMV, Ahmad S (2022). Obesity-associated metabolites in relation to type 2 diabetes risk: A prospective nested case-control study of the CARRS cohort. *Diabetes Obesity Metabolism*, 24(10): 2008- 2016. <https://doi:10.1111/dom.14788>
3. Abid F, Rubab Z, Fatima SS, Qureshi A, Azhar A, Jafri A (2022). In-Silico analysis of interacting pathways through KIM-1 protein interaction in diabetes nephropathy. *BMC Nephrology*, 23:254-262. <https://doi.org/10.1186/s12882-022-02876-7>
4. Kumar W, Martins RS, Anjum N, Fatima SS (2022). Ischemia modified albumin as a useful marker for diagnosis and management of diabetic retinopathy. *Pakistan Journal of Medical Sciences*, 38(4). <https://doi.org/10.12669/pjms.38.4.4813>
5. Rehman R, Khan F, Kayani N, Ali TS (2022). Reflection of mentors and mentees at initiation of faculty mentorship program at Aga Khan University: A Perspective. *Pakistan Journal of Medical Sciences*, 28;38(6). <https://pjms.org.pk/index.php/pjms/article/view/5454>
6. Ahmed K, Sheikh A, Fatima S, Haider G, Ghias K, Abbas F, Mughal N, Abidi SH (2022). Detection and characterization of latency stage of EBV and histopathological analysis of prostatic adenocarcinoma tissues. *Scientific Reports* 12, 10399. <https://doi.org/10.1038/s41598-022-14511-4>

PUBLICATIONS

7. Hasan M, Moiz B, Qaiser S, Masood KI, Ghous Z, Hussain A, Ali N, Simas JP, Veldhoen M, Alves P, Abidi SH, Ghias K, Khan E, Hasan Z (2022). IgG antibodies to SARS-CoV-2 in asymptomatic blood donors at two time points in Karachi. *PloS one*, 17(8), e0271259. <https://doi.org/10.1371/journal.pone.0271259>
8. Ahmad S, Ahmed SB, Khan A, Wasim M, Tabassum S, Haider S, Ahmed F, Batool Z, Khaliq S, Rafiq H, Tikmani P, Gilani AU (2022). Natural remedies for Alzheimer's disease: A systematic review of randomized controlled trials. *Metabolic Brain Disease*, 10.1007/s11011-022-01063-9. <https://doi.org/10.1007/s11011-022-01063-9>
9. Nazim F, Kayani HA, Ali NA, Mir F, Abidi SH (2022). CMV and EBV co-infection in HIV-infected children: Infection rates and analysis of differential expression of cytokines in HIV mono- and HIV-CMV-EBV co-infected groups. *Viruses*, 14(8), 1823. <https://doi.org/10.3390/v14081823>
10. Fatima T, Arif U, Shaharyar S, Khan S, Ashraf M, Rafaqat W, Kayani MR, Rehman R (2022). MTHFR-c 677C>T polymorphism and male infertility: An analysis in a cohort of Pakistani men. *Revista Internacional de Andrologia*, S1698-031X(22)00057-7. <https://doi.org/10.1016/j.androl.2021.05.001>
11. Amin F, Zuberi S, Fatima SS (2022). The potential utility of lead compound, E18, in inhibiting docking of SARS-CoV-2 by inhibiting ACE2-B0AT1 complex. *Journal of the College of Physicians and Surgeons Pakistan*, 32(8), 1096–1097. <https://doi.org/10.29271/jcpsp.2022.08.1096>

PUBLICATIONS

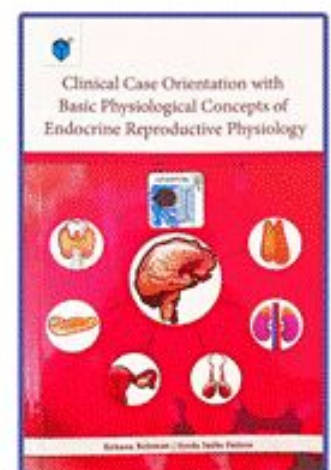
12. Rogawski MET., Brennhofer SA, Elwood SE, McMurry TL, Lewnard JA, Mduma ER, Shrestha S, Iqbal N, Bessong PO, Kang G, Kosek M, Lima A, Ahmed T, Liu J, Houpt ER, Platts-Mills JA (2022). Frequency of bystander exposure to antibiotics for enteropathogenic bacteria among young children in low-resource settings. *Proceedings of the National Academy of Sciences of the United States of America*, 119(36), e2208972119.
<https://doi.org/10.1073/pnas.2208972119>

13. Iqbal N, Rafiq M, Masooma Tareen S, Ahmad M, Nawaz F, Khan S, Riaz R, Yang T, Fatima A, Jamal M, Mansoor S, Liu X, Ahmed N (2022). The SARS-CoV-2 differential genomic adaptation in response to varying UV index reveals potential genomic resources for better COVID-19 diagnosis and prevention. *Frontiers in Microbiology*, 13, 922393.
<https://doi.org/10.3389/fmicb.2022.922393>

14. Ahmed MA, Nazim F, Ahmed K, Bari MF, Abdulwahed A, AlMokhatieb AA, Alalvi Y, Abduljabbar T, Mughal N, Abidi SH (2022). Association between the baseline gene expression profile in periapical granuloma and periapical wound healing after surgical endodontic treatment. *Scientific Reports*, 12(1), 13824.
<https://doi.org/10.1038/s41598-022-17774-z>

Book Publication:

Dr Rehana Rehman and Dr Syeda Sadia Fatima co-authored a book titled *Clinical Case Orientation with Basic Physiological Concepts of Endocrine and Reproductive Physiology*, Paramount, ISBN: 978-969-210-469-2 (2022).



STAY TUNED

Annual Biological Sciences Research Symposium



انسان کا پُر سسٹم
THE AGA KHAN UNIVERSITY

Organized by Department of
Biological and Biomedical Sciences

2nd Annual Biological Sciences Research Symposium

Theme: From Molecules to Networks

Tuesday, November 29, 2022
9:00 am-5:00 pm
Auditorium, Aga Khan University, Stadium Road Campus

Symposium Highlights

- Keynote lectures
- Invited talks
- Oral presentations
- Poster presentations
- ACCME accredited post-conference workshops [Nov 30 and Dec 1, 2022]

Coming Soon:
Call for abstract submission

Open to all faculty, students, trainees and scientists.

Symposium Chair : Dr Najeha Iqbal
Symposium Co-Chairs : Dr Rehana Rahman and Dr Sadia Fatima
Symposium Resource Person: Bilal Effendi | 021 3486 4560 | bilal.effendi@aku.edu



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