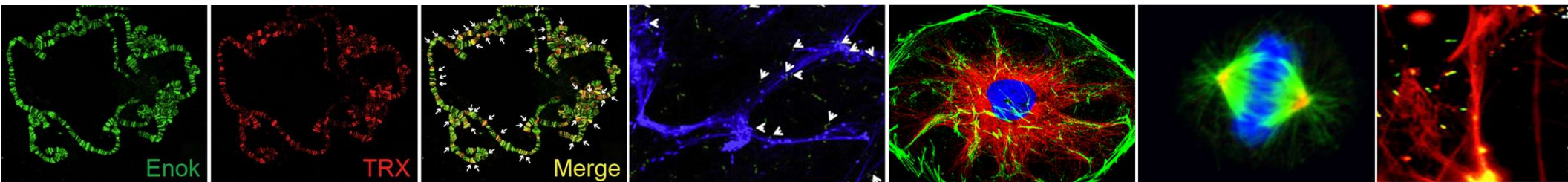


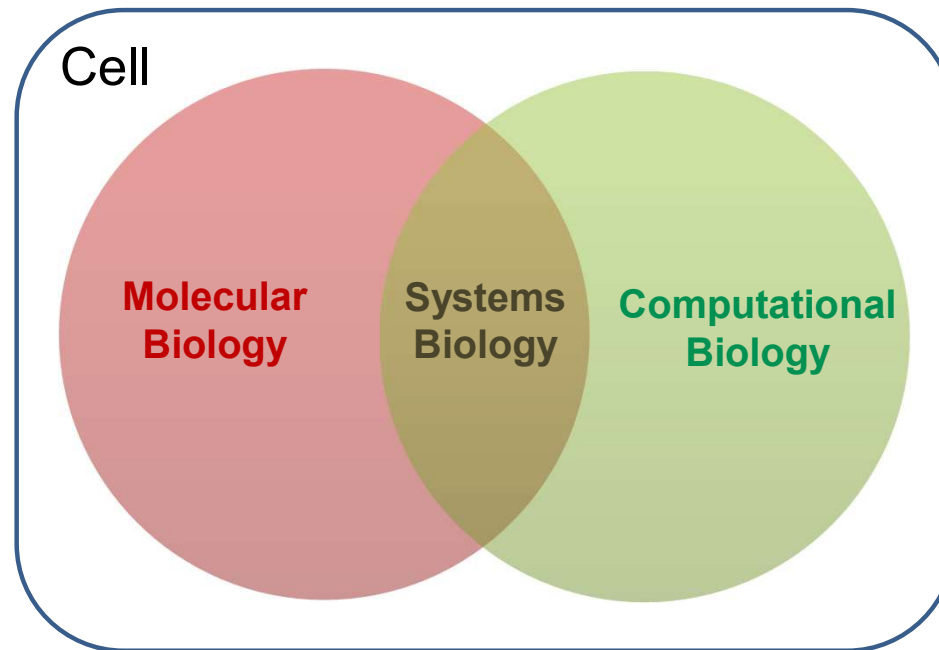
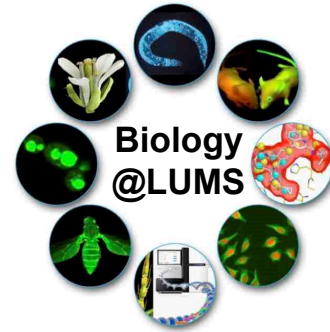
Biology @ LUMS

Amir Faisal
January 25, 2021



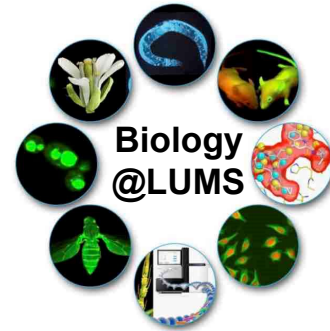
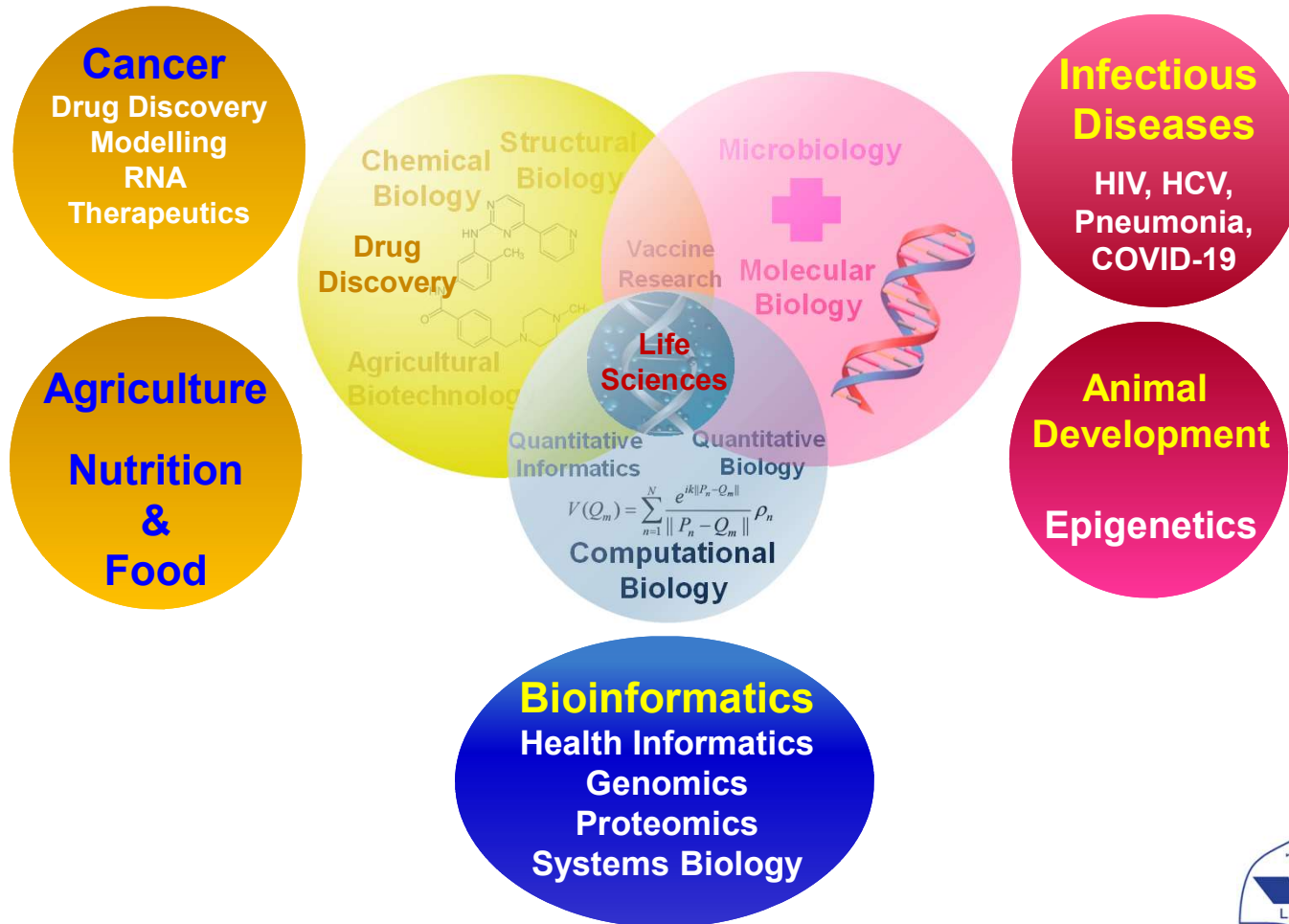
Vision of Biology Program

*To produce next generation of biologists who **understand living cell at systems level** and are ready to take up challenges of life science's research in biomedical sciences & agriculture*



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Research Focus

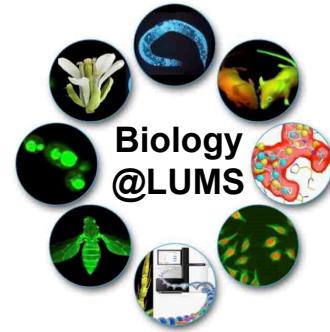


Teaching

- Rigorous undergraduate and graduate programs focusing on theoretical as well as experimental aspects of biology
- Offered 43 core and 7 elective courses during last two years.
- Courses are offered under two streams:
 - Molecular and Cellular Biology
 - Computational Biology
- A five-yearly review system for our curriculum currently underway

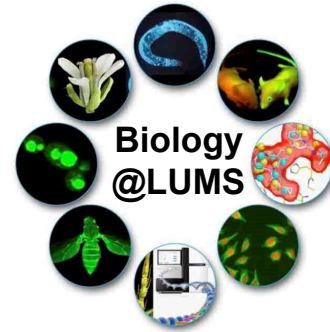
Challenges:

- Online teaching takes its toll on students and instructors alike
- Heavy teaching assignments – 3 courses a year along with active research programme
- Maintaining quality of class-room instruction



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Impact of Pandemic



➤ Adaptation to online teaching

- Both Synchronous and Asynchronous teaching
- Recordings of most lectures available on YouTube
- Use of drawing tablets as an alternative to blackboard
- Online exams through the LMS platform

	Courses offered Online		
Session	Total Number	Core	Elective
Spring 2019-20	13	12	1
Summer 2019-20	2	1	1
Fall 2020-21	11	9	2
Total Courses	26	22	4

➤ Impact on Research

- Labs closed for six months
- Progress of grants severely affected (Funding not proportionally extended in some cases)
- Progress of PhD students affected (PhD clock kept on ticking!)
- Effect on the consumables and equipment



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New Faculty



Dr Khurram Bashir

PhD in Agricultural Biotechnology
University of Tokyo, Japan

Area of research: Plant abiotic stress response
Joined 1st of January, 2021 as an Associate Professor



Dr Muhammad Shoaib

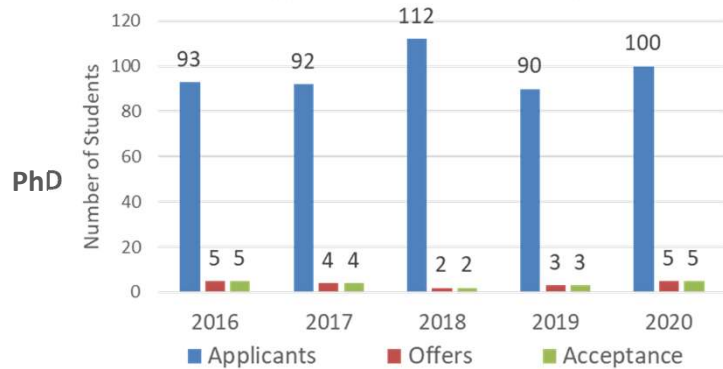
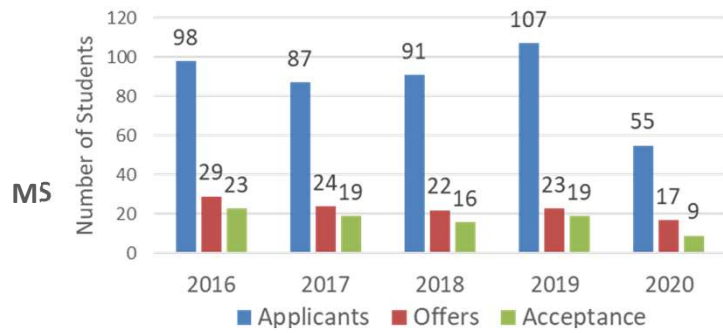
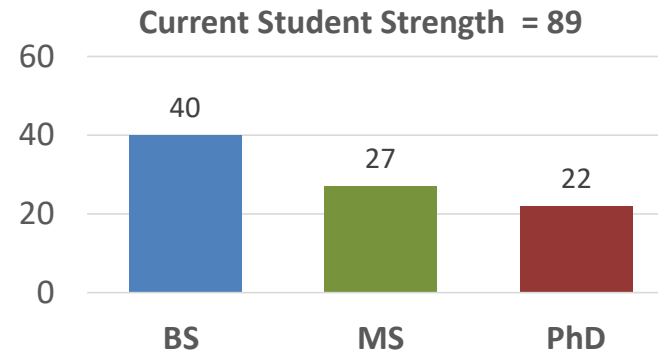
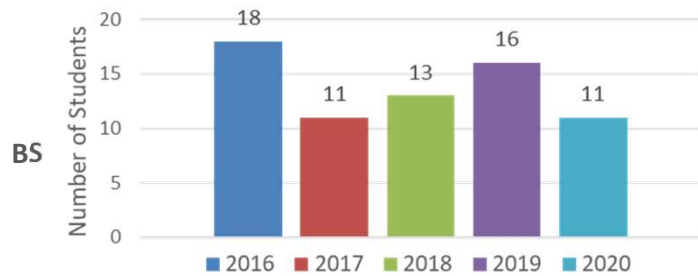
PhD Biochemistry, Molecular and Cellular Biology
University of Paris-Sud, France

Area of research: Chromatin Biology and Proteomics
Joining on 1st of April, 2021 as an Associate Professor



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Students in Biology



Placements in 2020 (7)



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First batch of PhD graduates



Student: ~~Muhammad Haider Farooq Khan~~
Thesis Title: ~~"Chromatin-wide RNAi screen uncovers role of Ballchen in maintenance of gene activation by trithorax group in *Drosophila*"~~
Supervisor: ~~Dr. Aziz Mithani~~
Supervisor Position: ~~Department of Cell and Tissue Biology, University of Illinois at Urbana-Champaign, USA.~~
Current Position: ~~Resident Physician, Department of Medicine, Northwestern University~~

Kinome-wide RNAi screen uncovers role of Ballchen in maintenance of gene activation by trithorax group in *Drosophila*

Muhammad Haider Farooq Khan, Jawad Akhtar, Zain Umer, Najma Shaheen, Ammad Shaukat, Aziz Mithani, Saima Anwar, Muhammad Tariq

doi: <https://doi.org/10.1101/2020.11.26.399824>

Chromatin
lication and

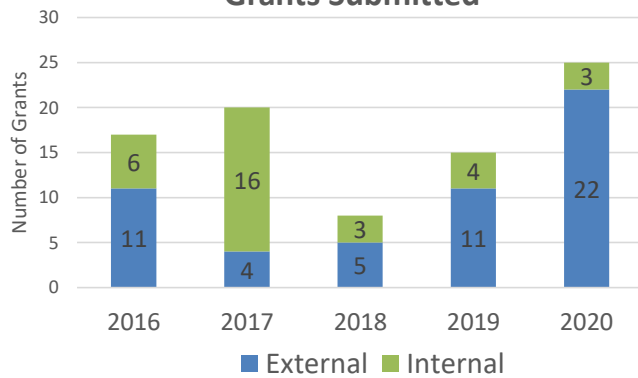
bioRxiv
 THE PREPRINT SERVER FOR BIOLOGY

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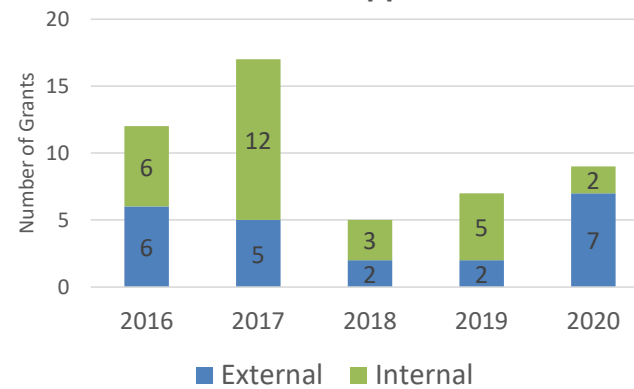
Grants



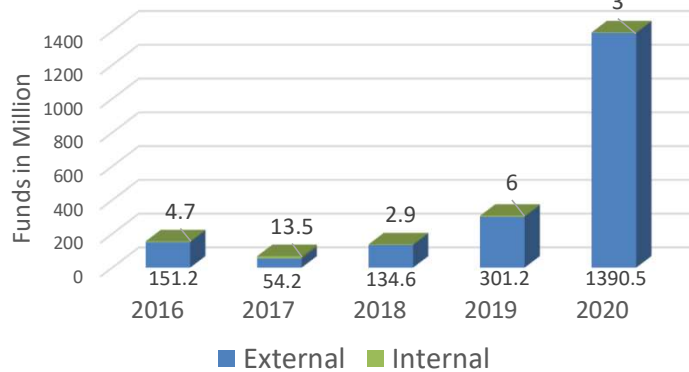
Grants Submitted



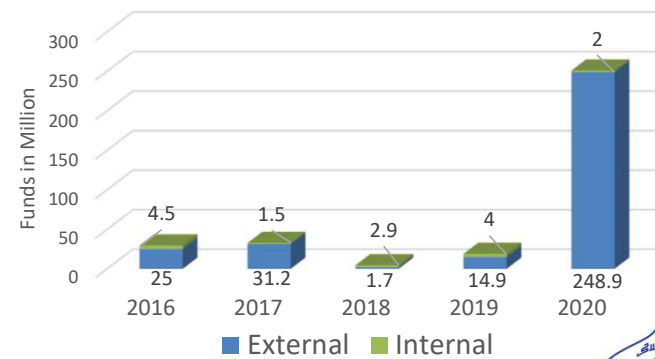
Grants Approved



Funds Requested

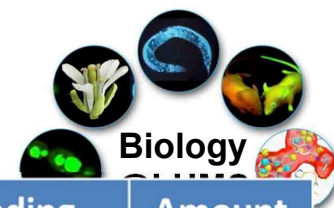


Funds Approved



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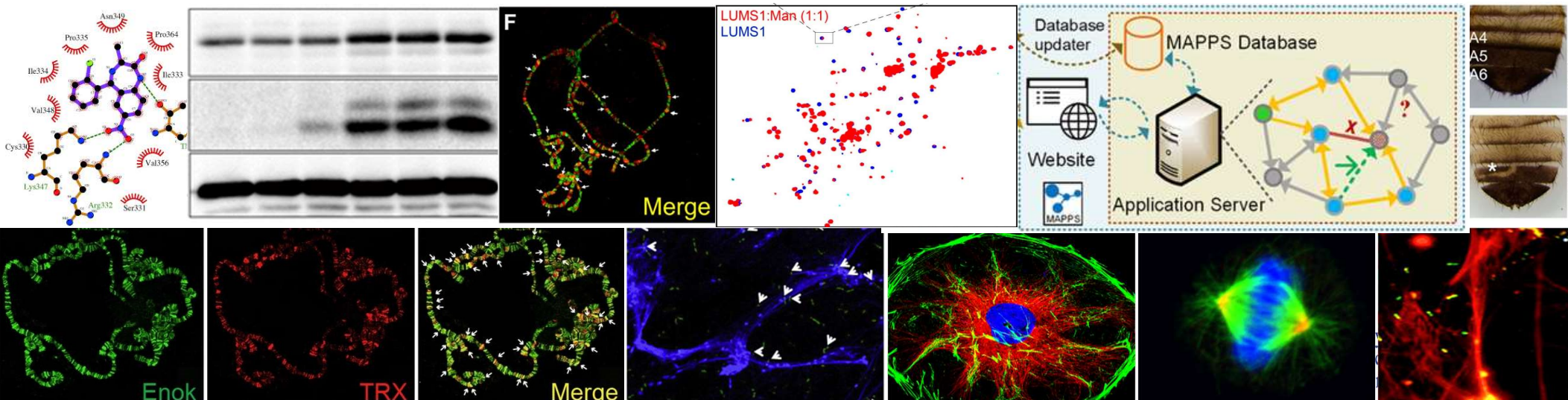
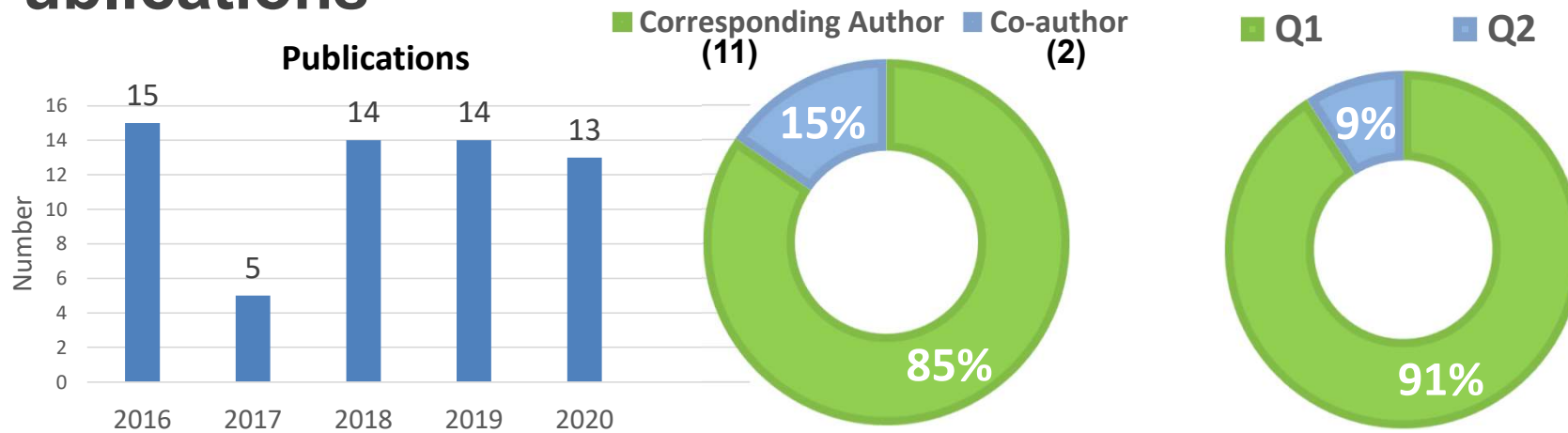
Submitted Grants



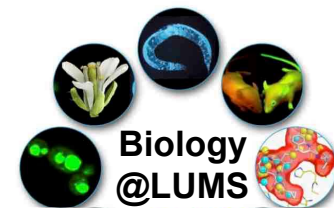
Grant Title	PI	Funding Agency	Amount in PKR
Mapping Immune Response to SARS-COV2 using a multidisciplinary approach (Approved)	Dr Shaper Mirza	HEC COVID-19 grants	12 million
Multi-target approach to discover potential therapeutics against corona virus and understand the target sites of neutralizing antibodies in vaccine design perspective	Dr Shahzad ul Hussan		15 million
Development of Point-of-Care antibody-based testing kits for COVID-19	Dr Amir Faisal		7 million
An innovative, large-scale, low-cost metaomics-based sustainable strategy for addressing heavy metal contamination and antimicrobial resistance in wastewater – A case study on Hudiera drain	Dr Safee Ullah Chaudhary	HEC GCF Grants	225 million
Multi-omics approach to comprehensively characterize the food and water quality in Pakistan	Dr Shahzad ul Hussan		210 million
Addressing challenges of malnutrition across the 1000 days of window of opportunity using an integrated multi sectorial approach for an improved and sustainable outcome.	Dr Shaper		224.5 million
Establishment of automated plant phenotyping system and screening cotton germplasm for drought and/or heat stress tolerance	Dr Khurram Bashir		151 million

nd

Publications



Publication Highlights



An Engineered Microvirin Variant with Identical Structural Domains Potently Inhibits Human Immunodeficiency Virus and Hepatitis C Virus Cellular Entry



Munazza Shahid^{1,†}, Amina Qadir^{1,†}, Jaewon Yang², Izaz Ahmad¹, Hina Zahid¹, Shaper Mirza¹, Marc P. Windisch^{2,3} and Syed Shahzad-ul-Hussan^{1,*}

MAPPS: A Web-Based Tool for Metabolic Pathway Prediction and Network Analysis in the Postgenomic Era



Muhammad Rizwan Riaz¹, Gail M. Preston, and Aziz Mithani^{*}

A cell-based high-throughput screen identifies inhibitors that overcome P-glycoprotein (Pgp)-mediated multidrug resistance



Rida Zahra¹, Muhammad Furqan¹, Rahim Ullah¹, Aziz Mithani¹, Rahman Shah Zaib Saleem², Amir Faisal^{1*}

Structural insights of key enzymes into therapeutic intervention against SARS-CoV-2



Munazza Shahid¹, Syed Shahzad-ul-Hussan^{*}

Journal of Structural Biology

Identification of potential inhibitors of three key enzymes of SARS-CoV2 using computational approach

Hafsa Iftikhar^a, Hafiza Nayyer Ali^b, Sadia Farooq^b, Hammad Naveed^{b,**}, Syed Shahzad-ul-Hussan^{a*}

Computers in Biology and Medicine



Transcriptomic analysis reveals differential gene expression, alternative splicing, and novel exons during mouse trophoblast stem cell differentiation



Stem Cell Research & Therapy

Rahim Ullah¹, Ambreen Naz¹, Hafiza Sara Akram¹, Zakir Ullah², Muhammad Tariq¹, Aziz Mithani^{1*} and Amir Faisal^{1*}

Natural and Semisynthetic Chalcones as Dual FLT3 and Microtubule Polymerization Inhibitors

Haleema Sadia Malik¹, Aishah Bilal¹, Rahim Ullah¹, Maheen Iqbal¹, Sardraz Khan¹, Ishtiaq Karsten Krohn¹, Rahman Shah Zaib Saleem¹, Hidayat Hussain^{*} and Amir Faisal^{*}



A cyanobacterial photorespiratory bypass model to enhance photosynthesis by rerouting photorespiratory pathway in C₃ plants

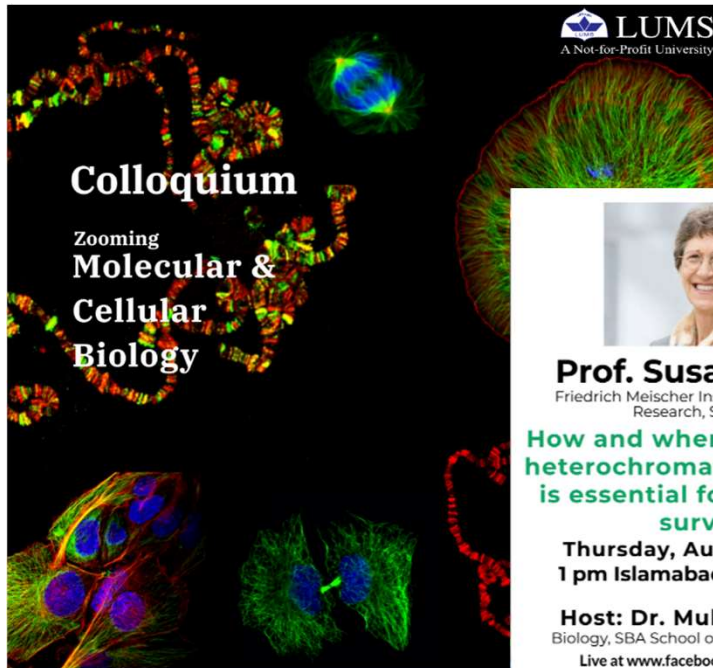
Ghazal Khurshid^{1,2}, Anum Zeb Abbassi¹, Muhammad Farhan Khalid¹, Mahnoor Naseer Gondal¹, Jatheer Alam Naqvi¹, Mohammad Maroof Shah¹, Safae Ullah Chaudhary¹ & Raza Ahmad^{1,2*}

scientific reports



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New Initiative by Tariq Lab (Zooming MCB)



LUMS
A Not-for-Profit University

Colloquium

Zooming Molecular & Cellular Biology



Prof. Susan Gasser

Friedrich Meischer Institute for Biomedical
Research, Switzerland

**How and where to assemble
heterochromatin, and why it
is essential for organismal
survival**

**Thursday, August 27, 2020
1 pm Islamabad Time (GMT+5)**

Host: Dr. Muhammad Tariq
Biology, SBA School of Science & Engineering
Live at www.facebook.com/sbasselums/



Dr. Stefan Schoenfelder

Group leader, Babraham Institute, United
Kingdom

**Functional organization of
the genome in 3D**

**Friday, September 11, 2020
3 pm Islamabad Time (GMT+5)**

Host: Dr. Muhammad Tariq
Biology, SBA School of Science & Engineering
Live at www.facebook.com/sbasselums/



Prof. Peter Becker

Chair, Biomedical Center, LMU Munich
Germany

**Genetic & Epigenetic
Mechanisms of X Chromosome
Activation in Drosophila**

**Friday, October 9, 2020
12 pm Islamabad Time (GMT+5)**

Host: Dr. Muhammad Tariq
Biology, SBA School of Science & Engineering
Live at www.facebook.com/sbasselums/



Prof. Sandra B. Hake

Institute for Genetics, JLU Giessen
Germany

**Histones: How much variation
do we need?**

**Friday, October 16, 2020
12 pm Islamabad Time (GMT+5)**

Host: Dr. Muhammad Tariq
Biology, SBA School of Science & Engineering
Live at www.facebook.com/sbasselums/



Prof. Dr. Juan Domínguez-Bendala

Director of Stem Cell Development for
Translational Research
University of Miami

**Advances in pancreatic beta-
cell regeneration**

**Friday, November 13, 2020
8 pm Islamabad Time (GMT+5)**

Host: Dr. Muhammad Tariq
Biology, SBA School of Science & Engineering
Live at www.facebook.com/sbasselums/



Prof. Dr. Detlef Weigel

Executive Director
Max Planck Institute for Developmental
Biology, Germany

**Epistasis, the Spice of Life (and
Evolution) – Lessons from the
study of the plant immune
system**

**Wednesday, November 25, 2020
2 pm Islamabad Time (GMT+5)**

Host: Dr. Muhammad Tariq
Biology, SBA School of Science & Engineering
Live at www.facebook.com/sbasselums/



Dr. Jernej Ule

Group Leader
The Francis Crick Institute
United Kingdom

**RNA Biology at the
crossroads of evolution and
disease**

**Friday, January 8, 2021
3 pm Islamabad Time (GMT+5)**

Host: Dr. Muhammad Tariq
Biology, SBA School of Science & Engineering
Live at www.facebook.com/sbasselums/



Dr. Oliver Bell

Assistant Professor, Biochemistry and
Molecular Medicine,
Stem Cells and Regenerative Medicine
Keck School of Medicine
University of Southern California

**How cell fate decisions are
maintained by Polycomb**

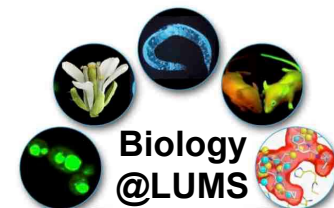
**Tuesday, July 28, 2020
9 pm Islamabad Time (GMT+5)**

Host: Dr. Muhammad Tariq
Biology, SBA School of Science & Engineering

via zoom

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Drug Discovery Symposium



VIRTUAL DRUG DISCOVERY SYMPOSIUM 2020



PROF JENNIFER SCHOMAKER
UNIVERSITY OF WISCONSIN-MADISON



PROF STEPHEN KNAPP
GOETHE UNIVERSITY, FRANKFURT



DR FLORENCE RAYNAUD
INSTITUTE OF CANCER RESEARCH UK



DR MANU DE RYCKER
UNIVERSITY OF DUNDEE, UK



PROF IROSHA NAWARATHNE
LYON COLLEGE, USA

The topics include

- Selective kinase inhibitors
- Bioorthogonal labeling reagents
- Role of pharmacokinetics in drug discovery and development
- High throughput screening
- Natural Products in drug discovery

Symposium date

August 08, 2020

For registration

please visit the following link

<https://tinyurl.com/vDDS2020>

Registration deadline

August 01, 2020 (5 PM PST)

Jointly organized by the research groups of



DR. AMIR FAISAL
ASSOCIATE PROFESSOR
AND CHAIR
DEPARTMENT OF BIOLOGY

DR. RAHMAN SHAH ZAIB SALEEM
ASSOCIATE PROFESSOR
DEPARTMENT OF CHEMISTRY
& CHEMICAL ENGINEERING

SBA SCHOOL OF SCIENCE AND ENGINEERING,
LAHORE UNIVERSITY OF MANAGEMENT SCIENCES,
OPPOSITE SECTOR-U, DHA, LAHORE, PAKISTAN

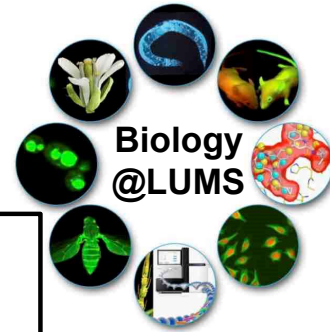


➤ 230 participants from 11 different countries



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Outreach Activities and Invited Talks in 2020



Outreach Activities

Dr. Shaper: Contributed to development of smart lockdown strategies at provincial level

Dr Shaper: Invited Presenter at Infocus South Asia - Indus News - Covid epidemiology, vaccine and infection transmission

Dr. Shahzad: Plenary speaker, Research Symposium at University of Sahiwal

Dr. Shahzad and Dr Shaper: Panelists at LUMS LIVE session 12 on “Our Scientific Preparedness for Health Emergencies”

Dr. Shahzad: Panelist at Khwarizmi Science Society’s second Webinar on “COVID-19 Corona Virus Testing and current scenario internationally

Invited Talks

Dr. Safee Ullah: *Best Presentation Award* by the Conference Program Committee, 14th International Conference on Systems Biology (ICSB 2020), Jan. 2020, Zurich, Switzerland.

Dr. Shahzad and Dr Shaper: Invited speaker at virtual seminar on “Academic Leadership and Covid-19 Crises”, Quad-e-Azam University, Islamabad, Pakistan

Dr. Shaper: Invited presenter at LUMS office of advancement

Dr. Shaper: Invited speaker at Academic leadership and Covid-19 crisis July 16 2020

Dr. Shaper and Dr Shahzad : STEM Star presentation



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New Collaborations



University of Würzburg, Germany



Institute of Public Health, Lahore



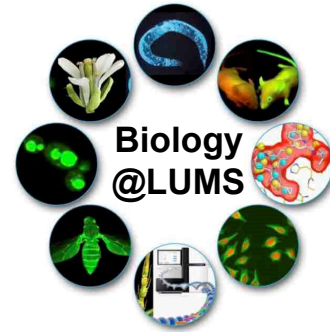
COMSATS University

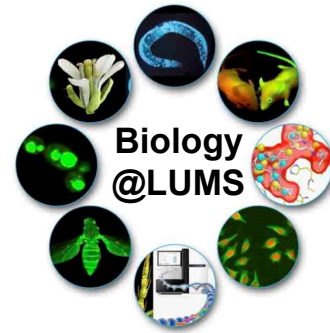


ETH zürich



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Expansion into 3rd Floor right wing

➤ Space limitations

- Lack of lab and office space
- Lack of BSL2/BSL3 + Animal housing facilities

➤ Basic Biomedical Laboratories

- Dedicated for Infectious Diseases and Drug Discovery

- Dedicated facility for research on infectious diseases as at the standards recognised by WHO
- Transformation of the SSE 3rd Floor right wing
- Construction of BSL2/3 Labs + Animal housing facilities

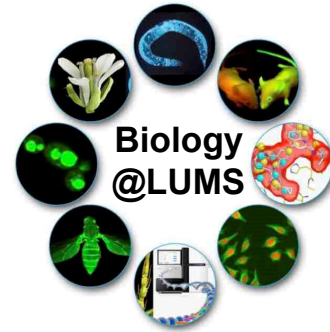
Current status:

- HEC, Bill and Melinda Gates Foundation, World Bank/HEC
- Floor plans being mapped
- Talks with Pharma Bureau and GSK for funding equipment (~90 million ruppies)



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Strengthening the Department – Challenges



- **Budget Constraints**
 - Limited avenues of funding (Reduced HEC NRPU Grants)
 - Budgetary cuts by the University
 - Devaluation of rupee compared to USD
 - Potential solutions: **Departmental Endowment**
- **Number of faculty members**
 - Currently 8 with one joining in April 2021
 - Minimum critical mass required: 12 faculty members
 - Important to build faculty clusters in our focal areas
- **Replacing the equipment**
 - Most of the equipment were purchased over 10 years ago
 - Depreciation policy working at the School level



