



MS & PhD **BIOLOGY**

EMPOWERING EVERY JOURNEY

Syed Babar Ali School of Science and Engineering



SYED BABAR ALI SCHOOL OF SCIENCE AND ENGINEERING (SBASSE)

LUMS and SBASSE Fostering a Dynamic Learning Environment

Founded in 1985 as a not-for-profit, LUMS believes in making quality education accessible while breaking academic, geographic, and socio-economic barriers to enhance students' academic exposure.

SBASSE at LUMS is advancing innovative teaching and impactful research in science and technology. The MS programmes offer rigorous, professional, and research-focused training, with two pathways: MS-by-Coursework or MS-by-Thesis. The PhD programmes prepare students for independent, high-quality research. Key milestones include Coursework, Comprehensive (Qualifying) Exams, Thesis Proposal Defense, at least one article in a peer-reviewed journal, and final PhD Thesis Defense.

WHY MS & PHD BIOLOGY AT LUMS?

■ Research Excellence:

- Faculty with international recognition and publications in top-tier journals
- State-of-the-art laboratories equipped with modern equipment

■ Interdisciplinary Approach:

- Cross-departmental collaboration
- Access to resources from engineering, computer science, and other sciences

■ Global Perspective and Impact:

- Research addressing regional challenges with global significance
- Strong alumni network across academia and industry

MS Biology provides advanced training in molecular and cell biology, population genetics, epigenetics, computational biology, and biomedical sciences. The programme prepares graduates for research-intensive careers in academia and industry.

The PhD Biology programme prepares students for independent, high-impact research in the life sciences. With expert faculty and advanced labs, it offers a strong foundation for academic and scientific leadership.

EMBRACE THE LIFE SCIENCES EXPERIENCE

Graduate students are exposed to advanced courses in a wide range of areas that include cell and molecular biology, genetics and genomics, biochemistry, and computational biology, and are provided training in different research methodologies. For their research, students can opt for one of the following research groups led by individual faculty members:

■ PLANT BIOTECHNOLOGY & MOLECULAR BIOLOGY

Dr. Khurrum Bashir

■ CELL SIGNALLING & CANCER THERAPEUTICS

Dr. Amir Faisal

■ EPIGENETICS & GENE REGULATION

Dr. Muhammad Tariq

■ EPIGENOME & GENOME INTEGRITY

Dr. Muhammad Shoaib

■ BIOMEDICAL INFORMATICS & ENGINEERING RESEARCH

Dr. Safee Ullah Chaudhry

■ COMPUTATIONAL BIOLOGY & INTEGRATIVE GENOME

Dr. Laraib Iqbal Malik

■ PLANT GENETICS & EPIGENETICS

Dr. Zaigham Shahzad

■ MOLECULAR EPIDEMIOLOGY & MICROBIOLOGY

Dr. Shaper Mirza

PUBLISHED RESEARCH HIGHLIGHTS

■ EVOLUTION WITHOUT CHANGES IN DNA SEQUENCES

Plant Genetics and Epigenetics lab's groundbreaking work, published in *Nature Plants*, reveals how natural variation in DNA methylation shapes plant traits and drives adaptation - transforming our understanding of evolution.

■ FIGHTING CANCER WITH PRECISION MEDICINE

Cell Signalling and Cancer Therapeutics lab developed novel Aurora and FLT3 kinase inhibitors for cancer therapy, published in *British Journal of Cancer*, opening new frontiers in targeted treatment.

■ REVOLUTIONISING CROP RESILIENCE

Plant Biotechnology and Molecular Biology team discovered how ethanol treatment enhances plant stress tolerance - research featured in *Molecular Biology* is changing agricultural practices.

■ UNLOCKING EPIGENETIC MYSTERIES

Epigenetics and Gene Regulation team's work on gene regulation in *Drosophila*, published in *Developmental Biology*, reveals new pathways influencing developmental patterning.

■ PERSONALISED CANCER TREATMENT

CANSEER platform, developed by the Biomedical Informatics & Engineering Research lab, creates patient-specific cancer models for precision therapy, featured in *Scientific Reports*.

■ PROTECTING VULNERABLE POPULATIONS THROUGH PRECISION VACCINATION

Molecular Epidemiology and Microbiology lab's research published in *Vaccine* journal reveals how to optimise immunisation for 33 million Pakistanis with diabetes - directly impacting the national health policy.



CAREER PROSPECTS

Our graduates pursue careers as:

- **Faculty and Postdoctoral Researchers** at top global universities. Continue advanced research in specialised fields, often leading to academic publications and collaborations
- **Scientists** in biotechnology, pharma, and agricultural R&D
- **Bioinformaticians & Data Scientists** in health, tech, and computational biology
- **Leaders in Public Health & Policy** addressing global challenges in public health
- **Entrepreneurs** launching a start-up in biotech and healthcare innovation
- **Policy Advisors** with government agencies to shape policies on biotechnology, conservation, or public health



“I completed both my MS and PhD in Biology at LUMS. This journey laid a strong foundation that helped me advance my research career. My mentors provided excellent research training and fostered an environment of support and encouragement. I developed the confidence and skills to pursue meaningful scientific questions and was able to publish my PhD work in high-ranking international journals.

AMMAD SHAUKAT
PhD Biology '17

ADMISSION CRITERIA AND FINANCIAL SUPPORT ADMISSION IS PURELY MERIT-BASED.

Scan to explore eligibility, deadlines, how to apply to the MS Biology programme and find out how LUMS can support your academic journey.



PhD Biology is a fully funded programme. Scan to find out details on how to apply.



PHD BIOLOGY ADMISSION CRITERIA FOR FOREIGN NATIONALS

Foreign nationals must obtain a visa and a no-objection certificate to study at LUMS, with support provided by the university. Applicants from developing countries may also apply via the TWAS–UNESCO portal: <https://rb.gy/j83y7v>. Scan to find out more.



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