Dow University of Health Sciences



Prospectus

BS Biotechnology

Session 2026-2027

Dow College of Biotechnology (DCoB)

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website: www.duhs.edu.pk

QUAID'S
Message To Youth



"**Pakistan** is proud of her youth, particularly the students who have always been in the forefront in the hour of trial and need. You are the nation's leaders of tomorrow and you must fully equip yourself by discipline, education and training for the arduous task lying ahead of you. You should realize the magnitude of your responsibility and be ready to bear it" **(Jinnah, 1947).**



(Lahore, 31 st October, 1947)



VICE CHANCELLOR'S *Message*

As the Vice Chancellor, I am privileged to welcome you and to witness the potential of these bright minds ready to make a positive impact on the world. The Institute of Business and Health Management (IBHM), DUHS, has been established to offer finest education in the specialized fields of business and healthcare management. Your decision to join IBHM will help you achieve a prosperous and successful future in line with your dream. This day marks the beginning of a new chapter filled with responsibility and purpose. You now stand as ambassadors of this institution.

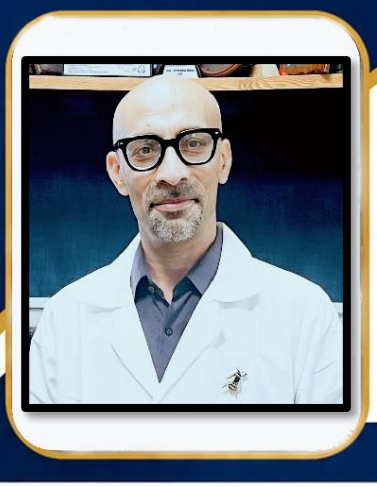
IBHM is striving to produce young graduates in the fields of Business and Healthcare Management, and it is an excellent place to be groomed at. DUHS has always been committed to nurturing not only competent professionals but also compassionate human beings who serve society with empathy and integrity. Our graduates reflect our vision, which is to produce future leaders and innovators who will contribute meaningfully to healthcare, research, and education at both national and international levels. The learned and dedicated faculty of the institute and its administration work in collaboration to enhance the learning experience of the students.

IBHM provides up-to-date research facilities to students to keep them abreast of the changing demands of the industry. Furthermore, IBHM will prepare the youth for facing contemporary challenges and inculcating a true spirit of love, dedication and community service at home and abroad. Wherever your professional path takes you, strive to uphold the values of service, ethics, and lifelong learning.

We welcome you to IBHM, a wonderful platform to polish your skills and acquire relevant knowledge, which will help you compete in the dynamic marketplace. Looking forwards, the faculty and staff of the University would build a harmonious relationship with you over the period of your studies and the professional career ahead. I extend my deepest appreciation to the faculty, mentors, and staff whose dedication will guide you throughout this journey. Their tireless efforts will help to mold you into capable individuals.

May your journey ahead be marked by success, purpose, and fulfillment. I wish you the best of luck in your academic endeavors.

PROF. DR. NAZLI HOSSAIN
VICE CHANCELLOR
Dow University of Health Sciences



PRINCIPAL

Message

It gives me immense pleasure to welcome the new batch of Dow College of Biotechnology. The world of science is fast-moving and progressing at a teeming pace. As a result, many new branches of science have been developed to entertain the need of time and to address emerging problems of the modern-day world. Biotechnology is one such branch of science, amalgamating classical and modern disciplines of both natural and physical sciences with a particular focus on seeking and developing practical applications of theoretical knowledge. Dow College of Biotechnology, an institute of the prestigious Dow University of Health Sciences, holds the same core theme in its foundation and the college is well regarded for imparting both academic and practical skills to the students.

Dow College of Biotechnology has progressed exceptionally well and is now known for its academics and research throughout the country. In recent times, research conducted at Dow College of Biotechnology during the COVID-19 pandemic has been praised both nationally and internationally and has led to some of the best research publications from Pakistan on SARS-CoV-2 with considerable theoretical and practical insights. The college also holds a dedicated fly research lab, the first and only in any public sector university in Pakistan, and the feat commonly obsereved in all leading universities around the globe.

The college holds a large sum of Ph.D. faculty actively engaged in research and teaching activities. To ensure the translation of theoretical knowledge into practical application, students are encouraged to get engaged with small to advanced-level research projects with faculty as they move along during the four years of their studies. This approach makes Dow College of Biotechnology unique amongst its contemporaries on regular forums.

Dow College of Biotechnology maintains a strong linkage with the industries to keep students aware of their recent developments and demands. The college has recently developed linkage and student exchange programs with some of the prestigious International Universities. With a team of highly competent faculty and supporting staff, I am confident that we will extend our utmost support to the students to excel in their respective careers.

I wish all the best to the prospective students at Dow College of Biotechnology, God Speed.

Prof. Dr. Mushtaq Hussain
Principal
Ph.D. (Genetics, Genomics and Systems Medicines)
University of Glasgow, UK

VISION STATEMENT DUHS

To be a pre-eminent academic institution committed to changing and saving lives.

MISSION STATEMENT DUHS

Providing outstanding patient centered education, training and clinical care informed by cutting edge research and innovation generating and disseminating new knowledge.

INTRODUCTION OF DOW COLLEGE OF BIOTECHNOLOGY

DOW COLLEGE OF BIOTECHNOLOGY

Dow College of Biotechnology (DCoB) is a constituent College of the Dow University of Health Sciences. The college is stationed in the graceful building of Dow Research and Diagnostics Complex. The college is centrally air-conditioned and spread over 30,000 sq ft. The college has 3 lecture halls, 1 seminar hall, 3 academic labs, 3 research labs, 1 library, dedicated thesis writing and discussion rooms for the students, and the girls' common room. The college has a bioinformatics suite with 27 computers augmented with a battery of software related to it. The college also has an in-house commercial facility "Dow Fly Research Lab and Stock Center". The first of its kind in any public sector university in Pakistan. The BS-Biotechnology curriculum has been regularly modernized and meticulously designed to produce competent human resources in the field of biotechnology, and to train the graduates to apply the gained scientific knowledge to address locally prevalent health, environmental, food, and industrial issues. The college is also catering to the postgraduate teaching and research of M. Phil. and Ph.D. studies enrolled in the field of biotechnology and other natural and clinical sciences at Dow University of Health Sciences.

Scope of Biotechnology in Pakistan

Biotechnology is one of the most growing and exciting fields of science in the world. Biotechnology is the application of any biological system (living organisms or their derivatives) to address any problem related to human life. It is a multidisciplinary science that utilizes knowledge generated in the fields of genetic engineering, cell and tissue culture, stem cells, molecular biology, microbiology, biochemistry, vaccinology, virology, and bioinformatics to address industrial, medical, and environmental issues. Biotechnology students are trained for innovation, creative thinking, entrepreneurship, and a multidisciplinary approach to developing products for the benefit of human life. There are different branches of biotechnology such as food biotechnology, health and medical biotechnology, microbial biotechnology, agricultural biotechnology, environmental biotechnology, pharmaceutical biotechnology, industrial biotechnology, marine biotechnology, animal biotechnology etc.

Following are few applications of biotechnology:

- To produce r-DNA products, monoclonal antibodies, vaccines, diagnostics, anticancer drugs, insulin, skin grafting, and the development of tissue-specific delivery methods.
- To produce safe, efficient, and cost-effective industrial chemicals and enzymes for textile, paper, sugar, and food industries, biodegradable plastics, etc.
- To produce a wide range of GM crops, bio-fertilizers, and bio-pesticides.
- To improve environmental conditions through soil and water remediation, oil spillage, water, and sewerage treatment.
- To produce fermentation-based products, cheese, yeast, wine, beer, yogurt, food additives, etc.
- Resultantly, the students of Dow College of Biotechnology are placed at prestigious institutes and industries in Pakistan and abroad in the area of research and development, drug manufacture, quality control, and academia.

Objectives of the Program

- To develop strong theoretical and practical foundations amongst graduates in different disciplines of science that coalesce in biotechnology.
- To provide challenges that instigate students to transform their theoretical knowledge into practical solutions.
- To enhance critical thinking and interrogative analytical skills amongst the graduates.

Eligibility Criteria of the Candidate

- HSSC Intermediate Science (Pre-Medical or Pre-Engineering)/ A-Level or Equivalent, Min. 60% marks or equivalent only certified by IBCC.
- Candidate's holding domicile of Sindh Province.

Seat Distribution for BS-Biotechnology at Dow College of Biotechnology

Dow College of Biotechnology offers a total of 100 seats, which are filled on a merit basis.

FEE STRUCTURE – BSBT– Session 2026-27

DOW COLLEGE OF BIOTECHNOLOGY - DCOB

Fee Type	Amount in PKR
Admission Fee – (at the time of admission)	PKR 45,000/-
Tuition Fee – (per annum)	PKR 185,718/-
Student Activity Charges – (per annum)	PKR 10,000/-
Library Fee Charges – (per annum)	PKR 10,000/-
Documents Verification Charges – (at the time of admission)	PKR 2,500/-
Without Transport	**PKR 253,218/-**
Transport Fee – **(**Optional**) – (**per annum**)**	PKR 50,000/-
With Transport	**PKR 303,218/-**

- Above amounts are excluding govt. taxes. Taxes apply as per Govt. & FBR rules.

– RULES FOR THE PAYMENT OF FEE –

The fee for each subsequent year of the respective category will have to be paid within one month of the commencement of 2nd, 3rd ,4th, Final Year.

If Payment is made after the due date, a late fee charge of 5% will be levied on the total fee.

Fee of all categories will be increased by 10% every year.

AFTER FOUR MONTHS OF NON-PAYMENT, THE SEAT IS LIABLE TO BE CANCELLED AND STUDENT WILL NOT BE ALLOWED TO APPEAR IN ANY EXAMINATION.

- Fee deposited is refundable as per the Refund policy guidelines of the DUHS.
- Taxes will be applied as per the FBR/SBR rules.
- Hostel and Transport fee will charge as per calendar year (i.e., Jan. to Dec.).
- Amounts stated in the fee vouchers are excluded of all Bank Charges.
- The Fee Structure may be revised by the university at any time during the course of the study, due to unavoidable circumstances.

All Professional Year & BS Program students are required to submit an **undertaking** affirming that they will not waste their allotted seat.
If a student withdraws from the program or fails to join after securing admission, a **SEAT WASTAGE PENALTY AS PER COMPLETE PROGRAM TUTION FEE** shall be imposed.

Career Prospects/ Opportunities

Biotechnology is an interdisciplinary science that provides a fascinating platform to grow and experience the diverse fields of science and technology. It is revolutionizing new prospects and developments to improve the quality of human life. Due to the strong academic and practical training provided to biotechnology graduates, they are among the top choice of academic, research, and industrial employers. Demand for biotechnology products is rising in Pakistan therefore, there is a huge scope for biotechnology students in terms of jobs and entrepreneurship. After completing their graduation, biotechnologists will be able to choose their career in research and development sectors of various industries including textile, food, biofuel production, cosmetics, etc. They can also find their career in diagnostic laboratories and pharmaceutical industries. The horticulture industry and agriculture biotechnology laboratories and research centers are also captivating targets for newly graduated biotechnologists. Biotechnology also offers a wide range of career opportunities related to academics and research in various Institutes and Universities. It also provides innovative and exciting job opportunities in scientific and administrative sectors. Students graduate from Biotechnology secure positions at esteemed institutions and industries both nationally and internationally, focusing on research and development, drug design, quality control, and academia.

Recognition by Governing Bodies/Councils The BS-Biotechnology program is approved by the syndicate of Dow University of Health Sciences, and the curriculum is approved by the Higher Education Commission, Pakistan. The curriculum has been designed following the centralized BS-Biotechnology curriculum of HEC-2024 with the availability of a series of quality-based laboratories are one of the chief factors in deciding the success of the program. The laboratories available at the DUHS are state-of-the-art and sufficiently equipped to facilitate the learning objectives of this curriculum.

Curriculum

BS Biotechnology at DUHS is a four-year degree program comprising eight semesters in total. The course layout is prescribed by the Higher Education Commission (HEC) of Pakistan, which consists of 48 courses of 138 credit hours. In this program, great emphasis is placed on integrating theory with practice as the curriculum is divided into both theoretical and laboratory-based learning. It is to enable students to attain the required level of expertise, before further practically testing out classroom knowledge through experiments.

STRUCTURE

S. No.	Categories	No. of Courses	Credit Hours
1	General Education Courses	13	32
3	Discipline related courses / Major	29/30*	85/88*
4	Interdisciplinary/Allied Courses	4	12
5	Internship		3
6	Capstone Project	2 (Research Thesis or Project + Media in Sciences)	(6 or 3+3)
	Total	**48**	**138**

- Total number of credit hours — 138
- Duration — Minimum: 4 years; Maximum: 6 years
- Semester duration — 16-18 weeks
- Semesters — 8
- Course load per semester — 15-21 credit hours
- Number of courses per semester — 5-7

* The Thesis students credit hours are equilibrated with the thesis spanning 2 semesters covering 6 credit hours

BS-BIOTECHNOLOGY (4 YEAR) CURRICULUM DESIGN

General Education Courses 13 Courses 32 Credit Hours			
Subject	**Cr. hr.**	**Subject**	**Cr. hr**
1. Natural Science-Principles of Biology	2+1	8. Social Sciences	2+0
2. Quantitative Reasoning I	3+0	9. Islamic Studies (Ethics for Non-Muslim Students)	2+0
3. Functional English	3+0	10.Time Management & Organization Skills	2+0
4. Application of Information & Communication Technologies (ICT)	2+1	11. Civics & Community Engagement	2+0
5. Arts & Humanities	2+0	12. Entrepreneurship	2+0
6. Quantitative Reasoning II	3+0	13. Ideology & Constitution of Pakistan	2+0
7.Expository Writing	3+0		

Disciplinary/ Major		Interdisciplinary/ Distribution Courses		Capstone Research Project	
29 Courses		4 Courses		2 Courses	
85 Credit Hours		12 Credit Hours		6 Credit Hours	
Subject	Cr. hr.	Subject	Cr. hr.	Subject	Cr. hr.
1. Cell Biology	3+0	1. Organic Chemistry	3+0	1. Media in Science / Research Project I	3+0
2. Biochemistry-I	2+1	2. Ecology & Biodiversity	3+0	2. Research Project II	3+0
3. Biochemistry-II	2+1	3. Physical Chemistry	3+0		
4. Microbiology	2+1	4. Biophysics			
5. Principles of Genetics	3+0				
6. Analytical Chemistry & Instrumentation	2+1				
7. Molecular Biology	2+1				
8. Introduction to Biotechnology	3+0				
9. Immunology	3+0				
10. Methods in Molecular Biology	2+1				
11. Biostatistics	3+0				
12. Microbial Biotechnology	2+1				
13. Bioinformatics	2+1				
14. Recombinant DNA technology	2+1				
15. Agriculture Biotechnology	3+0				
16. Principles of Biochemical Engineering	3+0				
17. Genomics & Proteomics	3+0				
18. Food Biotechnology	2+1				
19. Scientific Inquiry & Research Methods	3+0				
20. Industrial Biotechnology	2+1				
21. Health Biotechnology	3+0				
22. Biosafety, Biosecurity & Bioethics	2+0				
23. Artificial Intelligence in Biotechnology	2+0				
24. Virology	3+0				
25. Nanobiotechnology	3+0				
26. Environmental Biotechnology	2+1				
27. Molecular Diagnostics	3+0				
28. Seminar I	2+0				
29. Cell & Tissue Culture	3+0				

ASSESSMENT METHODS

The examinations for BS Biotechnology are conducted semester-wise through a centralized examination department. Assessments are both theoretical and practical based on the requirements of a specific course. An internal evaluation by the respective faculty members based on pre-defined scoring criteria is also included in the assessment. A student needs to pass the previous semester's courses, including any prerequisites, before moving on to the next semester. All 48 courses, including disciplinary and interdisciplinary courses along with credit hour-based capstone research projects, must be passed to claim the degree.

NUMBER OF STUDENTS GRADUATED AND STUDYING

Year of Enrollment	No. of Students Enrolled	No. of Students Graduated
2016	76	68
2017	100	93
2018	100	97
2019	100	93
2020	100	92
2021	90	88
2022	96	TBA
2023	100	TBA
2024	100	TBA
2025	101	TBA

*TBA: To be announced

Inauguration of the New Dedicated Building of Dow College of Biotechnology

The new dedicated building of Dow College of Biotechnology has been inaugurated on 15th March 2023. The formal inauguration was done by Prof. Dr. Ahsan Iqbal Choudhary, Federal Minister of Planning Commission and Development, Pakistan.



کراچی: ڈاؤ یونیورسٹی اوجھا کیمپس میں ایڈوانسڈ مالیکیولر جینیٹکس اینڈ جینومکس لیب کے افتتاح، ڈاؤ فلائی ریسرچ لیب اینڈ اسٹاک اور کالج آف بائیوٹیکنالوجی کے معائنے کے بعد مہمانِ خصوصی وفاقی وزیر پروفیسر احسن اقبال چوہدری اور وائس چانسلر پروفیسر محمد سعید قریشی خطاب کر رہے ہیں



FACILITIES

The Dow College of Biotechnology (DCoB) is a centrally air-conditioned facility holding a dedicated floor in the Dow Research and Diagnostics Complex located in the Southeast of the Dow University of Health Sciences, Ojha Campus. DCoB has three (03) state-of-the-art academic and research laboratories equipped with all basic and advanced instruments that are required for biotechnology research. DCoB also possesses a Dow Fly Research Lab and Stock Center and dedicated animal and plant cell culture laboratories. DCoB is holding three (03) lecture halls equipped with multimedia facilities and a capacity of 100 students in each. A dedicated and well-equipped seminar room for postgraduate students is also a part of the DCoB facility. The in-house advanced library with recent editions of all basic and advanced biotechnology books is also a part of DCoB to facilitate students' learning.

Academic and Research Laboratories









Dow Fly Research Lab and Stock Center

Dow College of Biotechnology has a dedicated Drosophila research facility “Dow Fly Research Lab and Stock Center”. The facility is the first of its kind in Pakistan in any public sector University. In addition to the research, the facility is also engaged in the Bioactive Molecule Screening, Oncogenicity and Teratogenicity testing, Hepatotoxicity, and Nephrolithiasis testing in animal models.









Bioinformatics Laboratory

A dedicated bioinformatics lab is equipped with high-technology equipment of 20 computers with updated software and servers, capable of doing a variety of bioinformatics analysis and effective learning.







Lecture Halls

The college has three large lecture halls and one seminar room for conducting lectures which are equipped with computers connected with multimedia to facilitate the delivery of lectures.





College Library

The DCoB library has a vast collection of multidisciplinary books covering the basic to advance levels of the all the subjects included in the BS biotechnology curriculum adopted at DCoB. The collection includes updated books on Biotechnology, Microbiology, Biochemistry, Bioethics Organic and Inorganic Chemistry, Physiology, Pathology, Immunology, Virology, Tissue Culture Techniques, Pharmaceutical Sciences, Plant Biotechnology, Animal Biotechnology, Industrial Biotechnology, Economics, Molecular Biology, Bioinformatics, Artificial Intelligence and Machine Learning.





Bioprocessing Unit

Dow College of Biotechnology is also furnished with a large-scale Bioprocessing Unit. This makes the college first of its kind in Pakistan being equipped with industrial scale fermentation plant. The unit has a capacity of 500 L that is laced with all the gadgets linked with modern fermentation technology. The plant is commissioned to not only provide relevant research platform but also to provide students hands on experience of industrial scale production of biotechnological cellular and molecular products.



EXTRACURRICULAR ACTIVITIES

ORIENTATION DAY OF DCoB-2026



SPORTS TEAMS OF DCoB



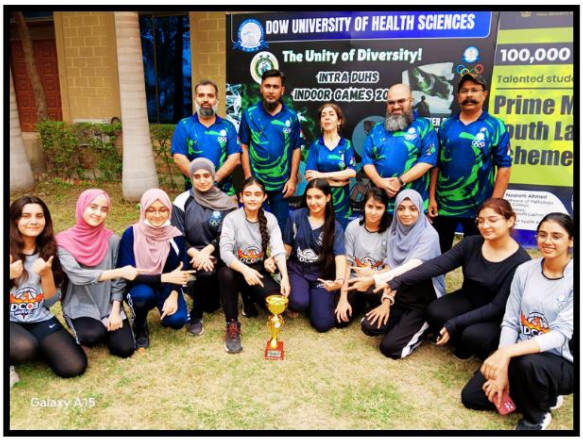
DCoB Girls' Team "Marvels" Winners of the Dow Premier League 4 (DPL 4) DUHS



BS Student secured 1st Prize in the Chess Competition at Intra-DUHS Indoor Games



BS Students securing the Runner-up Position in the Table Tennis Singles & Doubles Competitions



DCoB Girls team secured 1st Position in Basketball Competition at DUHS



DCoB Girl's Throwball Team securing the Runner-up Position in Throwball Competition at DUHS

MEDIA EXPOSURE OF DCoB STUDENTS



PARTICIPATION OF DCoB FACULTY IN NATIONAL AND INTERNATIONAL SCIENTIFIC EVENTS



SUPARCO handed over a 2D Clinostat to Dow Fly Research Lab and Stock Center.



Oral presentation in the 16th ISNPC at ICCBS, University of Karachi



Oral presentation in MMDR international Conference at ICCBS



Guest Speaker in the workshop on Combating Antibiotic Resistance at FUAAST



Oral presentation in the 1st International Congress on Nanoscience and Nanotechnology (ICNN-1) at ICCBS, UoK



Oral presentation in the 1st International Congress on Nanoscience and Nanotechnology (ICNN-1) at ICCBS, UoK

ACHIEVEMENTS AND RECENT PRIZES AWARDED TO DCoB STUDENTS



BS students have secured 2nd Position in the All Karachi Quiz Competition



BS student secured 2nd Position in Intra DUHS Bilingual Declamation Contest



DCoB secured 3rd position for Poultry Vaccine development at 8th DUHS-DICE



DCoB Students Team "Ecoplast" won a Rs. 500,000/- grant at FPCCI



BS students Team "Spiro Essentia" awarded Most Creative Idea at Zindagi Prize-DUHS



BS students Team "Magnalgesic" secured Second Runner Up position at Hult prize



DCoB students won 3rd position in Annual Research Talk, Research Poster Competition at



A DCoB M.Phil. scholar secured the Second-Best Poster Prize



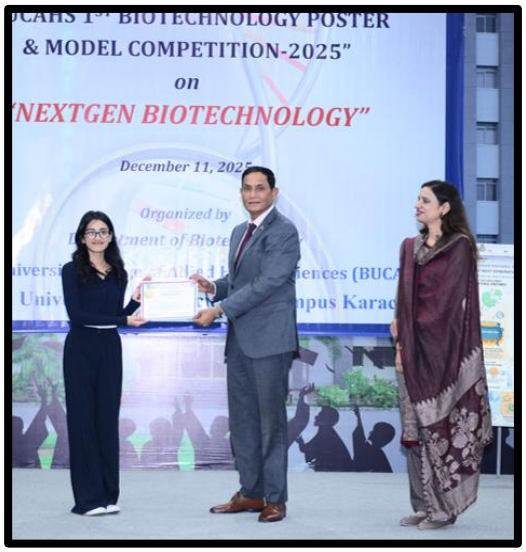
BS students Team “Filtresha” secured 3rd Prize at Ideatex by XSeed



A BS student secured 2nd Position Intra DUHS National Song Singing Competition



BS Students secured 1st position in 3D Model Competition at Bahria University



BS Students secured 1st position in Poster Competition at Bahria University

SELECTED INTERNATIONAL PUBLICATIONS OF DCoB FACULTY AND STUDENTS FROM 2020 ONWARDS

1. Nasir M, Naeem A, Khan LZ, Zaib N, Khan H, Najam Z, Gul A. Green synthesis of ZnO nanoparticles from melon peel and mint stem: antibacterial, antioxidant, and dye degradation potential. Scientific Reports. 2026 Apr 4; 16:16320.
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3. Abedin Q, Baqai H, Fatima T, Ilyas A. miRNA-1231 Regulated EGFR Signaling: A Potential Therapeutic Target for Hepatocellular Carcinoma. Applied Biochemistry and Biotechnology. 2026 Feb 2:1-3.
4. Aman A, Shahid F, Ansari A, Sohail M. Enhanced catalytic turnover and robustness of laccase from Trametes pubescens through carrier-free aggregation. RSC Sustainability. 2026.
5. Henry A, Imad R, Amir S, Roghay SS, Bibi A, Khan SA. TRPML1 regulates Mitochondrial and Lysosomal mediated Cell Death in Triple-Negative Breast Cancer Cell Line: Cytotoxic Effects of ML-SA5 in TNBC Cells. Allied Medical Research Journal. 2026 Jan 30; 4(01):13-21.
6. Ullah S, Kayani HA, Naz S, Ali HM, Fatima R, Haq F, Ahmed HA, Yousaf MZ, Aslam J, Rehman HMS and Sajid N. Anatomical and molecular identification of Culex mosquitoes and comparative larvicidal efficiency of Aloe vera and Cassia fistula green synthesized silver nanoparticles. Asian J. Agric. Biol. 2026, e2026056
7. Ali P, Roome T, Fatima T, Usman M, Zaman U, Mirza T, Sarwar Z, Aslam Z, Faizi S, Raza Shah M. Anti-inflammatory and anti-atherosclerotic potential of opuntiol, opuntioside-I, and opuntiol's silver nanoparticles: The role of cytokines and chemokines. Future Journal of Pharmaceutical Sciences. 2025 May 12; 11(1):54.
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9. Zafar S, Balouch A, Gul A, Qayyum S, Muzafar W, Khan H, Jabeen A, Akram J, Azhar I, Shah MR. Development of Polydopamine coated Niosomal formulation for Improved antioxidant, anti-inflammatory and antibacterial activities of Diacerein. Journal of Molecular Structure. 2025 Aug 25; 1338:142284.
10. Arshad S, Qureshi IW, Waheed H, Hussain M. Mitochondrial Genome Dataset of *Drosophila melanogaster* Meigen, 1830 (fruit fly) from Pakistan. Data in Brief. 2025 Dec 30:112417.
11. Naz S, Kayani HA, Jamil I, Nadeem F, Qadir RA, Qadir SA. Synergistic enhancement of Cannabis sativa L. In vitro growth, metabolite production, and antioxidant activity using silver nanoparticles and plant growth regulators. Plant Cell, Tissue and Organ Culture (PCTOC). 2025 Oct; 163(1):8.
12. Farhan T, Amin F, Amin R, Mahmood SJ, Farooqui WA, Zafar MS, Kumar N. Evaluating the physicomechanical characteristics of cetylpyridinium chloride-modified resin-based dental composites following short-and medium-term storage regimes: an in-vitro study. BMC Oral Health. 2025 Dec 6.

13. Hanif MI, Bari MF, Hussain M, Khan N, Hossain N, Quraishy MS, Kirmani S. Integrating genetics into medical curriculum: evaluating a dedicated clinical genetics module at Dow University of health sciences. BMC Medical Education. 2025 Dec; 25(1):1-7.
14. Ishrat U, Khan S, Baig MS, Fleming J, Bi L, Ali S. Comparison of interferon gamma release assays and tuberculin skin test performance for diagnosing Mycobacterium tuberculosis infection in the Pakistani population. Scientific Reports. 2025 Oct 14; 15(1):35788.
15. Zaki S, Kayani HA, Ejaz U, Alorabi M, Alanazi AK, Naz S, Sohail M, Abideen Z. Enzymatic saccharification of Typha domingensis biomass: optimization and structural analysis. BMC biotechnology. 2025 Dec 25.
16. Ahmed I, Javed U. Innovative PVA-kaolin-thyme composite: synthesis, hemostatic efficiency, and antimicrobial properties. Polymer Bulletin. 2025 Jun 10:1-20.
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20. Tahir W, Fatima SM, Moin SF, Moin M, Waheed H. Datura alba seed proteins effect on snake venom enzymes with antioxidant and antibacterial activities. Journal of Taibah University Medical Sciences. 2025 Feb 13;20(1):81.
21. Tahir W, Fatima SM, Moin SF, Moin M, Waheed H. Datura alba seed proteins effect on snake venom enzymes with antioxidant and antibacterial activities. Journal of Taibah University Medical Sciences. 2025 Feb 13;20(1):81.
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1. *Pseudomonas aeruginosa* strain NMA53 chromosome, whole genome shotgun sequence. Muhammad, A.N., Ilyas, F., Omer, S.M., **Waheed, H**., Moin, S.F., **Hussain, M.** and Jabeen, N. ACCESSION JBYFBQ010000001
2. *Wolbachia pipientis* strain WMelANU-1 chromosome, complete genome. Parveen,I., Arshad, S., **Waheed, H**., Jabeen, N. and **Hussain, M**. ACCESSION CP200029.
3. *Drosophila melanogaster* strain ANU-1 mitochondrion, complete genome. Arshad, S., Qureshi, I. W., Amanullah, A., **Waheed, H.,** Quraishy, S. **and Hussain, M.** ACCESSION OR555819.

RESEARCH GRANTS AWARDED TO DCoB FACULTY

1. Investigating biomarkers of Hydroxyurea and Thalidomide treated transfusion dependent and independent Beta Thalassemic Patients
2. Transcriptomics analysis of preterm babies
3. Modelling colorectal carcinoma in *Drosophila melanogaster* via CRISPR-Cas9 gene editing and RNA interference
4. Successful Conduction of Trials of Developed Poultry Vaccines against New Castle Disease, 2025
5. Comparative Proteomic, Biochemical and Pharmacological Profiling of *Echis carinatus* Venom from Ecologically Different Locations of Pakistan, VCSFI-2025
6. Synthesis and Evaluation of Potential Anticancer Activity of Raloxifene Loaded pH Sensitive Liposomal Formulation against Triple Negative Breast Cancer, VCSFI-2025
7. Transcriptomic Profiling of Inherited and Familial Breast Cancer Patients to Investigate the Downstream Impact of Germline Mutations Identified in Pakistani Cohort, VCSFI-2025
8. Evaluation of Phycocyanin Production in Locally Isolated Cyanobacteria strains and Optimization of Yield *via* Design of Experiments, VCSFI-2025
9. Investigating germline mutations in early onset breast cancer patients in Pakistan, Sindh HEC Grant -2025
10. "Development & Genetic Characterization of Amelogenesis Imperfecta Model in *Drosophila melanogaster*", Sindh HEC Grant 2024-2025.
11. “Quest for Genetic Elements Influencing Outcome of Traumatic Brain Injury using Drosophila melanogaster as Model Organism”, (VCSFI-2024), Dow University of Health Sciences, Karachi-Pakistan.
12. “Whole Genomic Sequencing, Annotation and Propagation of Wolbachia isolated from Drosophila melanogaster ANU-1”, (VCSFI-2024), Dow University of Health Sciences, Karachi-Pakistan.
13. "Cobra’s & Russell’s Viper Venom Neutralization by Biofabrication of Titanium Oxide Nanoparticles", Sindh HEC Grant 2024.
14. “In-vitro Study on Big Four Snake Venom Activity Inhibition by bio-fabricated Silver and Titanium Oxide Nanoparticles”, (VCSFI-2024), Dow University of Health Sciences, Karachi-Pakistan.

15. "Configuration of a Recombinant Uricase Expression System via Genetic Engineering Employing Variance in Uricolytic Activity and Stability", (VCSFI-2024), Dow University of Health Sciences, Karachi-Pakistan.

16. "Evaluate the Antioxidant, Anti-Inflammatory, and Antidiabetic Potential of *Cannabis sativa* L. In Vitro Cultures", (VCSFI-2024), Dow University of Health Sciences, Karachi-Pakistan.

17. "Role of Inflammation and Oxidative Stress in Development of Mycobacterium Tuberculosis Infection in Type II Diabetes Mellitus Patients in Karachi", (VCSFI-2024), Dow University of Health Sciences, Karachi-Pakistan.

18. Novel Gelatin Nanoparticles for efficient and enhanced Anti- Inflammatory Therapy: Formulation, Characterization and Biological Assessment", (VCSFI-2024), Dow University of Health Sciences, Karachi-Pakistan.

19. Cannabis Derived Bioactive Molecules, Funded by Swiss Pharmaceuticals (Pvt) Ltd. (August 2024)

20. Attenuation of NLRP3 Inflammasome Pathway in Human Synovial Cells using Ticagrelor Nano-formulation. Funded by Vice Chancellors' Seed Funding (VCSFI-2023), Dow University of Health Sciences, Karachi-Pakistan.

21. Green Synthesis of Silver (Ag) Nanoparticles from *In-vitro* Propagated *Cannabis sativa L*. Cultures: Characterization and Exploring the Therapeutic Potential in Animal Model of Neurodegenerative Disorders. Funded by Vice Chancellors' Seed Funding (VCSFI-2023), Dow University of Health Sciences, Karachi-Pakistan.

22. Whole Genome Sequencing of Microbiota of *Drosophila*, GetGenome, UK.

23. Establishment of Cost-effective Platform for Screening Toxicity of Snake Venom using Drosophila melanogaster. Funded by Vice Chancellors' Seed Funding (VCSFI-2023), Dow University of Health Sciences, Karachi-Pakistan.

24. Production and Recovery of Citric Acid from Indigenously Isolated *Aspergillus niger*. Funded by Vice Chancellors' Seed Funding (VCSFI-2023), Dow University of Health Sciences, Karachi-Pakistan.

25. BioRaff-Spray wound with Sprite. Funded by Vice Chancellors' Seed Funding (VCSFI-2023), Dow University of Health Sciences, Karachi-Pakistan.

26. UNESCO Green chemistry Research Grant on Development of biodegradable composite food packaging film infused with bioinspired nanoparticles and its utilization in increasing the shelf life of climacteric fruits, June 2023.

27. "Novel approach to combat antimicrobial resistant fungal infections by epigenetic regulation; Expression profiling of histone deacetylases and screening of novel deacetylases inhibitors as potential therapeutic agents for antifungal resistant *C.albicans* infection. Research grant, Awarded by Health Research Institute (HRI), National Institute of Health (NIH) Grant No: SG/22/R3-20/RDC/1640. (1.8 million PKR-Dated: 14-04-2023).

28. Polymorphism in IFN-γ and IL-10 genes and risk of Mtb infection in type II diabetes patients in Karachi, Pakistan. Research grant, Awarded Health Research Institute (HRI), National Institute of Health (NIH). Grant No: SG-22/R3-27/RDC/DUHS/2025. (2 million PKR 1.5Yr-Dated: 25-05-2023).

29. "Development of Dow Fly Research Lab and Stock Center", Funded by Dow University of Health Sciences (1.4 million PKR).

30. "Poultry Vaccine against Ranikhet, Bird Flu and Gumboro using Indigenous Viral Strain" Funded by Funded by Dow University of Health Sciences (3 million PKR).

31. "In-Vitro and in-Vivo Studies of Camel Milk Proteins and Peptides - A Potential Therapeutic Approach towards Liver Cirrhosis", Awarded by International Foundation for Science (IFS), Swedon.

32. "Small Variations for Big Changes", Awarded by European Society for Evolutionary Biology (ESEB), UK.

33. "Screening COVID-19 Vaccinated and Unvaccinated Population for Hematological Markers, Awarded by Loyola University, Chicago-USA.

34. "Development of Thrombosis Model for Screening of Antithrombotic Drugs", Awarded by Loyola University, Chicago-USA

35. "Demonstration and Promotion of a Series of Tuberculosis Treatment and Prevention Products", Awarded by Institute of Biophysics-Chinese Academy of Sciences (IBP-CAS), China.

36. "Development of Pilot Scale System for Phycoremediation of Textile Effluent with Concomitant Production of Algal Biomass", Awarded by Higher Education Commission, Pakistan.

37. "Development of Raloxifene-Loaded Self-Nanoemulsifying Drug Delivery System (SNEDDS) with Enhanced Bioavailability Potential: A Therapeutic Implication in Osteoporosis", Awarded by Higher Education Commission, Pakistan.

38. "Evaluation of Anti-Rheumatic Potential of Ticagrelor in Rheumatoid Arthritis Fibroblast-like Synoviocytes via Modulation of NLRP3 Inflammasome", Awarded by Higher Education Commission Sindh, Pakistan.

39. "Error Rate and Coefficients Quantification of Neurological Defects due to Consanguineous Mating using *Drosophila melanogaster* Model", Awarded by Vice Chancellors' Seed Funding Initiative (VCSFI), Karachi, Pakistan

40. "Development of *Drosophila melanogaster*-Based Assay System for Screening of Carcinogenic Compounds", Awarded by Vice Chancellors' Seed Funding Initiative (VCSFI), Karachi, Pakistan.

41. "Isolation, Purification and Characterization of Bioactive and Anti-cancerous Small Molecules from *Oxalis corniculate*", Awarded by Vice Chancellors' Seed Funding Initiative (VCSFI), Karachi, Pakistan.

42. "Osteoinductive Potential of Selenium Nanoparticles via Regulation of Oxidative Stress in Human Umbilical Cord Derived-Mesenchymal Stem Cells: A Promising Therapeutic Approach in Bone Disorders", Awarded by Vice Chancellors' Seed Funding Initiative (VCSFI), Karachi, Pakistan.

43. "*In-vitro* Propagation and Enhanced Cannabinoids Production of *Cannabis sativa* L. (Industrial Hemp)", Awarded by Vice Chancellor's Seed Funding Initiative (VCSFI), Karachi, Pakistan.

44. "Investigating Protein Interaction of Cancer Associated Ubiquitin Specific Proteases", Awarded by Higher Education Commission, Pakistan.

45. "Establishment of high cell density culture of *Sacchromyces boulardii* and scale up using bench scale bioreactor": Demonstration of lab scale probiotic production", Awarded by Higher Education Commission, Pakistan.

46. "Development of first Commercial scale citric acid production plant in Pakistan by submerged fermentation of *Aspergillus niger* using cane molasses as raw material; A milestone yet to be achieved", Awarded by Higher Education Commission, Pakistan.

47. "Hemicellulosic furfural production from sugarcane bagasse", Awarded by Higher Education Commission, Pakistan.

48. "Plantation drive for *Moringa olifera* (Sohanghna) plant across university campus and awareness campaign regarding its nutritional and medicinal value", Awarded by Higher Education Commission, Pakistan.

49. "Mass production of commercially important micro algae through distillery effluent and selection of specific algal strains", Awarded by Pak Ethanol (PVT) Limited, Pakistan.

INTERNATIONAL INSTITUTIONAL LINKAGES

Dow College of Biotechnology has strong collaborative research links with universities around the world. The numbers are growing each year.

- Loyola University, USA
- Chapman University, USA
- Niversite de Lausanne Hospital Opthalmique Jules-Gonin Lausanne, Switzerland
- Department of Pathology and Immunology PATIM, University of Geneva, Switzerland
- Universiti Malaysia Pahang (UMP), Malaysia
- RHnanopharmaceuticals, USA
- Universite de Lausanne Hospital Opthalmique Jules-Gonin Lausanne, Switzerland
- Department of Pathology and Immunology PATIM, University of Geneva, Switzerland
- Centre Hospitalier Universitaire Vaudois (CHUV), Switzerland
- Ajman University, UAE

NATIONAL INSTITUTIONAL LINKAGES

Dow College of Biotechnology has also established scientific collaborations with various national institutes and universities.

- Swiss Pharmaceuticals (Pvt) Ltd
- Sindh Institute of Animal Health (SIAH)
- Usman Institute of Technology (UIT)
- International Center for Chemical and Biological Sciences (ICCBS), University of Karachi
- Shaheed Benazir Bhutto Women University (SBBWU), Peshawar
- Z.H.Z Centre of Proteomics, University of Karachi
- Institute of Sustainable Halophyte Utilization (ISHU), University of Karachi
- Dr. A. Q. Khan Institute of Biotechnology and Genetic Engineering (KIBGE), University of Karachi
- Jinnah University for Women, Karachi
- Shaheed Zulfikar Ali Bhutto Institute of Science and Technology (SZABIST)
- Pakistan Space and Upper Atmosphere Research Commission (SUPARCO)

INTERNSHIP PLACEMENT FOR DCoB STUDENTS

An HEC-mandated internship of (03) credit hours has been arranged for all 3rd year BS Biotechnology students (n = 100) during 1st July 2026 to 15thAugust 2026. The students will undergo six weeks of placement in different institutes to gain practical training and field-based experience.

List of Institutes:

- Macter International Limited
- Swiss Pharmaceuticals Pvt. Ltd
- Scientech
- National Center for Proteomics (NCP), University of Karachi
- Dow Institute of Advance & Animal Research (DIABAR)
- Dow Institute of Biological, Biochemical & Pharmaceutical Sciences (IBBPS)
- Dow Research Institute of Biotechnology and Biomedical Sciences (DRIBBS)
- One Health Diagnostic & Research Laboratory (MAS)

FUTURE PROSPECTS

BS Biotechnology opens a wide range of career opportunities due to the multidisciplinary nature of the program. Globally, Biotechnology is an emerging field of science with an ever-increasing demand for biotechnology graduates. The past two years of the COVID-19 pandemic have profoundly demonstrated the importance of Biotechnology. The curriculum of BS Biotechnology at Dow College of Biotechnology would put students in a strong position in the market for careers not only in Biotechnology in general but concomitantly in Genetic Engineering, Cell & Molecular Biology, Stem Cell Therapy and Regenerative Medicine, Biochemistry, Molecular Genetics, Microbiology, Molecular Diagnostics, and Bioinformatics. Research and development opportunities are also available to BS Biotechnology graduates, not only in hospitals and public health laboratories, but also in major pharmaceutical, food, and agricultural industries.

Students graduating from this program will be prepared for jobs that involve developing breakthrough products through research and development. The BS Biotechnology graduates could comfortably find their niche in industries where technologies are in development and/or in application and to combat debilitating and rare diseases, reduce environmental footprint, alternate

energy sources, cost-effective and ecofriendly industrial manufacturing processes. Additionally, a BS Biotechnology degree may also be useful for careers in Ecology, Forensic Medicine, Science Writing, and Environmental Science.

Many students who have graduated from Dow College of Biotechnology have secured positions at esteemed research institutions and industries, both in Pakistan and abroad. Their career paths encompass various sectors, including research and development, drug manufacturing, quality control, and academia. This success is a testament to the college's comprehensive educational programs and strong industry connections that enable students to meet the challenge of dynamically evolving academia and industry, once graduated.

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(Sample of Affidavit should be on Rs. 100 stamp paper)

AFFIDAVIT

I, _____ S/o, D/o, am offered admission in BS Biotechnology Program at Dow College of Biotechnology, Dow University of Health Sciences Karachi, hereby undertake that:

1. All my documents statement and particulars are true to the best of my knowledge. In case these are found false/ incorrect, I will be liable to refusal of my admission in "BS Biotechnology Program" by the university and if admitted would be liable to expelled from institute at any time during the course undertake that I will not get admission in any other college / university of Pakistan during this 04 years period.
2. I also hereby undertake that I have been informed about the fee structure for program and duly accepted by me. I will submit the prescribed fee within due dates and will not ask for any concession/waiver/relief in fee till the completion of the program.
3. I also undertake that after my final selection/provisional admission in BS Biotechnology program, I shall complete the program of five years. However, if I leave the seat before completion of program, I shall be liable to pay the penalty fee as per university rules and regulations for wasting the precious seat, else I will not be entitled to issuance any certificate/ document from the institution.
4. I also undertake that I hold PRC & domicile of Sindh Province only. In case of my domicile is found fake, my admission will be cancelled with immediate effect.
5. I also undertake that I will abide by all the rules and regulations of the university. If I fail to observe the discipline of university at any time during the program, the disciplinary action could be taken by the university authorities.

In case of violation of any of the above said rules / regulations, the DUHS has the full right to cancel my admission and will have no legal bindings upon DUHS.

_____
Candidate Signature
Candidate Name_____
CNIC No.:_____

Witness 01:
Name:_____
Signature:_____
CNIC No.:_____

Witness 02:
Name:_____
Signature:_____
CNIC No.:_____