Rawalpindi Medical University

PhD Program
in
Microbiology
And Molecular Biology

(2020)

Contents

Introduction to the University

Rawalpindi Medical College was established in Faisalabad on 18th March 1974 and later shifted to Rawalpindi on 5th November 1974 in an incomplete building at Tipu Road (Science block of Gordon College Rawalpindi), that was later handed over to Rawalpindi Medical College.

The founder principal of RMC, Prof. Abdul Latif, worked hard to establish the institution. First Rawalian Principal, Prof. Mohammad Umar after taking over the office in 2013, started working on multi-dimensional approach to further develop the institution.

Since 1974 more than 7900 students have graduated and are serving nationally and internationally. RMC was privileged to claim top positions in university examination several times. Best of the best graduate in UHS is also a Rawalian.

Because of the untiring and dedicated efforts of Prof. Muhammad Umar Rawalpindi Medical College was upgraded to Rawalpindi Medical University recently by Government of Punjab, Health Department on 6th may 2017. Higher Education Commission has given NOC to RMU.

The institute has strived to be upgraded to the level of an independent University after which the annual system of MBBS degree has been changed to the internationally preferred modular system. Now after the successful launching of MD/MS program by VC RMU we are struggling hard to get the M.Phil and Ph.D program approved.

RMU Mission Statement:

- To impart evidence-based research oriented medical education
- To provide best possible patient care
- To inculcate the values of mutual respect and ethical practice of medicine

Vision and Values

Highly recognized and accredited center of excellence in Medical Education, using evidence-based training techniques for development of highly competent health professionals.

Introduction to Pathology Department

A dynamic and rapidly evolving field, Pathology is the study of disease, or more generally, the study of the biological response to adverse conditions. As an intellectual discipline, Pathology bridges basic and clinical sciences. The Department of Pathology at Rawalpindi Medical University is a large multi-disciplinary department. Our diverse faculty teaches in different phases of MBBS and BSc undergraduate programs as well as engaged in post-graduate training in various specialties of pathology. Our goal is to advance our fundamental understanding of the pathology and the patho-physiologic mechanisms of disease, and to bring this knowledge to others through teaching and publication.

Department of Pathology, Rawalpindi Medical University is offering an ongoing M. Phil Program in Microbiology in affiliation with University of Health Sciences, Lahore since 2007. Apart from post graduate institutes, RMC was the first Government Medical College in Punjab to have started an ongoing M.Phil program in affiliation with University of Health Sciences.

We have three well established diagnostic Microbiology Laboratories in three RMU allied hospitals i.e. Holy Family Hospital, Benazir, Bhutto Hospital and District Headquarters Hospital. Infection control program is well established in three allied hospital setups of RMU which is headed by expert infection control committees under supervision of Prof. Dr. Naeem Akhtar and are very fruitful for M. Phil students and all staff members of hospitals and the patients at large.Keeping in view the persistent demand from students and urgent need for experts in the field of laboratory sciences, it is highly imperative to initiate PhD program in this field. To establish PhD program, the main areas to be focused are:

- PhD Faculty
- Infrastructure
- Specialized Equipment

Faculty in Pathology

Sr. #	Name	Designation	Qualification
1	Prof. Naeem Akhtar	Professor of Pathology	MBBS, PhD (Micro)
2	Prof.Mobina Ehsan Dodhy	Professor of Pathology	MBBS, FCPS (Haem)
3	Dr. Nadeem Ikram	Associate Professor	MBBS, MCPS, M. Phil, FCPS (Haem)
4	Dr. Shireen Rafiq	Assistant Professor	MBBS, M. Phil, PhD (Micro)
5	Dr. Fatima-tuz-Zuhra	Assistant Professor	MBBS, M. Phil (Chem)
6	Dr. Kiran Fatima	Assistant Professor	MBBS, M. Phil (Micro)
7	Dr. Tayyaba Ali	Assistant Professor	MBBS, FCPS (Histo)
8	Dr.Huma Amin	Assistant Professor	MBBS, MPhil (Haem)
9	Dr. Sofia Khursheed	Pathologist	MBBS, MPhil (Histo)
10	Dr. Aasiya Niazi	Assistant Professor	MBBS, FCPS (Histo)
11	Dr. Amber Habib	Pathologist	MBBS, MCPS, M. Phil (Micro)
12	Dr. Mirza Tariq Baig	Pathologist	MBBS, DCP
13	Dr. Rabia Anjum	Pathologist	MBBS, M. Phil (Micro)
14	Dr. Raana Zeshan	Pathologist	MBBS, FCPS (Heam)
15	Dr. Kausar Izhar	PWMO	MBBS, MCPS
16	Dr. Imran Habib	APMO	MBBS
17	Dr. Muhammad Khalid Javaid	Sr. Demonstrator	MBBS, MCPS (Path) MPH
18	Dr. Abid Hassan	Sr. Demonstrator	MBBS
19	Dr. Saeed Lehrasab	Sr. Demonstrator	MBBS
20	Dr. Syed Muhammad Ali	Sr. Demonstrator	MBBS, CMT
21	Dr. Syeda Fatima Rizvi	Sr. Demonstrator	MBBS, M. Phil (Micro)
22	Dr. Fariha Sardar	Sr. Demonstrator	MBBS, FCPS (Heam)
23	Dr. Iqbal Haider	Sr. Demonstrator	MBBS
24	Dr. Mehreen Fatima	Demonstrator	MBBS, M. Phil (Histo)
25	Dr. Syeda Aisha	Demonstrator	MBBS
26	Dr. Nida Fatima	Demonstrator	MBBS
27	Dr. Rabbia Khalid	Demonstrator	MBBS, M. Phil (Haem)
28	Dr. Unaiza Aslam	Demonstrator	MBBS

Faculty in Biochemistry

Sr. #	Name	Designation	Qualification
1	Dr. Tehmina Qamar	Associate Professor	MBBS, FCPS (Biochemistry)
2	Dr. Aneela Jamil	Assistant Professor	MBBS, FCPS (Biochemistry)
3	Dr. Amina Arif	Assistant Professor	MBBS, MPhil (Biochemistry)
4	Dr. Kasif Rauf	Senior Demonstrator	MBBS, MPhil (Biochemistry)

Faculty in Microbiology & Molecular Biology

We have the following worthy experts who are PhD in Microbiology and Molecular Biology/ Biochemistry.

1. **Professor Naeem Akhtar – MBBS (Pb.), Ph.D Microbiology (Sheffield, UK)**
   Chairman Department of Pathology
   Dean Basic Sciences & Diagnostics,
   RMU & Allied Hospitals, Rawalpindi.

   He did his MBBS from RMC in 1985 and PhD in Microbiology from University of Sheffield, UK in 1992 and has supervised seven PhD students, two for University of Health Sciences, Lahore and five for Quaid-e-Azam University, Islamabad. These students have been awarded with their degrees.

2. **Dr. Shireen Rafique - MBBS, M. Phil, Ph.D Microbiology (QAU)**
   Principal Women Medical Officer
   Benazir Bhutto Hospital, Rawalpindi
   She did her MBBS from RMC in 1985 and PhD in Microbiology from Quaid-e-Azam University, Islamabad in 2014.

3. **Dr. Amna Noor – PhD Biochemistry/ Molecular Biology (QAU)**

4. **Dr. Asma Nafisa - PhD Biochemistry –Biochemist (Pir Mehar Ali Shah Arid Agriculture University, Rawalpindi(Degree Awaited)**

Adjunct Faculty

Dr. Muhammad Barkaat Hussain- MBBS, M.Phil, Ph.D Microbiology
Assistant Professor of Microbiology
Department of Microbiology, Rabigh Medical College
King Abdul Aziz University, Kingdom of Saudi Arabia.
He has been included as visiting/adjunct faculty for PhD Microbiology Program.

Other Faculty Members in Microbiology

Dr. Kiran Fatima
M.B.B.S.,M.Phil (Microbiology)
Assistant Professor,
Pathology Department, RMU

Dr. Amber Habib
M.B.B.S,MCPS, M.Phil (Microbiology)
Consultant Pathologist,
Holy Family Hospital, Rawalpindi

Dr. Rabia Anjum
M.B.B.S.,M.Phil (Microbiology)
Consultant Pathologist,
Benazir Bhutto Hospital, Rawalpindi

Dr. Syeda Fatima Sughra Rizvi
M.B.B.S.,M.Phil (Microbiology)
Senior Demonstrator,
Rawalpindi Medical University, Rawalpindi

Infrastructure

The Department of Pathology, RMU & Allied Hospitals has well equipped laboratories, catering to the educational needs of the postgraduate and undergraduate students as well as providing quality diagnostic services to the community. We have well equipped diagnostic laboratories in all of our RMU Allied Hospitals which are already recognized for training in M.Phil (Microbiology), FCPS (Hematology), FCPS (Histopathology) and MCPS (Clinical Pathology, with a number of post-graduate trainees present in different specialties.

The facilities present in Pathology Department at RMU Campus include

- **Laboratories:**
    - Postgraduate Research Laboratory for Microbiology
    - Postgraduate Research Laboratory for Molecular Biology
    - Undergraduate Laboratory
- **Lecture Halls:** 02 with seating capacity of300 students per hall
- **Chairperson's Room** 01
- **Female Staff Room** 01
- **Male Staff Room** 01
- **Conference Room** 01
- **Seminar Room** 01
- **Support Staff Room** 01
- **Departmental library** present with 700 books approximately & 1000 microscopic slides approximately

The attached tertiary care teaching hospitals of the Rawalpindi Medical University include:

1. Holy Family Hospital.
2. Benazir Bhutto Hospital.
3. District Headquarters Hospital.

The pathology laboratories in the attached teaching hospitals have basic as well as advanced facilities for the research work as well as patient care. Some of the advanced facilities available in our teaching hospital microbiology laboratories include

- ***BSL-II Laboratory with BSL-III Safety Cabinet, Holy Family Hospital,***
- ***BSL-lll in Benazir Bhutto Hospital***
- ***PCR Laboratories***
- ***Gene-Xpert & MGIT-960 systems in Mycobacteriology Labs***
- ***Serology etc.***

Each microbiology department has a collection point, well-equipped bacteriology section, sterilization room, urine R/E section, serology section, PCR lab, TB section, reporting room and classroom for postgraduate students, along with modern teaching facilities e.g. multimedia and microscope projection on LCD.

Our proposed post graduate multipurpose **University Post-graduate Research Laboratories Complex** includes laboratories for Anatomy, Physiology, Pharmacology, Forensic Medicine, Hematology, Chemical Pathology, Microbiology, Molecular Biology, Histopathology and skill laboratories. It's PC1 has been submitted to Higher Education Commission of Pakistan.

Available Facilities

List of equipment and facilities offered in our laboratories is attached herewith:

PATHOLOGY DEPARTMENT –RAWALPINDI MEDICAL UNIVERSITY

S. #	Item Name	Qty.
1	Microscope Nikon Japan	14
2	Microscope Micron China	06
3	Multi Media Projector	03
4	Portable Projection Screen	03
5	Air Conditioner Split Unit	01
6	Air Conditioner Window AC	01
7	Overhead Projector Portable	02
8	Slide Box wooden 200 slides	13
9	Slide Box wooden 100 slides	15
10	Camera (Microscope) China	01
11	Hot Air Oven	02

PATHOLOGY DEPARTMENT - HOLY FAMILY HOSPITAL

S. #	Name of Equipment	Quantity
	Media preparation room	
1	Autoclave jacketed	1
2	Weighing machine	1
3	Glass ware	
	Bacteriology /clinical pathology	
1	Safety Cabinet Class II	1
2	Incubator large (Memmert	1
3	Hot Air oven (Memmert)	1
4	Microscope (Nikon)	2
5	Refrigerator	1
6	Deep freezer s	1
7	Staining facilities	
8	Gas burners	3
9	Candle jar	1
10	Computer for reporting	1
	Serology	
1	ELISA Plate Washer(Diamet)	1
2	ELISA Reader (Diamet)	1
3	Incubator (Jouan)	1
4	Centrifuge (Hettich) 8 sockets	1
5	Deep freezer	1
6	Refrigerator	1

7	Voltage Stabilizer	1
8	PCR Lab	
9	Blast Freezer (West point)	1
10	Safety Cabinet Level- I	1
11	Rotorgene2 plex Qaigen (Corbett)	1
12	Rotor mixer	1
13	Centrifuge high Rev (Centurin)	1
14	Micro Pipettes	6
15	Computer	1
16	Printer	1
17	UPS	1
Mycobacteriology Lab		
1	Gene Xpert	1
2	Laptop	1
3	Printer	1
4	UPS	1
5	MGIT-960	1
6	LED Microscope	1
7	Inverter Split AC	1
8	Chillers (Caraval Glass Door)	1
BSL ll,BSL-Ill Lab		
1	Biological Safety Cabinet Class- Level-ll, III	1
2	Autoclave	1
3	Incubator (Memmert)	1
4	Centrifuge (Hettich)	1
5	Split AC	1
6	Refrigerator	1
7	ELISA Reader	1
8	ELISA Plate Washer	1
9	Air curtain	1
Chemical Pathology		
1	Backmen Coulter AU-480	2
2	P-500 Diatron	1
3	Cornley AF 500	2
4	Hot Air oven (Jouan)	4
5	Medica Easy ABG Analyzer	1
6	GP getein Bio tech HbA1C	1
7	Lab Way HbA1C	1
8	FIA8600 HbA1C	1
9	DMO 412 Centrifuge	1
Histopathology		
1	Staining Jars	11

2	Automatic tissue processer	1
3	Water Bath (Electric)	1
4	Paraffin embedding bath	1
5	Oven (100 C)	1
6	Microtome	1
7	Knife sharpener	1
8	Binocular Microscope	8
9	Embedding statin	1
Hematology		
1	Hematology analyzer Sysmex KX-21	2
2	Hematology analyzer Mindery -3000+	5
3	Hematology analyzer Abacus	1
4	Hb Electrophoresis	1
5	C -4 Coagulation analyzer	1
6	Centrifuge D-Lab	1
7	Microscope	2
8	Water Bath (Memmert)	1
9	Incubator (Memmert)	2
10	Abacus (hematology analyzer)	1

PATHOLOGY DEPARTMENT – BENAZIR BHUTTO HOSPITAL

S. #	Name of Equipment	Quantity
1	BSL III Lab PCR Machine (Rotor Gene)	01
2	Gene Xpert	01
3	Safety Cabinet	01
4	Media Making Machine (APS 320)	01
5	Chemistry Analyzer **Beckman Coulter (Fully Automated)**	02
6	ELISA Reader / Washer Machine (Diamed)	02
7	Urine Analyzer (DIRUI)	01
8	Incubator	02
9	Chemistry Analyzer **(Selectra XL)**	01
10	Electrolyte Analyzer	04
11	Blood Gas Analyzer **(Medica)**	03
12	Hormone Analyzer	02
13	Hematology Analyzer **(Sysmex)**	07
14	Tissue Processor (HISTOTOUCH III)	01
15	Microtome (Lieca)	01
16	Centrifuge	
17	Microcentrifuge	01
18	Weighing Balance	01
19	Digital balance	01
20	Hot Air Oven	01

PATHOLOGY DEPARTMENT – DISTRICT HEADQUARTERS HOSPITAL

S. #	Name of Equipment	Quantity
1	Chemistry Analyzer **Beckman Coulter(Fully Automated)**	01
2	Chemistry Analyzer **(Selectra E)**	01
3	Electrolyte Analyzer	01
4	Blood Gas Analyzer **(Medica)**	01
5	CHEMISTRY ANALYZER **(Selectra Pro M)**	01
6	Hematology Analyzer **(Sysmex)**	04
7	Hematology Analyzer **(Mindray)**	01
8	ELISA Reader / Washer Machine (**Diamate)**	02
9	Centrifuge machine	03
10	Electronic balance	01
11	Water bath	01
12	Semi-automated chemistry analyzer **MICROLAB-300**	01
13	Gene expert. MTB/RIF	01
14	PCR Machine (Rotor Gene)	01
15	Safety cabinet	01
16	Incubator	01
17	Hot air oven	01
18	Autoclave	01

Patient Care Activities

AVERAGE NO. OF TESTS PERFORMED IN PATHOLOGY DEPARTMENT PER MONTH DURING 2018

SECTIONS	HFH (Per Month)	BBH (Per Month)	DHQH (Per Month)	TOTAL (Per Month)
HAEMATOLOGY	93525	13,737	13023	120285
CHEMICAL PATHOLOGY	51930	29,448	21357	102735
MICROBIOLOGY	9701	3,757	221	13679
BIOPSIES	552	516	15	1083
GROSS TOTAL/AVERAGE TESTS PER MONTH	**155708**	**47458**	**34616**	**237782**

ROLE OF PATHOLOGY DEPARTMENT IN HOSPITAL INFECTION PREVENTION & CONTROL

Infection Control Surveillance Rounds				
Sr. No.	**Month**	**Surveillance Rounds Conducted**		
		Holy Family Hospital	**Benazir Bhutto Hospital**	**District Headquarters Hospital**
1	January	12	16	16
2	February	12	16	16
3	March	16	18	16
4	April	32	16	16
5	May	20	16	16
6	June	16	16	16
7	July	20	16	16
8	August	20	16	16
9	September	16	16	16
10	October	20	19	16
11	November	20	17	16
12	December	24	16	16
	Total	208	198	192

Infection Prevention & Control Training Sessions				
Sr. No.	**Month**	**Training Sessions Conducted**		
		Holy Family Hospital	**Benazir Bhutto Hospital**	**District Headquarters Hospital**
1	January	4	4	3
2	February	4	4	3
3	March	4	3	2
4	April	4	3	2
5	May	4	4	2
6	June	4	4	4
7	July	4	4	5
8	August	4	4	4
9	September	4	4	4
10	October	4	3	4
11	November	4	3	3
12	December	4	1	3
	Total	48	41	39

Infectious Waste Disposal				
Sr. No.	**Month**	**Hazardous Waste Disposed Off (Kgs)**		
		Holy Family Hospital	**Benazir Bhutto Hospital**	**District Headquarters Hospital**
1	January	6708	4900	1083
2	February	8640	3839	832
3	March	5851	4491	957
4	April	6910	4697	1024
5	May	5023	5114	969
6	June	5167	4414	753
7	July	5736	4610	736
8	August	5955	4546	709
9	September	7343	4078	904
10	October	6815	4706	642
11	November	4105	4872	673
12	December	2748	4983	654
	Total	71001	55250	9918

Promotion of Hand Sanitizers Use				
Sr. No.	**Month**	**Hand Sanitizers Used (in Liters)**		
		Holy Family Hospital	**Benazir Bhutto Hospital**	**District Headquarters Hospital**
1	January	73.5	50	159
2	February	64.5	50	167
3	March	92.5	70	324
4	April	86	54	63
5	May	89	223	119
6	June	62	259	101
7	July	113	137	50
8	August	87	248	82
9	September	76.5	192	130
10	October	96.5	224	172
11	November	93.5	89	93
12	December	88	100	Nil
	Total	1022	1696	1460

Promotion of PPE Use - BBH								
Sr. No.	**Month**	**Sterilized Gloves**	**Gloves Box**	**Face Mask**	**Cap**	**Gown**	**Shoe Cover**	**Goggles**
1	January	8550	775	26400	12800	Nil	32400	Nil
2	February	8400	865	18150	9100	Nil	27000	Nil
3	March	7450	1039	20400	10900	Nil	14800	Nil
4	April	6950	1031	12450	10100	Nil	27800	Nil
5	May	8150	1063	21000	7600	Nil	24800	Nil
6	June	9150	810	15500	8600	Nil	18500	Nil
7	July	7900	939	15700	9000	Nil	2100	Nil
8	August	7400	909	16750	8500	2	26100	2
9	September	8900	785	16700	4600	4	24400	Nil
10	October	13050	928	19200	11600	Nil	27600	Nil
11	November	10850	637	22200	8800	4	24000	2
12	December	11500	792	19000	8000	Nil	31800	Nil
	Total	108250	10573	223450	109600	10	281300	4

Promotion of PPE Use - DHQ								
Sr. No.	**Month**	**Sterilized Gloves**	**Gloves Box**	**Face Mask**	**Cap**	**Gown**	**Shoe Cover**	**Goggles**
1	January	18000	Nil	13100	6800	Nil	12700	Nil
2	February	7550	576	15150	12200	Nil	1500	Nil
3	March	5000	838	17600	3400	Nil	15800	Nil
4	April	13000	736	16150	11400	Nil	13900	Nil
5	May	12600	936	18300	29800	Nil	5500	Nil
6	June	14200	1011	18500	5200	Nil	9200	Nil
7	July	9600	736	13950	13300	Nil	11500	Nil
8	August	8700	945	9100	12400	Nil	12900	Nil
9	September	10100	936	16300	6600	Nil	5800	Nil
10	October	7500	850	22000	6500	Nil	10900	Nil
11	November	9900	737	20350	12300	Nil	9200	Nil
12	December	8700	636	20900	9600	Nil	9000	Nil
	Total	108650	8637	201400	129500	Nil	109800	Nil

Research & CME Activities of The Pathology Department

Research Activities Conducted Under The Supervisor

PhD Awarded

1. Co-supervisorfor Dr. Shamim Mumtaz, Professor of Microbiology, Department of Pathology, Islamabad Medical & Dental College, Islamabad. PhD Research Project entitled **"***Beta-lactam antibiotic resistance patterns and its development in indigenous clinical isolates" (**PhD degree awarded 2008 by Quaid-i-Azam University, Islamabad**)*

2. Co-supervisorfor Dr. Rukhsana Firdous, Assistant Professor of Microbiology, Department of Pathology, Rawalpindi Medical College, Rawalpindi. PhD Research Project entitled *"Evaluation of resistance to fluoroquinolones in clinical isolates of Escherichia coli, Staphylococcus aureus, and Pseudomonas aeruginosa" (**PhD awarded Jan 2010 by Quaid-i-Azam University, Islamabad**)*

3. Co-supervisorfor Mr. M. Arafat Yameen, Assistant Professor, COMSATS Institute, Abbotabad. PhD Research Project entitled *"Study on Methicillin-resistant Staphylococcus aureus and Vancomycin-resistant Enterococcico-colonization in patients of Intensive care Units of Tertiary Health Care facilities (Hospitals)" (**PhD awarded Oct 2011 by Quaid-i-Azam University, Islamabad**)*

4. Supervisorfor Dr. Muhammad Barakaat Hussain, Department of Microbiology,University of Health Sciences, Lahore. PhD Research Project entitled *"Screening of Pakistani Honeys for Antibacterial Potential against Salmonella typhi". (**PhD awarded Aug 2012by University of Health Sciences, Lahore**)*

5. Supervisor for Dr. Sidra Saleem, Assistant Professor, Department of Microbiology,University of Health Sciences, Lahore.PhD Research Project entitled *"Efficacy of Honey against methicillin resistant Staphylococcus aureus systemic infection in mouse model".(**PhD awarded Aug 2013by University of Health Sciences, Lahore**)*

6. Co-supervisorfor Mrs. Ayesha Aslam, PhD Research Project entitled *"Prevalence of different candida species isolated from patients from ICU-*

settings of tertiary-care hospitals and their antifungal susceptibility pattern" ***(PhD awarded Sep 2016 by Quaid-i-Azam University, Islamabad)***

7. Supervisor for Mrs. Saira Erum. PhD Research Projectentitled *"In vitro antibacterial activity of zinc nanoparticles against clinical isolates of methicillin-resistant Staphylococcus aureus (MRSA)"* Quaid-i-Azam University, Islamabad ***(PhD awarded Apr 2017 by Quaid-i-Azam University, Islamabad)***

Research work for following <u>MPhil students in Microbiology</u> at Quaid-i-Azam University, Islamabad carried out under my supervision

M.Phil Awarded

1. Miss Hina Nasim Khan. MPhil Research Project entitled *"Antibiotic resistance patterns of Methicillin-Resistant Staphylococcus aureus and Staphylococcus epidermidis".* ***(MPhil degree awarded 2008 by QAU, Islamabad)***

2. Miss Firdous Yasmin. MPhil Research Project entitled *"Antibiotic resistance patterns of Pseudomonas aeruginosa*". ***(MPhil degree awarded 2008 by QAU, Islamabad)***

3. Miss Nosheen Akram. MPhil Research Project entitled *"Prevalence of post-operative wound infections in patients with gynecological and obstetrics surgery and antibiogram of the bacteria isolated'*. ***(MPhil degree awarded 2009 by QAU, Islamabad)***

4. Miss Arsala. MPhil Research Project entitled "*Prevalence of indwelling devices related infections and antibiogram of the bacteria isolated*".***(MPhil degree awarded 2009 by QAU, Islamabad)***

5. Miss Kanwal. Research project entitled "Evaluation of frequency of MDR-tuberculosis in patients with primary pulmonary tuberculosis". (***MPhil degree awarded 2011 by QAU, Islamabad***)

Funded Research Projects

1. **Principal Investigator** in a research project entitled "*Determination of relationship of bacterial carriage by hospital staff, hospital acquired infections and antibiotic resistance patterns of bacterial isolates in a tertiary care hospital to develop hospital antibiotic po*licy" **completed in May 2008** (Funded by Department of Human Resource Development, Higher Education Commission, Islamabad, Pakistan).

2. **Principal Investigator** in a research project entitled "*Evaluation of status of antibiotic resistance patterns of mycobacteria isolated from patients with pulmonary tuberculosis to develop strategies for effective treatment of tuberculosis*" **completed in May 2013. (**Funded by Department of Research and Development, Higher Education Commission, Islamabad, Pakistan)

Completed & Ongoing Research/Post-graduate (M.Phil) Projects of Pathology Department

S. No	Title	Principal Investigator	Co-Investigator /Supervisor
01	As a part of PhD thesis variants of BCR – ABL transcript in CML Patients in chronic phase and molecular non forming of the typical transcript in Rawalpindi Region	Dr. Huma Amin	NA
02	Association of NS1antigen testing with dengue PCR in dengue fever patients Evaluation of biochemical hematological and microbiological profile of TB patients undergoing geneXpert	Dr. Naureen Saeed Dr Fatima-tuz-zuhra	Farhana Shaukat
03	Molecular Characterization of MRSA by PCR in Holy Family Hospital Rawalpindi	Dr. Syed Murtaza Ali Shah	Nil
04	Histomorphological patterns of lesions in thyroid specimen	Kainat Ali	Aasiya Niazi
05	To determine the frequency of Carba-penemasesProducing Enterobacte-riaceae using Modified Hodge Test, on Mueller Hinton agar vs. MacConkey agar amongst the admitted patients of Holy Family Hospital	Dr. Amber Habib	Prof. Dr. Abbas Hayat
06	Comparative study of Kirby Bauer's Method, MHT and Carba-NP test for detection of Carbapenemase production in Clinical Isolates of gram-negative bacteria	Dr. Saroor-i-Syma	Prof. Dr. Abbas Hayat
07	Current trends of antimicrobial resistance pattern of XDR salmonella typhi	Dr. Kiran Ahmed	Prof. Dr. Abbas Hayat

Completed & Ongoing Post-graduate (FCPS) Projects of Pathology Department

S.No.	Investigator	Study Topic	Session
01	Dr. Nida Khalid	Randomized control trial of imatinib vs nilotinib for major molecular response at 12 months in chronic phase of chronic myeloid leukemia	2015-2020
02	Dr. Ayesha Rehman	Comparison of Sokal vs Hasford score for prognosis in newly diagnosed chronic phase chronic myeloid leukemia	2015-2019
03	Dr. Maha Tariq	D-Dimers and fibrinogen in third trimester of normal pregnancy and pregnancy complicated by gestational hypertension and / or pre-eclampsia.	2016-2020
04	Dr. Fizzah Khalil	Changes in hemostatic parameters of newly diagnosed patients of chronic myeloid leukemia receiving TKI therapy	2016-2020
05	Dr. Natasha Tahir	Significance of hematological parameters and CRP in determining prognosis of acute ischemic stroke.	2018-2022
06	Dr. Munaza Abbas	Mean fibrinogen levels and its association with severity of post-partum hemorrhage	2018-2022
07	Dr. Hafsa Syed	Role of platelet count and platelet indices in the early diagnosis of pre-eclampsia in pregnancy	2018-2022

Completed & Ongoing MBBS Students Research Projects of Pathology Department

S. No	Title	Principal Investigator	Co-Investigator/Supervisor
01	Histomorphological patterns of lesions in lymph node biopsies in HFH	Sidra Bibi	Dr. Aasiya Niazi
02	Incidence of Tuberculosis in diagnostic biopsies	Shehryar khan	Dr. Aasiya Niazi
03	Frequency of Hydatidiform Mole in samples of products of conception received at HFH	Mahrosh	Dr. Aasiya Niazi
04	Comparison of frequencies of UTI in middle aged and female patients attending the medical OPD of HFH, major pathogens causing UTI and their sensitivity patterns	AmmarahAbid	Dr. Shireen Rafiq
05	Nosocomial infections, rate and causative organisms among patients of medical and surgical ICU in tertiary care hospital	Mubashara Mehmood	Dr. Shireen Rafiq
06	Comparison of MRSA colonization in nares and axilla of patients admitted to medical and surgical units of HFH	Zahra Liaqat	Dr. Shireen Rafiq
07	Nosocomial infections as a cause of high antibiotic conception and financial burden on the patients admitted in ICU of tertiary care hospital	Maria Siddique	Dr. Shireen Rafiq
08	Rate of microbial contamination in OTs of HFH before and after fumigation	Maliha Tariq	Dr. Shireen Rafiq
09	Biochemical profile among the patients of suspected MDR-TB	Ali Aslam	Dr. Shireen Rafiq
10	Assessment of derangement in renal function among pre and post dialysis patients	Saqib Iftikhar	Dr. Shireen Rafiq
11	Frequency of positivity of CSF samples received in microbiology lab of HFH	Kaleem Ullah	Dr. Shireen Rafiq
12	The pattern of ABGs abnormalities among patients of ICU	M Ismail	Dr. Shireen Rafiq
13	To determine the frequency of deranged LFTs in pregnant females diagnosed with HCV attending the antenatal unit	Ammara Ansari	Dr. Shireen Rafiq
14	Frequency of positive blood cultures and their sensitivity patterns in HFH	Ayesha Waseem	Dr. Shireen Rafiq
15	Isolation of Pseudomonas species with difference of antibiotic sensitivity pattern among critical areas of HFH	Fatima Naveed	Dr. Shireen Rafiq
16	Frequency of A1 and A2 subgroups among blood group A in donors	Raheela Afzal	Dr. Shireen Rafiq

17	Comparison of Hb and HCT of voluntary and family replacement donors	Taifah Butt	Dr. Shireen Rafiq
18	Prevalence of syphilis in blood donors by ICT	Abid Hussain	Dr. Shireen Rafiq
19	To determine the frequency of raised cholesterol and TGs level In cardiac patients admitted in CCU of HFH	Noman Hassan	Dr. Shireen Rafiq
20	Study of serum prolactin levels and its relationship with TSH in infertile women at BBH, Rwp	Sumaira Kausar	Dr. Shireen Rafiq
21	A mosaic of risk factors for female infertility in Pakistan	Dua Zehra Zaidi	Dr. Shireen Rafiq
22	Comparison of HbA1C in adult patients taking oral medications and insulin attending clinics of BBH, Rwp	M Naveed	Dr. Shireen Rafiq
23	Screening of neonatal wards to detect source of infection in pediatric population of HFH	Zainab Javed	Dr. Shireen Rafiq
24	Comparative study of ZN staining versus fluorochrome staining and impact of concentrated technique on diagnosis of TB in sputum smear	Khushboo Zafar	Dr. Shireen Rafiq
25	Contaminated equipment, source of HA infection s among patients at critical areas of HFH,Rwp	Irum Anwar	Dr. Shireen Rafiq

Research Projects of BS. Hons. (MLT) Students

S. No	Principal Investigator	Title	Status
01	Rabia Shafiq	Association of interleukin-4 VNTR polymorphism with pre-eclampsia in Pakistani population	2015
02	Zobia Syed	PCR based genotyping of KDR- gene in local recurrent miscarriage patient	2015
03	Aneeqas Qayyum Khan	Frequency of secretors and non-secretors in healthy individuals having blood groups A, B and AB	2016
04	Shahazada Uzair Mumtaz	Baseline blood parameters of Donors in tertiary care hospital	2016
05	Saima Javed	Frequency and sensitivity pattern of Acinetobacter to commonly used antibiotics in clinical specimens of patients at HFH Rawalpindi	2016
06	Farah Shafiq	Evaluation of sensitivity and specificity of different screening techniques for detection of viral hepatitis in blood donors at tertiary care hospitals	2016
07	Rabia Butt	Association of pyuria with leucocyte esterase and nitrate and their refection in urine culture	2016
08	Komal Masood	Major pathogens isolated from blood cultures and their sensitivity pattern at HFH	2016
09	Nighat Mushtaq	Molecular response rate of imatinib on BCR-ABL mRNA in patients with CML	2016
10	Mehmona Tariq	Molecular analysis of JAK-2 mutation V617F among the patients with essential thrombocythemia	2016
11	Hadika Murtaza	Frequency and sensitivity pattern of Pseudomonas aeruginosa in patients of burn unit at HFH, Rwp.	2016
12	Huma Jahangir	Sensitivity pattern of aerobic gram-negative rods in ETT and secretions of ICU patients at HFH	2016
13	Kashmala Mansoor	Determination of a sensitive and specific Red cell index in order to differentiate between β- thalassemia minor and Iron deficiency anaemia	2016
14	Wajeeha Arshad	Correlation between TLC, Neutrophil count, Gram Staining and Positivity of culture in centrifuged and un-centrifuged ascitic fluid received in HFH	2016
15	Faryal Nageen	Frequency of susceptibility pattern of ESBL producing aerobic gram-negative bacteria in post-operative infections at HFH	2016
16	Qurat-ul-Ain Zara	Pre-dominant MDR pathogens isolated from patients admitted in ICUs of HFH	2016
17	Hira Akmal	Bacterial Culture and detection of malarial parasites by ICT and microscopy method in whole blood to evaluate QC	2017
18	Shizza Tariq	Effect of inoculum standardization on zone sizes of Staphylococcus	2017
19	Samreen Sarwar	Frequency of DAT and IAT positivity in Thalassemia patients	2017

S. No	Principal Investigator	Title	Status
20	Saba Parveen	Determining frequency of weak Rh-D antigen in Rh negative blood donor in tertiary care hospitals of Rwp	2017
21	Fatima Jalil	Association and correlation of age and LFTs with HCV RNA-PCR	2017
22	Komal Shahid	Association and correlation of age and LFTs with HBV DNA-PCR	2017
23	M Ansar	Comparison of HB levels by copper sulphate method and automated hematology analyzer in blood donors	2017
24	Abdul Azim Shah	Use of HbA1C in diagnosis of diabetes mellitus	2017
25	Ammarah Abid	Comparison of frequencies of UTI in middle aged and female patients attending the medical OPD of HFH, major pathogens causing UTI and their sensitivity patterns	2018
26	Mubashara Mehmood	Nosocomial infections, rate and causative organisms among patients of medical and surgical ICU in tertiary care hospital	2018
27	Zahra Liaqat	Comparison of MRSA colonization in nares and axilla of patients admitted to medical and surgical units of HFH	2018
28	Maria Siddique	Nosocomial infections as a cause of high antibiotic conception and financial burden on the patients admitted in ICU of tertiary care hospital	2018
29	Maliha Tariq	Rate of microbial contamination in OTs of HFH before and after fumigation	2018
30	Ali Aslam	Biochemical profile among the patients of suspected MDR-TB	2019
31	Saqib Iftikhar	Assessment of derangement in renal function among pre and post dialysis patients	2019
32	Kaleem Ullah	Frequency of positivity of CSF samples received in microbiology lab of HFH	2019
33	M Ismail	The pattern of ABGs abnormalities among patients of ICU	2019
34	Ammara Ansari	To determine the frequency of deranged LFTs in pregnant females diagnosed with HCV attending the antenatal unit	2019
35	Ayesha Waseem	Frequency of positive blood cultures and their sensitivity patterns in HFH	2019
36	Fatima Naveed	Isolation of Pseudomonas species with difference of antibiotic sensitivity pattern among critical areas of HFH	2019
37	Raheela Afzal	Frequency of A1 and A2 subgroups among blood group A in donors	2019
38	Taifah Butt	Comparison of Hb and HCT of voluntary and family replacement donors	2019
39	Abid Hussain	Prevalence of syphilis in blood donors by ICT	2019
40	Noman Hassan	To determine the frequency of raised cholesterol and TGs level In cardiac patients admitted in CCU of HFH	2019
41	Sumaira Kausar	Study of serum prolactin levels and its relationship with TSH in infertile women at BBH ,Rwp	2019
42	Dua Zehra Zaidi	A mosaic of risk factors for female infertility in Pakistan	2019
43	M Naveed	Comparison of HbA1C in adult patients taking oral medications and insulin attending clinics of BBH, Rwp	2019
44	Zainab Javed	Screening of neonatal wards to detect source of infection in	2019

S. No	Principal Investigator	Title	Status
		pediatric population of HFH	
45	Khushboo Zafar	Comparative study of ZN staining versus fluorochrome staining and and impact of concentrated technique on diagnosis of TB in sputum smear	2019
46	Irum Anwar	Contaminated equipment, source of HA infection s among patients at critical areas of HFH,Rwp	2019
47	KhansaKhusheed	Auditing of Hand Sanitizer in various areas of HFH, Rwp	Ongoing
48	Javeria Farooq	Use of Gene Xpert for the detection of TB cases among contacts of the patient with PTB	Ongoing
49	Tasbiha Gul	Use of Gene Xpert for Rifampicin resistance profiling in previously diagnosed patients with PTB	Ongoing
50	Madiha Gul	Role of biofilm forming bacteria(Klebsiella and Acinetobacter) causing persistent infections in critical areas of HFH	Ongoing
51	Anita Bibi	Air sampling of critical areas of HFH	Ongoing
52	Aleena Syed	Disinfectant , life savior or killer	Ongoing
53	M. Asif	Comparison of common infections in children of Day care and feeding rooms	Ongoing
54	Naima Naseer	Presence of microbial contamination on different surfaces(floors, Tap surface, Cleaning buckets, Mops) in HFH,Rwp	Ongoing
55	Javeria Mazhar	Utilization of blood and its components in critically ill patients of HFH	Ongoing
56	Tehreem Gul	ABO blood group association with DM type II	Ongoing
57	Arman Zahid	ABO blood group association with Myocardial infarction	Ongoing
58	Shabana Majeed	Frequency of Rh-Ab titer in pregnant females of HFH	Ongoing

Workshops Conducted by Pathology Department in 2019

S. No	Title of Research Course/Workshop	Name of Presenter	Date
01	Standard Precautions of Infection Control	Prof. Naeem Akhtar	21st Mar 2019
02	Outbreak of Pan resistant Acinetobacter infection in ICU of Tertiary care hospital during 2018	Dr. Kiran Fatima	21st Mar 2019
03	International Academy of pathology (IAP)/HCSP workshop	Dr NafisaWillkinson	20-Apr-2019
04	Diagnostic challenges in histopathology	Brig. Sajid Mushtaq	20-Mar-2019
05	Standard precautions of infection control	Brig Aamir Ikram	07-Mar-2019
06	Bio Safety in Laboratory Medicine	Brig. Dr. Amir Ikram (NIH)	07-Mar-2019
07	Sample Collection and Handling Hazards for Health Care Workers	Dr. Afreenish Amir (NIH)	09-Mar-2019
08	Fundamentals of Health Care Waste Management	Dr. Muhammad ArfatYameen (COMSATS)	09-Mar-2019
09	Bone Marrow Morphology	Maj. Gen.(R) Parvez Ahmad (QIH)	28-02-19
10	Quality Assurance in Blood Coagulation	Dr. Samina Amanat (PAEC Hospital)	28-02-19
11	Transfusion Medicine	Dr. Sajid Yazdani (AFIT)	02-03-19
12	Diagnosis of Endocrine Disorders	Lt. Col. Nayyar Chaudhary (AFIP)	09-03-19
13	Molecular Diagnostics in Collaboration with AFIP	Lt. Col. Nayyar Chaudhary (AFIP)	09-03-19
14	Histopathology Workshop	Brig. (R) Dr. Sajid Mushtaq (SKMCH&RC)	20-03-19

Title of Program

Doctor of Philosophy in Microbiology and Molecular Biology (PhD in Microbiology & Molecular Biology)

Introduction to PhD Program

Medical microbiology, also known as **''Clinical Microbiology''**, is the study of microbes which cause a human illness and their role in the disease. PhD Microbiology or Doctor of Philosophy Microbiology is doctorate microbiology course. This course is designed to offer to eligible candidate adequate medical research training relevant to the present medical, social and economic objectives of the country. To increase the number of clinical microbiologists who can play a major role in containing various infectious diseases in the society, RMU is offering a Ph.D program. Enrolled students will be trained to write research reports through a curriculum aimed at augmenting their skills of data presentation in graphical form and carry out independent research and teaching of undergraduates of BS(Hons) and MBBS and post graduates of M.Phil and MD. On the completion of doctorate degree scholars should submit their thesis and then they deserve the respective degree. Professionally such postgraduates have the option of pursuing relevant career opportunities in the hospitals, research and clinical laboratories, higher education institutions, pharmaceutical companies and biotechnology-based companies.

Objectives

Our mission is to train Post Graduates of Microbiology with excellent ability to teach, research and deal with daily laboratory work in the field of Microbiology effectively and efficiently at National, International and Regional levels.

At the completion of the required period of training, the PG-trainee should be able to:

- Prove competency & clarity of concepts in all basic and allied disciplines of microbiology.
- Teach, train and supervise post graduate students including BS/M.Phil/MD/Ph.D.
- Develop Research proposals and conduct research on microbiology & Molecular Biology independently.
- Teach, train and evaluate medical undergraduates and other health & health related professionals in the field of microbiology.
- Develop, implement, manage and monitor programs of laboratory diagnostics at different levels of health care delivery system.
- Identify and manage common laboratory work problems.
- Pursue continuous and self-directed professional education to keep one's knowledge and skills updated and disseminate new knowledge.
- Discharge skills of leadership.

Sites for Critical Appraisal

1. Infection Control Measures in a Tertiary Care Hospital
2. Quality assurance in clinical laboratory practice.
3. Pattern of antibiotic resistance at RMU's Allied Hospitals.
4. Pattern of community acquired and nosocomial infection.

Career Prospects in PhD Microbiology & Molecular Biology

For successful postgraduates of the course, research opportunities abound in areas such as urban disease control, formulation research, clinical research, analytical development, and new drug development. Self-employed microbiologists may set up their own laboratories.

Research in the field of Microbiology finds application in fields like biophysics, science, pharmaceutical, Food and drink industry, Colleges and

universities, Forensic science labs, Environmental agencies, Healthcare organizations and medical colleges, Biotechnology companies, etc. They can also have jobs in research organizations and higher education institutions.

PhD Microbiology & Molecular Biology Job Types

- Post graduate teacher
- Undergraduate medical teacher
- Research supervisor
- Medical microbiologist
- Clinical research microbiologist
- Microbiology laboratory quality control officer
- Infection control specialist

ADMISSION CRITERIA / ADMISSION POLICY FOR PhD MICROBIOLOGY AND MOLECULAR BIOLOGY

Eligibility Criteria:

Eligibility criteria for admission in PhD Microbiology & Molecular Biology will be as under:-

(1) **Basic Qualification**: MBBS, BDS, BS MLT.

(2) **Postgraduate Qualification**:

a) MPhil / FCPS in Microbiology OR

b) MPhil Molecular Biology with Microbiology as minor Subject OR

c) MPhil Biochemistry with Microbiology as minor Subject OR

d) Equivalent qualification from HEC recognized institutions.

Candidates who secured First Division in annual system or CGPA 3.0 out of 4.0 in semester system will be eligible for admission in PhD Program.

(3) RMU will conduct its own PhD entrance test and qualifying score shall be 70%.

(4) Those candidates already passed GAT Subject with minimum 60% marks or having valid GRE-Subject Test (with minimum 60 percentile score) will be exempted from RMU entry test.

Admission Process:

(1) Applications for admission in PhD shall be applied online through RMU website portal. The required documents together with a hard copy of the duly filled-in/complete admission application form along with receipt of application processing fee shall be sent through registered post or courier to the RMU Admission Office.

(2) The candidates in government service shall furnish no objection certificates from their competent departmental authorities for the educational activity being applied for.

(3) Entrance test for Ph.D. course in RMU will be conducted under the administrative supervision of the Controller of Examinations in coordination with the Examination Committee of RMU. The subjects shall be specified by three subject expert with PhD degree in line with the policy of HEC/ RMU.

(4) The Admission Office shall thoroughly scrutinize all the applications received for admission, shall issue written entry test date , conduct the exam and shortlist the candidates, issue /interview schedule indicating venue and date to every short listed candidate and coordinate with the Controller of Examinations for timely smooth conduct of the scheduled interviews through the Admission Committee.

(5) All those cases will never be entertained to apply for admission whose registration or admission in RMU has been earlier cancelled due to any disciplinary reasons.
(6) No objection certificate from HEC shall be mandatory in case of foreign students. A TOEFL score of 500 or IELTS score of 5.50 will also be included in eligibility criteria.
(7) The foreign students under international student exchange programs may be enrolled/ admitted, subject to prior approval from the Vice Chancellor for any single or more semester(s) or course(s) subject to such conditions as may be agreed by the competent authorities under the relevant exchange programs.
(8) The students may take courses/ Rotation at other HEC recognized universities subject to approval by the student supervisor and the concerned Dean.

Selection and Merit Computation:

(1) Admissions in PhD Microbiology and Molecular Biology courses shall be made purely on open merit lines on 70% minimum qualifying marks out of the aggregate hundred percent trifurcating its percentile into three components namely: 25% for previous academic performance, 50% for entry test/ GAT Subject / GRE score and 25% for interview.
(2) The final merit list of names of the candidates selected and recommended for admission shall be conveyed to the Registrar's Office for seeking final approval from the Vice Chancellor.
(3) The finally admitted students list shall be sent to the concerned Department for enlisting the filled-in registration forms from the students and then send to the Registrar's Office for eventual issuance of registration numbers.
(4) For any unforeseen reason, when a student cannot continue with his/ her studies in the University, the student may send an official request through his HOD and Dean/ Head of institution to the Registrar for clearance and notification of release from the University.

Duration of Course

The minimum duration of PhD program shall be of 03 years and maximum

08 years.

Date of commencements: Fall 2021

Program Specifications–PhD Microbiology & Molecular Biology

(As per curriculum / syllabus of University of Health Sciences, Lahore)

COURSE TITLE	**PhD Microbiology & Molecular Biology**
COURSE DURATION	**Minimum 3 years**
TYPE OF STUDY	**Full time**
STUDY SYSTEM	**Semesters system**
TOTAL CREDIT HOURS	**Credit hours: 18**
CREDIT HOURS DISTRIBUTION - SEMESTER WISE (Course work)	**Credit hours distribution** **Year 1** **Semester 1=09** **Semester 2= 09**
Synopsis writing and approval	**Year 1** **Semester 1 = Research topic approval** **Semester 2 = Synopsis writing and comprehensive exam`** **Year 2 = research work** **Year 3 =research work & thesis writing**
COURSE TITLE WITH STUDY HOURS DISTRIBUTION	**Study per semester = 16 weeks** **Prep leave = 2 weeks** **Examination = 1 week** **Semester break = 1 week**

Teaching Methodologies

The objectives of the training may be achieved through different modes, some of which are listed below:

- Assigning responsibilities of teaching the undergraduates of BS (Hons), MBBS and M.Phil.
- Seeking information through Journal clubs, library and Internet.
- Attending workshops, Seminars, conferences, lectures, small group discussions, etc.
- Arranging regular quiz sessions for students
- Completion of assignments
- Patient/case-based learning
- Flip classroom technique
- Assisting/Supervising Research projects of undergraduates of BS (Hons), MBBS and M. Phil students.
- Attachments with Federal, Provincial and District outlets to acquire technical know-how of laboratory work.
- Practical laboratory work in Diagnostic Microbiology at RMU allied hospitals.

Semester-Wise Break-Up of Credit Hours

The total program consists of 18 credits which the student will have to complete in first year in which 6 credit hours are for teaching compulsory minor subjects. Distribution is as under:

- Formal teaching (Lectures, Demonstration, Journal Club, Tutorials and Interactive Session)
    - 1 Credit = 16 hours
- Practical Work (Presentations, Workshops, Attachments, Research)
    - 1 Credit = 32 hours

Semester-Wise Distribution of Credit Hours

Topics	Credit Hours
Year 1	
Semester 1	**16 weeks/9 credits**
General and systematic bacteriology and clinical microbiology (BAC-01)	2 credit Hours
Immunology and Virology(IMM-01)	1 credit Hours
Molecular Biology (MB-01)	3 credit Hours
Research Methodology (RM-01) and Computer Skills (CS-01)- Mandatory workshops	2 credit Hours
Laboratory technique practices and diagnostics (practical work and presentations of Microbiology and Molecular Biology)	1 credit Hours
Preparatory leave	2 Weeks
Exam	1 week
Semester Break	1 week
Semester 2	**16 weeks/9 credit Hours**
Bioethics/medical ethics(BE-01) Medical education(ME-01) Biostatistics(BS-01),	2 credit Hours
Parasitology (PAR-01) and Mycology(MYC-01)	1 credit Hour
Environmental microbiology & Food microbiology(ENV-01)	1 credit Hours
Molecular biology (MB-02)	2 credit Hours
Laboratory technique practices and	3 credit Hours

diagnostics	
Preparatory leave	2 Weeks
Semester Exam	1 week
Synopsis writing	
Comprehensive Exam	
Year 2	Research work
Year 3	Research work and thesis writing

Compulsory activities

- Library
- Laboratory training

LIST OF MANDATORY WORKSHOPS	
SEMESTER 1	**Credit hours**
Vision & Time Management=3days	01 Credit Hour
Research methodology and Medical/Synopsis writing=3 days workshop (Hands on)	01 Credit Hour
Literature search and selection of research topic =1day workshop	01 Credit Hour
Computer Skills=1 day	
Reference citation (End Note, Medley)=1 days	
	Total Credit Hours= 03
SEMESTER 2	
Animal handling/bioethics/Medical Ethics =8 hours	Credit Hour=0.5=counted in minors
Grant application=4 hours	Credit Hour=0.25
Medical Education: Leadership, Communication skills, Interactive lectures & Small group discussion (SGD)=day 1 How to attempt postgraduate SAQs=3 hours=day2 Assessment tools(Objectively structured practical examination OSPE, Multiple choice questions MCQs)=3 hours= day 3	Credit Hour=0.75 =counted in minors
	Total Credit Hour=1.5
Basic and Advance Statistical analysis=3 days	Credit Hour=1
	Total Credit Hour=1
Article writing=4 hours	Credit Hour=0.5
Thesis writing=4 hours	
	Total Credit Hour=0.5
Total Credit Hour=06	

Year 1

Semester 1

Duration: 16 weeks

Credit hours: 9

Subjects

- Bacteriology
- Immunology and molecular Biology
- Virology
- Research methodologies/ computer skills

BAC- 01. Bacteriology

Learning Objectives

Upon completion of course work the students should be able to:

1. Understand the epidemiology and pathogenesis of various bacterial infections
2. Identify the bacterial colonies on the basis of biochemical tests
3. Learn the basic laboratory skills required for growth of bacteria
4. Master the art of sterilization and disinfection
5. Learn the antibiotic susceptibility pattern of various bacteria
6. To study various community acquired and nosocomial infections

General Bacteriology

1. History of Microbiology
2. Morphology of Bacteria and other microorganisms
3. Normal flora of human body
4. Bacterial metabolism
5. Bacterial toxins
6. Nomenclature and classification of microorganisms
7. Growth & nutrition of bacteria
8. Host parasite relationship

9. Nosocomial infection

Systematic Bacteriology

1. Gram positive cocci of medical importance including Staphylococci and streptococci.
2. Gram negative cocci and coccobacilli including Neisseria, Morexella, Haemophilus, Bordetella, Francisella, Brucella and Pasteurella
3. Gram positive aerobic bacilli including Listeria, Bacillus and Corynebacterium
4. Gram positive anaerobic bacilli including Clostridia and Actinomycetes
5. Gram negative bacilli of medical importance including Enterobacteriaceae, Helicobacter, Campylobacter & Spirillum, Vibrios, Aeromonas, Gardnerella, Pseudomonas, Bacteroides, anaerobic gram-negative bacilli
6. Mycobacteria
7. Spirochetes including Borrelia, Leptospira and Spirochetes
8. Chlamydiae
9. Mycoplasmatales; Mycoplasma, Ureaplasma, Acholeplasma and other Mycoplasma
10. Rickettsiae, Coxiella, Bartonella
11. Actinomycetes & Nocardia

Clinical Microbiology

1. Epidemiology of infectious diseases
2. Hospital acquired infections
3. Investigation of an infectious outbreak
4. Respiratory tract infections
5. Urinary tract infections
6. Central nervous system infections

7. Congenital infections
8. Reproductive tract infection
9. Gastrointestinal infection
10. Hepatitis
11. Pyrexia of unknown origin
12. Infections of eye
13. Infections of ear and nose
14. Infections of cardiovascular system
15. Hemorrhagic fevers
16. Sexually transmitted diseases
17. Emerging & Reemerging infections disease
18. Opportunistic infections

Diagnostic Microbiology (Practical and Presentations)

1. Microscopy
2. Culture media
3. Antimicrobials and antimicrobial drug resistance
4. Biosafety including universal containment
5. Physical and biological containment
6. Sterilization and disinfection
7. Isolation & identification of bacteria
8. Isolation and identification of fungi
9. Common laboratory contaminant fungi
10. Isolation & identification of viruses
11. Methods of identification of parasites
12. Automation in Microbiology
13. Molecular techniques in Microbiology
14. Quality control in Microbiology
15. Quality Assurance in Microbiology

16. Quantitative techniques in Microbiology
17. Immunological diagnosis of infectious diseases
18. Microbiology of hospital environment
19. Management of hospital waste

IMM-01 . Immunology and Virology

Learning Objectives

- To understand the various concepts of general immunology
- To study the antigen and antibody techniques used for serological testing of various infectious diseases
- To study the immunodeficiency diseases
- To understand the concept of autoimmunity and autoimmune diseases
- To understand the concept of MHC and transplant immunity
- To study in detail tumor markers

Course Contents

1. Components of immune system
2. Innate and acquired immunity
3. Cells & organs involved in immune response
4. Antigens
5. Immunoglobulins
6. Cell mediated immunity
7. Antibody mediated immunity
8. Cytokines
9. Complement in health and disease
10. Hypersensitivity reactions
11. Immunodeficiency
12. Autoimmunity
13. Immunological techniques
14. Tumor immunity

15. MHC and Transplant Immunity

Practical

- Serological testing
- PCR
- ELISA

VIR-01 Virology

Learning Objectives

- To understand the basic structure, general properties and classification of viruses
- To understand the replication cycles, epidemiology and pathogenesis of various viruses
- To master the basic/molecular techniques used in laboratory for diagnosis of viral infections
- To study the pattern of various viral hemorrhagic fevers
- To understand the mechanism by which oncogenic viruses cause cancer

Course Contents

1. General properties of viruses
2. Classification of viruses
3. Morphology: Virus structure
4. Virus replication
5. Laboratory diagnosis of viral infections
6. DNA viruses of medical importance including Poxviridae, Herpesviridae, Adenoviridae, Hepadna virus, Papovaviridae, Parvoviridae
7. 6. RNA viruses of medical importance including Picornaviridae, Caliciviridae, Togaviridae, Flaviviridae, Orthomyxoviridae, Paramyxoviridae, Coronaviridae, Arenaviridae, Bunyaviridae, Retroviridae, Rhabdoviridae, Reoviridae, Filoviridae
8. Oncogenic viruses

Practical

1. Collection and safe handling of samples.
2. Practicing biological containment
3. Identification of infectious agent through ELISA & PCR.

RM-01 Research Methodology

Learning Objectives

The primary objective of this course is to develop a research orientation among the scholars and to acquaint them with fundamentals of research methods. Specifically, the course aims at introducing them to the basic concepts used in research and to scientific social research methods and their approach. It includes discussions on sampling techniques, research designs and techniques of analysis. Some other objectives of the course are:

- To develop understanding of the basic framework of research process
- To develop an understanding of various research designs and techniques
- To identify various sources of information for literature review and data collection
- To develop an understanding of the ethical dimensions of conducting applied research
- Appreciate the components of scholarly writing and evaluate its quality.

CS-01 Computer Skills

Learning Objectives

To train the research students in the analytical tools required during the Ph.D. Course and to develop computational skills.

Course Contents

- Basic Concepts of Computer
- History of Computer
- Concept of Computer hardware

- Concept of Computer languages
- Concept of Computer Software e.g. SPSS
- Computer applications in Biology Spreadsheet tools: Introduction to spreadsheet applications, features, using formulas and functions, Data storing, Features for Statistical data analysis, Generating charts / graph and other features, Tools – Microsoft Excel or similar.
- Presentation tools: Introduction, features and functions, Presentation of Power Point Presentation, customizing presentation, Showing presentation, Tools – Microsoft Power Point or Similar
- Web Search: Introduction to Internet, Use of Internet and WWW, Use of search engines, Biological data basis.

Molecular Biology (MB-01)
(Course-1)(1st Semester) = 3 credits

- Central dogma (Replication, Transcription, translation, post-translation modification),
- Reserves Transcriptase
- DNA Repair
- Recombinant DNATechnology /Genetic Engineering
- Regulation of Gene Expression
- Gene Mutation
- Gene fingerprinting
- Oncogenes

Laboratory techniques

- PCR
- Blotting Techniques (Sothern, Western and Northern Blotting)

Semester 2

Duration: 16 weeks

Credit hours: 9

Course Outline

Biostatistics

Medical education/medical ethics/ bioethics

Parasitology

Mycology

Environmental. Plant and food microbiology

Molecular Biology part ll

Laboratory techniques

BE-01. BIOETHICS

Course Objectives

The ***ethics curriculum*** is designed to provide students with the conceptual tools that they will need to navigate the ***ethical*** issues that are commonly encountered in clinical practice. Program helps students to develop skills in critical reasoning and in using the basic concepts of medical ethics it also fosters the habits of critical reflection and discussion about the ethical issues.

Thorough exploration of ethics is critical to developing exemplary scholars and teachers. Focusing on discussion, curriculum considers central ethical and legal principles, and research ethics.

Course Content:

- **Professional Responsibilities**
  - Student Responsibilities/ Professionalism
  - Qualities of a Physician/Codes of Ethics
  - Should Patients Be Learning Tools?
- **Central Ethical & Legal Principles**
  - Duty to Provide Care (Trust & Fiduciary Responsibility)
  - Truth Telling and Informed Consent for Treatment
  - Confidentiality and The Duty to Warn
- **Research Ethics [Epidemiology]**
  - Ethical Dangers of Human Subject Research
  - The Importance of Research and The Development of New Therapies

    - The Common Rule: Requirements for The Ethical Conduct of Research
- **Justice and Medicine**
    - Justice in Clinical Practice
    - The Right to Health Care
    - Allocation of Transplant Organs
- **The Nature and Value of Autonomy**
    - Concepts of Autonomy
    - Concept of beneficence
    - Concept ofNon-maleficence
    - Standards for Surrogate Decision Making
    - Refusal of Treatment and Justified Paternalism
    - Advance Directives and Proxies
- **Clinical Moral Reasoning: A Systematic Approach to Clinical Ethics Dilemma**
    - Critical Care -Family Meeting
    - Emergency Medicine - Confidentiality and Legal Responsibility
    - Family Practice -Adherence and Compliance
    - Geriatrics -Giving Bad News
    - Medicine -Responding to Families
    - Neurology -Disclosing a Diagnosis
    - Ob/Gyn-Reproductive Choice
    - Pediatrics -Parental Discretion
    - Psychiatry -Treatment over Objection and Confidentiality
    - Surgery -Identifying Ethical Issues
- **Animal Handling Research ethics**;

Reproduction and fertility; genetics and the human future. Animal preparation and experiments on laboratory animals, maintenance of animal

house; Routine physiology experiments on animals and humans. Animal rights in experimentation.

- **Learning Objectives Of Course**

At the end of the course the student should be able to:

- Describe Student Responsibilities/ Professionalism
- Enlist Qualities of a Physician
- Discuss Codes of Ethics
- Elaborate Trust & Fiduciary Responsibility
- Describe importance of Truth Telling and Informed Consent for Treatment
- Know Confidentiality and The Duty to Warn
- Discuss Ethical Dangers of Human Subject Research
- Describe importance of Research and The Development of New Therapies
- Elaborate the Common Rule: Requirements for The Ethical Conduct of Research
- Explain Justice in Clinical Practice
- State the Right to Health Care
- Discuss Allocation of Transplant Organs
- Describe Concepts of Autonomy
- Enlist Standards for Surrogate Decision Making
- Discuss Refusal of Treatment and Justified Paternalism
- Describe Advance Directives and Proxies
- Explain

a-Confidentiality and Legal Responsibility

Adherence and Compliance

a. Geriatrics -Giving Bad News

- Analyze bioethics literature critically and comprehend the foundations of Bioethics theory

- Understand ethical issues regarding handling of research animals.
- Sacrifice research animals according to ethical principles.
- Comprehend basic knowledge of the ethical issues in biomedical research
- Comprehend ethical considerations in using animals for research experiments
- Prepare an animal model for research
- Exhibit attitude towards research on human volunteers, experimental animals and ethical aspects
- Understand 3 R rule regarding animals
- Learn the efforts to minimize the discomfort, infection, illness and pain of animal subjects.
- Interpret the results and draw inference

ME-01 Medical Education

Rationale:

Due to the advancement & development of innovative educational strategies with implementation of E. Learning environment, technology zenith and advance scientific research in medical & allied health, the health professionals (Basic sciences & clinical teachers) require to be acquaint with all these innovations and demonstrate essential skills & competencies as a physician, teacher, scholar, researcher and leader. This means that training of health professionals requires high standards of education at par with the realities of the practical world. Along with the expansion of health professionals as a need, a reform in health professions education is taking place world over e.g. Curriculum integration, implementation of PBL/CBL, use of simulator in teaching, virtual patients, OSCE/OSPE as an assessment tools etc. Therefore, this course is designed keeping in mind the basic

requirements for a medical teacher (Basic sciences) in Health Profession Education to demonstrate the competencies of an effective medical teacher.

Course Goal:

The course is endeavors to train post graduate students (basic medical sciences) in basics of health profession education to produce competent health profession teacher.

Outcomes of Course:

By the end of the course the students will be able to:

- Adept in basic knowledge and its application in the core areas of medical education i.e. educational environment & students, teaching and learning, curriculum development including educational strategies & curriculum themes, Students assessment and Program evaluation.
- Acquire knowledge, skills and attitude requires for a competent health profession educator by understanding & applying the theoretical and empirical literature in medical education
- Critically examine the preparation requires for their role as educators of their profession through enhancing students understanding and implementation of principles of adult learning and teaching in relation to their target group.
- Apply the educational theories and cognitive psychology in support of their role as an educator in practice.
- Use knowledge and skills require for Designing & developing an integrated curriculum/Module at an undergraduate level.
- Understand and apply the fundamentals of educational methodologies (Learning and Teaching)

while "Teaching to learn and learning to teach".

- Understand and apply the fundamental principles in 'Assessment' while designing an assessment plan and assessment tools.
- Design a plan with tools for evaluating a teaching program.

- Demonstrate effective communication skills (active participation, Pro-activeness, professionalism, group dynamics, team building, conflict resolution, negotiation skills, leadership skills etc) while working in the group/team tasks.

Course Overview and description:

The whole course is based on principles of constructive cognitive philosophy and follows the FAIR criteria to improve learning. According to constructive philosophy the teacher is more than a transmitter of information and has responsibility for managing the student's learning. The reflective teacher understands the principles of learning. Hence, this course has four key features identified for effective learning – the FAIR criteria:

F	Feedback to the learner as to progress
A	Active rather than passive learning
I	Interest or motivation of the learner
R	Relevance to the perceived and real needs of the learner

This course is designed for the post gradates medical students to develop them as an effective team member and effective teacher in an Integrated Curriculum development, its implementation and evaluation. The students will understand and apply the basic core concepts in medical education while working as Task Force member, conducting an integrated session for instance '**Problem Based Learning Sessions' etc.** and assessing the students**.** The essential Core area and themes in medical education in which students will be trained are 1) educational environment & students, 2) teaching and learning strategies, 3) curriculum development including educational strategies & curriculum themes, 4) Students assessment and 5) Program evaluation. The course curriculum is structurally organized in these **five Themes.**

Instruction strategies:

- Interactive lectures by the teacher followed by the group discussions/activity weekly 1 hrs.
- Self-study and literature search- for assignment.
- Assignments (Students are expected to submit 02 evidence-based written assignment-01 major & 01 minor)

Assessment strategy:

1. **Formative assessment**- there will be continuous assessment on the ongoing small group activities and attitude of each student and that will be recorded through an evaluation performas (checklists, rating scales) used during the sessions. Constructive Feedback will be provided on it by the teachers. Students, who will score satisfactory and achieve the minimum required standard, will be allowed to sit in end of course/semester assessment.
2. **Summative assessment**:

Assessment modalities:

For Knowledge:

a) Students are expected to submit 02 evidence-based written assignments (01 major & 01 minor related to major themes).

b) Final end of Semester Exam: At the end of the course there will be a Theory Exam comprises of MEQ (Modified Essay Questions).

For Skill and attitude:

a) It will be assessed through ongoing continuous assessment in small group activities, presentations and mini projects assigned during the classes and that will be recorded through an evaluation performas (checklists, rating scales).

Learning Resources:

- A practical Guide for Medical Teacher by John A. Dent & Ronald M. Harden. (4th edition, A Book)
- Journal Articles will be provided from the latest medical education journals.
- Other reading materials from the renowned author's books and research work, some good websites.

Logistics / Training Resources for the course:

- Photostat facility for handouts and readings.
- Room for classes with multimedia.
- OHP and markers.
- Transparencies.
- Flip charts/stand and markers.
- Pointer.
- Paper reams (02).
- Folders to document course teaching and learning materials.

Course Sequencing, Time Planning and TOS

Total 18 hours of teaching: Each session will be of 01 hour

Sr. #	Theme #1	Theme #2	Theme #3	Theme #4	Theme #5	Total
Topic	Introduction to HPE& Educational Environment	Teaching and Learning	Curriculum: structural concepts and development	Assessment	Program Evaluation	
Duration	4hrs	4hrs	4hrs	4hrs	2hrs	18hrs
Marks	20	25	25	20	10	100

Course Content and Learning Objectives

THEME # 1:

Introduction to HPE& Educational Environment

Number of Lectures: 04

Content:

1. Introduction to HPE and competencies required in HPE
2. Educational environment which effect the students learning- factors that enhance or inhibit the learning the learning.
3. Various learning styles and merits and demerits- superficial and deep learning.

Learning Objectives:

1. Introduce with the themes of HPE, trend, Issues & Challenges IN HPE& Competencies required in HPE.
2. Discuss the competencies of a Medical Teacher.

3. Identify the factors which constitute the educational environment and effect the students learning i.e. the factors that enhance or inhibit the learning.
4. Identify various learning styles, its merits and demerits- superficial and deep learning.

THEME # 2:

Teaching & Learning

Number of Lectures: 04

Content:

1. The characteristics of adult learners- the principles of adult learning.
2. Different instructional methodology or modes of information transfer.
3. Teaching and Learning in large group: Interactive lecturing.
4. Teaching and Learning in small groups teaching and learning: PBL, CBL why? How? Its principles, process – tutors and students role.

Learning Objectives:

1. Identify the characteristics of adult learners, and the principles of adult learning.
2. Link principles of adult learning with characteristics of modern curriculum.
3. Identify different modes of instruction and its strength and weakness.
4. Use the process of planning while designing & conducting large group teaching (Interactive lectures) session.
5. Use the process of planning while designing & conducting small group discussion session.
6. Discuss the principles process, role of tutors and students, student's assessment in a PBL& CBL session.
7. Demonstrate effective communication skills (active participation, Proactiveness, professionalism, group dynamics, team building, conflict resolution, negotiation skills, leadership skills etc) while working in the group/team tasks.

THEME # 3:

Curriculums: structural concepts and development

Number of Lectures: 04

Content:

1. The curriculum and its components.
2. Various curricular philosophies & Perspectives- curricula past, present, future.
3. Innovative trends in curriculum, educational strategies and curriculum themes with emphasis on integration.
4. The Hardens 10 questions for curricular planning.
5. Differentiation between the aims, goals, outcomes, objectives
6. Writing Learning objectives and Levels in Bloom's taxonomy of objectives for a course.
7. The selection of core content while integrated curriculum development.
8. Steps of Integrated Modules planning & development.

Learning Objectives:

1. Define curriculum.
2. Differentiate between the different components of a curriculum.
3. `Enlist Harden's 10 questions for curricular planning &WFME standards
4. Discuss various curricular philosophies & Perspectives - curricula past, present, future.
5. Identify the trends in curriculum development, educational strategies and curriculum themes.
6. Discuss integrated curriculum and broad categories of integration in curriculum
7. Differentiate between the aims, goals, outcomes, objectives
8. Differentiate between the different levels in Bloom's taxonomy of objectives.
9. Write learning objectives of 3 different domains for an integrated module and match it with the teaching and learning strategies.
10. Steps of Integrated Modules planning & development
11. Select core content while designing an integrated curriculum development.

THEME # 4:

Assessments

Number of Lectures: 04

Content:

1. Definition of assessment and evaluation.
2. Differentiation between the formative &summative assessment, Criterion referenced and norm referenced.
3. Characteristics of a good examination and definitions of validity and reliability of exams. Matching of learning objectives with the assessment tools
4. Design various assessment tools for knowledge, skill & attitude-MCQs, SEQs, & OSCE/OSPE
5. Importance and Contents of a table of specification.

Learning Objectives:

1. Differentiate between assessment and evaluation
2. Differentiation between the formative &summative assessment, Criterion referenced and norm referenced.
3. Discuss the characteristics of a good examination.
4. Match learning objectives with the assessment tools (Miller's Pyramid).
5. Construct various assessment tools e.g. M.C.Qs, SEQ, OSCE/OSE
6. Match the objectives with the assessment tools.
7. Develop a table of specification for a module.

THEME # 5:

Program Evaluations

Number of Lectures: 02

Learning Objectives:

1. Discuss the importance of evaluating a teaching session/ course/ program.
2. Identify the ways of assessing the effectiveness of an educational program.

BS-01 Biostatistics

Learning Objectives

Upon completion the students will be able to comprehend basic knowledge of epidemiology and will be able to:

1. Define epidemiology and know the principles of various study designs
2. Know how to design a study and describe the validity and reliability of a study design
3. Know the fundamental concepts and methods of statistics in the areas of medical and biological research
4. Have good command on use of statistical computer software for data analysis
5. Identify and prioritize research problems with literature review.
6. Formulation of research objectives
7. Learn Data collection techniques and sampling, planning for data collection, collation and analysis.
8. Planning for pilot study followed by main study along with Budget making and plan for dissemination.
9. Identify and define the basic concepts and procedures required for data analysis and interpretation.

10. Analyze and interpret the data collected for the research project and draw conclusions related to the objectives of your study.
11. Write a clear and concise research report (paper for a peer reviewed journal) and a summary of the major findings and recommendations for each of the different parties interested in the results.
12. Present the major findings and the recommendations of your study to policy-makers managers and to the subjects of your research together with them to finalize the recommendations.
13. Prepare a plan of action for the dissemination, communication and utilization of the findings and (if required) make recommendations for additional research.

(Objective 10 -14 will also be covered in 3rd semester SPSS workshop)

Course Contents

The course contents will include; Descriptive epidemiology, analytic epidemiology and epidemiological inference, Classification, morbidity and mortality rates, ratios, incidence, prevalence, sampling, screening, epidemiological models, Types of study design; their importance, uses, and limitations, field trials, controlled epidemiological surveys, sources of bias and causal models.

Introduction to statistics, types of statistical applications, population and samples, data analysis and presentation, variables, elementary statistical methods, tabulation, chart and diagram preparations, measures of central tendency and dispersion, sampling techniques and sample size estimation, probability and proportions, Tests of significance; normal test, t test, Chi square test etc. correlation and its applications, linear regression and multiple regression, Clinical trials and intervention studies, Measures for developing health statistical indicators: morbidity and mortality statistics, Use of latest statistical computer software for data analysis.

PAR-01 Parasitology

Learning Objectives

- To understand the existence of human pathogenic parasites.
- To study some selected parasitic human diseases, their diagnosis, treatment and control.

Course Contents

- General characters & classification of parasites
- Protozoan parasites of medical importance including Entamoeba, Free living amoebae, Giardia, Trichomonas, Leishmania, Trypanosoma, Plasmodium, Toxoplasma, Sarcocystis, Cryptosporidium, Microsporidium,
- Helminthology of medical importance including those belonging to cestodes (Diphyllobothrium, Taenia, Echinococcus, Hymenolepis, Multiceps etc.) Trematodes (Schistosomes, Fasciolopsis, Gastrodiscoides, Paragonimus, Clonorchis, Opisthorchis etc.) and Nematodes (Trichuris, Trichinella, Strongyloides, Ankylostoma, Necator, Ascaris, Toxocara, Enterobius, Filarial worms, Dracunculus)

Practical

- Collection and processing of clinical samples.
- Immunological and molecular techniques.
- Detection of plasmodium in blood.
- Detection of Protozoa, Helminths and Amoeba in clinical samples and water.
- Staining methods.

MYC-01. Mycology

Learning Objectives

- To learn about some selected human fungal infections

- To learn about etiology of some cutaneous and systematic mycosis.
- To learn about sample collection, diagnosis and control of fungal infections.

Course Contents

- General characteristics & classification of fungi
- Morphology & reproduction of fungi
- Yeasts and yeast like fungi of medical importance including Candida, Cryptococcus, Malassezia, Trichosporon, Geotrichum, Saccharomyces etc.
- Mycelia fungi of medical importance including Aspergillus, Zygomycetes, Pseudallescheria, Fusarium, Piedra, other dematiaceous hyphomycetes and hyalohyphomycosis etc.
- Dimorphic fungi including Histoplasma, Blastomyces, Coccidioides, Paracoccidioides, Sporothrix, Penicillium marneffei etc.
- Dermatophytes

Practical

- Detection of etiological agents in sputum, nails, hairs, and skin samples.
- Microscopic observation of fungi in clinical samples.
- Cultivation of fungi.
- Rapid molecular diagnostic methods
- Antifungal sensitivity test.

ENV-01. Environmental and Food Microbiology

Learning objectives

- To learn about diversified environmental pathogenic implications on public health.
- To get brief idea about epidemiology and community acquired ailments.
- To learn about waste water health hazards and its management.

- To learn about the commercial utilization of microbes for the production of organic acids, organic solvents and fermentable products.
- To learn the industrial microbial processing techniques.
- To learn about the phytopathogen viruses of economically important plants.
- Understanding of plant viruses classification and their mode of replication.
- To study microbial existence and activity on soil texture and fertility
- To learn about the dynamics of host pathogen interaction that result in diseases.

Environmental Microbiology

Course contents

Recent advances in Microbiological waste treatment methods -

- Activated Sludge Process
- Anaerobic sludge digestion
- Root zone technology
- Microbial biosorption technology
- Mass scale production of Effective Microorganisms (EM) for waste treatment.
- Economics of waste treatment
- Hot springs, acid springs and lakes
- Microbial life in hyper saline environments – Eco physiological aspects, sea and salt lakes.
- Microbial life at low temperatures
- Microbiology to 10,500 meters under the deep sea.
- Anaerobic Microorganisms – Eco physiological aspects, principles and techniques for the isolation, enumeration and identification of Methanogens,

- Dissimilatory Sulphate reducing and Anoxygenic Phototrophic bacteria Geomicrobiological processes – physiological and biochemical aspects,
- Methodsi n Geomicrobiology. Biodiversity as a source of innovation in Biotechnology

Food Microbiology

- Microbiology of Primary Food Commodities
- Food Microbiology and Public Health
- Bacterial Agents of Foodborne Illness
- Non-bacterial Agents of Foodborne Illness
- Fermented and Microbial Foods
- Methods for the Microbiological Examination of Foods
- Controlling the Microbiological Quality of Foods
- The Scope of Food Microbiology
- Micro-organisms and Food Materials
- Factors Affecting the Growth and Survival of Micro-organisms in Foods

Molecular Biology (MB-02)
Medical Genetics Course ll= (Credit hours 2)

- Human Genome Project
- Gene therapy
- Restriction- endonucleases
- Genetic disorders (Autism, down syndrome, cystic Fibrosis,Cohn's diseases, Huntington's diseases)

  Laboratory techniques
  - Gel electrophoresis (SDS-PAGE)
  - RFLP etc

Policy for PhD Thesis Writing

The thesis submitted by a PhD candidate shall comply with the following conditions:

a) It shall form a distinct contribution to knowledge and afford evidence of originality, shown by the discovery of new facts, by the exercise of independent critical judgment, and/or by the invention of new methods of investigation.

b) It shall not include research work for which a degree has already been conferred in this or any other university.

c) It shall be written in English and the presentation must be satisfactory for publication.

d) Any part of the thesis which has been published before submission of the thesis may be appended at the end of the thesis.

e) The thesis shall be typed on A4 size paper with margins of 1-½" on the left and 1" to the right, top and bottom of each page. The thesis shall be hard bound with maroon cloth cover and golden lettering on the front and the spine.

f) If a student who is re-admitted to PhD program and had previously spent the minimum period of three years as a PhD student, he/she may be allowed to submit the thesis after one year from the date of his/her re-admission.

Evaluation & Monitoring of the Training Program

The proposed / suggested evaluation of the training program will be done by:

a. Head of the department / Supervisor
b. Head of the institution.

Evaluation of the Trainee

360°evaluation of trainee as per HEC policy by:

- Head of institute
- Head of the Department
- Supervisor
- Mentors
- Faculty members
- Demonstrators
- Laboratory technologists
- Academic staff
- Other students
- Patients

Students will be evaluated on the basis of:

- Attendance record
- Performance of the scheduled / desired activity
- Participation in discussion (tutorial and seminar etc.)
- Efficiency and effort put in the assignment (lectures, demonstration, Computer training, etc.)
- Quiz
- Practical work
- Presentation and Computing skills

Criteria for Award of PhD Degree

- Additional PhD level course work of at least 18 credit hours followed by course exam and a comprehensive examination related to research work along with thesis defense will be essential for the award of PhD degree.
- PhD dissertation must be evaluated by at least two experts from technologically advanced countries.
- At least one Published research papers in an HEC approved journal (W or X category) is essential for the award of PhD degree.
- The examination shall be conducted at the end of each semester.
- At the end of every major topic there will be MCQs test in which marks will be distributed according to the credit hours assigned to each topic.
- The evaluation of the performance of the students shall be on the basis of presentations/tests/portfolio/log book which carries 150 marks per semester and semester examination of 500 marks.
- Each semester examination carries 500 marks.
- Question Paper will be set in the view of the /in accordance with the entire Syllabus and preferably covering each unit of syllabi.

Assessment Procedure

1. Assignments/tests/log book/portfolio 30 percent marks
2. Semester Exam:

Viva/practical OSPE 30 percent

Written Examination 40 percent

Calculate GPA as per University rules.

Marks Distribution

- *Total marks per semester* *500 marks*
- *MCQs* *100 marks*

- *SEQs* *100 marks (6 SEQs&2 long questions)*
- *Practical* *75 marks*
- *Viva* *75 marks*
- *Internal Evaluation (tests, log book, portfolio)* *150 marks*

Standard of Passing

- **Cleared the semester exams**
- **Cleared the comprehensive exam** If yes, then the evidence of clearing the comprehensive exam
- **Evaluation of Thesis,** If the scholar has completed his/ her thesis for PhD then the thesis has to be examined by two foreigner examiners from technologically/academically advanced countries.
- **Has the dissertation been defended:**
  If yes, then the details including date of defense, whether it was an open defense will be notified
- **Submission of paper for publication in HEC approved journals.** The scholar has to publish at least 1 research papers in HEC approved journal for the purpose to attain Ph.D. Degree. For this purpose the evidence of publication has to be submitted.

Defense Examination

a) There shall be a standing list of external examiners for the department consisting of persons of eminence in the field of research. The list shall be suggested from time to time by the board of studies of faculty concerned and approved by the research board. The external examiners will be requested to critically examine the thesis for its suitability for the award of PhD degree.

b) There shall also be a standing list of local examiners for department consisting of eminent person engaged in research in the field of

microbiology and molecular biology. The list shall be suggested from time to time by the board of studies of faculty concerned and approved by the research board. The local examiners will be requested to conduct the final viva-voce examinations of thesis.

c)

i. The candidate shall in the first instance submit six unbound copies of his/her completed thesis along with an application on prescribed form for the evaluation of his/her thesis, duly forwarded by his/her supervisor and the chairman of the department:
   - *02 for external*
   - *01 for examination section*
   - *01 for department office*
   - *01 for the supervisor*

ii. After corrections have been incorporated in accordance with the comments of external examiners; two copies of thesis in loose binding, to be sent to viva-voce examiners.

iii. After the viva-voce examination; four copies of the final hard-bound thesis be submitted:
   - *01 for examination section*
   - *01 for central library*
   - *01 for departmental office*
   - *01 for supervisor*

d) The supervisor shall suggest a panel of at least six external examiners from the approved list.

e) The vice-chancellor shall appoint three external examiners from the suggested panel to evaluate the thesis.

f) The reports of the examiners shall be placed before the research board for consideration.

g) If the thesis is adjudged as adequate by two of the three examiners, the research board shall allow the candidate to appear in the viva-voce (thesis defense) examination.

h) If two of the three examiners find that the thesis is wholly inadequate it may be rejected by the research board.

i) If any of the examiners suggests modification/revision of the thesis, the candidate shall be required to resubmit a revised version of the thesis, duly certified by the supervisor, within one year.

j) The revised version of the thesis shall be approved by the same examiner who suggested modification/revision of the thesis.

k) If any of the examiners finds the thesis adequate but suggests minor modifications/revision, this may be incorporated without referring again to the examiner as required in clause (i).

l) The viva-voce examination shall be conducted by the two external examiners appointed by the vice-chancellor from the panel approved by the research board, the supervisor and the chairman of the department concerned.

m) The viva-voce examination shall be open to the public but the evaluation will be done only by the panel of examiners.

n) If the candidate fails to satisfy the examiners in the viva-voce examination he/she may be given a chance to defend the thesis for the second and final time within a period of six months.

o) A candidate who successfully completes all the requirements shall be awarded, with the approval of the research board and the syndicate, the degree of Ph.D under the seal of the university.

p) The vice-chancellor may approve the recommendations of the research board on behalf of the syndicate regarding the award of Ph.D degree to the candidate.

Suggested Readings

Bacteriology

1. Bergey's Manual of Systematic Bacteriology (2nd Ed.), Volumes1 to 4 Springer
2. The Search for Bioactive Compounds from Microorganisms by S. Omura
3. Continuous Culture (Vol. 8) by A. C. R. Dean, D. C. Ellwood and C. G. T. Evans
4. Annual Reviews in Microbiology Volumes 46 & 48 by L. N. Ornston, A. Balows and E. P. Greenberg (eds). Academic Press
5. Biotechnology: Current Progress Volume 1 by P. N. Cheremisinoff and L. M. Ferrante. Technomic Publishing Co. Inc
6. Advances in Applied Microbiology volumes 6, 10, 17 by D. Perlman and Umbreit (eds). Academic Press.

Immunology

1. Kuby : Immunology; RA Goldsby, Thomas J. Kindt, Barbara A. Osborne.
2. Immunology by Roitt I. M., Brostoff J. and Male D. Gower medical publishing London.
3. Fundamentals of immunology 4th ed., Paul 1999, Lippencott Raven.

Computer Skills

1. Hochreiter, Sepp; Wagner, Roland. Bioinformatics Research and Development. Series Lecture notes in Computer Science, Springer, Latest Ed.

2. Mandoiu, Ion; Narasimhan, Giri; Zhang, Yanqing. Bioinformatics Research and Applications Series: Lecture Notes in Computer Science. Springer, Latest Ed.

Virology

1. Mahy, B.W.J.,& Van Regenmortel, M.H.V., 2008. Encyclopedia of Virology 3rd. Edition. Elservier 46
2. Cann, A. J., 2011. Principles of Molecular Virology.5th Edition. Academic Press.
3. Robert, W. Molecular Biology. 2011. McGraw-Hill Sciences
4. Ralf G. Dietzgen, R.F., and Ivan V. Kuzmin, I.V.,2012. Rhabdoviruses: Molecular Taxonomy, Evolution, Genomics,
5. Caister. 2012. Ecology, Host-Vector Interactions, Cytopathology and Control Academic Press. USA

Bioethics and Medical Ethics

1. John Arras and Bonnie Steinbock. Ethical Issues in Modern Medicine, Mayfield, Latest Ed.
2. Françoise Baylis, Jocelyn Downie, Benjamin Freedman, Barry Hoffmaster, and Susan Sherwin. Health Care Ethics in Canada. Harcourt Brace, Latest Ed.
3. Tom L. Beauchamp and James F. Childress. Principles of Biomedical Ethics. Latest Ed. Oxford University Press.
4. Jonathan Glover, Causing Death and Saving Lives. Penguin Books, Latest Ed.
5. Glenn C. Graber and David C. Thomasma. Theory and Practice in Medical Ethics. Continuum, Latest Ed.

6. Thomas A. Mappes and David Degrazia. Biomedical Ethics, 4th ed. McGraw-Hill, Latest Ed.
7. Gregory E. Pence. Classic Cases in Medical Ethics.2nd ed., McGraw-Hill, 1990.

Biostatistics:

1. Gordis, L. Epidemiology. Pennsylvania: W.B. Saunders Company. Latest Ed.
2. Rothman KJ. Modern Epidemiology. Boston: Little, Brown and Company, Latest Ed.
3. Kelsey JL, Thompson WD, Evans AS. Methods in Observational Epidemiology. New York: Oxford University Press, Latest Ed.
4. Kleinbaum DG, Kupper LL, Morgenstern H. Epidemiologic Research: Principles and Quantitative Methods. Belmont, CA: Lifetime Learning Publications, Latest Ed.
5. Lilienfeld DE, Stolley PD. Foundations of Epidemiology. New York: Oxford, Latest Ed.
6. Daniel WW. Biostatistics: A Foundation for Analysis in the Health Sciences. Latest Ed. John Wiley & Sons. Inc. New York.
   Larson R and Farber B. Elementary Statistics: Picturing the World. Latest Ed, Prentice Hall Publications. New Jersey USA.

Parasitology

1. Anne, Z. and Gary C., 2006. Veterinary Clinical Parasitology. Blackwell publishing.
2. Pearson, R.D., Gillespie, S.H., 2009. Principles and Practice of Clinical Parasitology.1st Edition. Wiley, John & Sons
3. Sun, T., 2012. Progress in Clinical Parasitology. Springer-Verlag New York, LLC

4. Zeibig, E., 2012. Clinical Parasitology: A Practical Approach. 2nd edition. Elsevier Health Sciences

Mycology

1. Webster, J. and Weber, R., 2008 Introduction to Mycology. Cambridge University Press.
2. Lechevealier, H., A practical guide to Generic Identification of Actinomycetes volume 4 of Bergey's Manual of Systematic Bacteriology. 90
3. Borkovich K. and Daniel J. E. 2010. Cellular and Molecular Biology of filamentous Fungi. ASM Press.
4. Errol R., Shadomy J. and Lyon G. H. 2011. Fundamental Medical Mycology. Wiley Blackwell.
5. Gioconda, S.B. and Richard, C. A., 2012. Pathogenic Fungi: Insights in Molecular Biology. Caister Academic Press.
6. Goadby K. W. ,2012. The Mycology of the Mouth. Rare Books Club

Environmental and Food Microbiology

- Industrial Microbiology by L. E. Casida Jr. Wiley International Ltd.
- Microbial Technology by H. J. Peppler. Academic Press
- Annual Reviews in Microbiology Volume 48 by L. N. Ornston, A. Balows and E. P. Greenberg (eds). Academic Press
- Food Microbiology by M. R. Adams and M. O. Moss
- Microbiological Aspects of Pollution Control by Dart and Stretton. Surabhi Publishers, Jaipur
- Food Microbiology Third Edition Martin R. Adams and Maurice O. Moss University of Surrey, Guildford, UK
- Biofertilizers by L. L. Somani and others. Scientific Publishers, Jodhpur

- Plant Pathology by J. C. Walker
- Bergey's Manual of Systematic Bacteriology Volume 1. Springer
- Annual Reviews in Microbiology Volumes 46 & 49 by L. N. Ornston, A. Balows and E. P. Greenberg (eds). Academic Press
- Microbes in Extreme Environments by D. J. Kushner

Reference Books Molecular Biology

1. Principals of Biochemistry (Albert Lehninger)
2. Streyer's Biochemistry
3. Biochemistry by Voet&Voet
4. Lippincott's Illustrated Reviews Biochemistry

Journals:

Computer skills

1. Journal of Bioinformatics and Computational Biology (JBCB)
2. BMC Bioinformatics

Bioethics

1. Cambridge Quarterly of Healthcare Ethics
2. Hastings Center Report
3. Journal of Clinical Ethics
4. Journal of Medical Ethics
5. Journal of Medicine and Philosophy
6. Kennedy Institute of Ethics Journal
7. Nursing Ethics

Biostatistics

1. Cancer Epidemiology
2. Epidemiologic Reviews

3. Annals of Epidemiology
4. American Journal of Epidemiology
5. International Journal of Epidemiology

Curriculum Vitae

PROF. DR. NAEEM AKHTAR, MBBS (Pak), PhD (Sheffield-UK)

Rawalpindi Medical University & Allied Hospitals, Rawalpindi, PAKISTAN

CURRENT POSITIONS

- **Dean, Undergraduate Studies**
  Rawalpindi Medical College & Allied Hospitals, Rawalpindi
- **Dean, Basic Sciences & Diagnostics**
  Rawalpindi Medical University & Allied Hospitals, Rawalpindi
- **Professor & Chairman, Department of Pathology**
  Rawalpindi Medical University & Allied Hospitals, Rawalpindi
- **Head & Consultant Microbiologist**
  Pathology Clinical Laboratories, Benazir Bhutto Hospital, Rawalpindi
- **Head, Infection Prevention and Control Program (IPCP)**
  Rawalpindi Medical University & Allied Hospitals, Rawalpindi
- **Director, Office of Research Innovation & Commercialization (ORIC)**
  Rawalpindi Medical University, Rawalpindi
- **Convener & Member, Curriculum Committee**
  Rawalpindi Medical University, Rawalpindi
- **Chairman, Libraries Committee**
  Rawalpindi Medical University, Rawalpindi
- **Chairman, Institutional Scholarship Award Committee (ISAC)**
  Rawalpindi Medical University, Rawalpindi
- **Chairman, Antibiotic Usage Policy Committee**
  Rawalpindi Medical University & Allied Hospitals, Rawalpindi
- **Director Admin / Chairman, Telemedicine Centre for COVID-19**
  Rawalpindi Medical University & Allied Hospitals, Rawalpindi
- **Member Advance Studies and Research Board**
  Rawalpindi Medical University, Rawalpindi
- **Member Finance and Planning Committee**
  Rawalpindi Medical University, Rawalpindi
- **Member, Career Counseling / Placement Committee**
  Rawalpindi Medical University, Rawalpindi
- **Member Committee for "Pakistan Randomized and Observational Trial to Evaluate Corona virus Treatment (PROTECT),**
  Rawalpindi Medical University & Allied Hospitals, Rawalpindi
- **Member Institutional Research Forum (IRF) / Ethical Review Board (ERB)**
  Rawalpindi Medical University, Rawalpindi
- **Adjunct Professor of Microbiology** & **Member Faculty Committee in Microbiology**
  University of Health Sciences, Lahore
- **Member Board of Studies**
  Department of Histopathology**,** Shaheed Zulfiqar Ali Bhutto Medical University, Islamabad

QUALIFICATIONS

1. **MBBS** (**1985**), Rawalpindi Medical College, University of the Punjab, Lahore, Pakistan.
2. **PhD in Microbiology** (**1992**). Department of Experimental & Clinical Microbiology, Faculty of Medicine & Dentistry, University of Sheffield, Medical School, UK.

AWARDS OBTAINED

1. Scholarship Award for PhD degree in Microbiology (**1987**). Awarded by the Government of Pakistan, Ministry of Science & Technology, Islamabad.
2. Overseas Research Students Award (**1990-91**). Awarded by the Committee of Vice-Chancellors & Principals of Universities and Colleges in United Kingdom.

APPROVED SUPERVISOR FOR PhD IN MICROBIOLOGY/MEDICINE

Approved supervisor for PhD in Microbiology/Medicine by Higher Education Commission, Islamabad, Pakistan; HEC-approved list of PhD supervisors (www.hec.gov.pk)

FORMERLY

- ***Associate Professor Microbiology*** *(Oct 2000-Sep 2005 & Nov-Dec 2005), Department of Microbiology, College of Medicine, King Faisal University & Consultant Microbiologist, King Fahd Hospital of the University, Dammam, Saudi Arabia.*
- ***Professor of Pathology & Consultant Microbiologist*** *(Jun 2013-Dec 2015). Department of Pathology, Sheikh Zayed Medical College/Hospital, Rahim Yar Khan.*

ACADEMIC CARRIER

- **House Officer** (Aug 1986-Jan 1987). Department of General Surgery, Rawalpindi General Hospital, Rawalpindi, Pakistan.
- **House Officer** (Feb 1987-May 1987), Department of General Medicine, Rawalpindi General Hospital, Rawalpindi, Pakistan.
- **Casualty Medical Officer** (Jun 87). Sir Ganga Ram Hospital, Lahore, Pakistan.
- **Resident Medical Officer** in Anesthesiology (Jul 1987-Mar 1988). Holy Family Hospital, Rawalpindi, Pakistan.
- **PhD Student in Microbiology** (Apr 1988-Dec 1991). Department of Experimental & Clinical Microbiology, Faculty of Medicine & Dentistry, University of Sheffield, Medical School, Sheffield, UK.
- **Member Local Genetic Manipulation Safety Committee** (1989-1991). University of Sheffield, UK.
- **Demonstrator** (May 1992), Department of Pathology, Rawalpindi Medical College, Rawalpindi, Pakistan.
- **Assistant Professor Microbiology** (Jun 1992-Oct 1993), Department of Pathology, Rawalpindi Medical College, Rawalpindi, Pakistan.
- **Assistant Professor Microbiology** (Nov 1993-Feb 1996), Department of Pathology, Quaid-i-Azam Medical College, Bahawalpur, Pakistan.
- **Honorary Lecturer in Pharmaceutical Microbiology** (April 1994-Apr 1995). Islamia University, Bahawalpur, Pakistan.
- **Assistant Professor Microbiology** (Mar 1996-May 1999), Department of Pathology, Rawalpindi Medical College, Rawalpindi, Pakistan.
- **Associate Professor Pathology (Microbiology)** (Jun 1999-Sep 2000), Department of Pathology, Rawalpindi Medical College, Rawalpindi, Pakistan. Head of Pathology Diagnostic Laboratories (Jul 1999-Sep 2000), Rawalpindi General Hospital, Rawalpindi, Pakistan.
- **Associate Professor Microbiology** (Oct 2000-Sep 2005 & Nov-Dec 2005), Department of Microbiology, College of Medicine, King Faisal University & Consultant Microbiologist, King Fahd Hospital of the University, Dammam, Saudi Arabia.
- **Professor, Head & Consultant Microbiologist** (Oct 2005 & Jan – Feb 2006), Department of Pathology, Rawalpindi Medical College & Pathology Clinical Laboratories Holy Family Hospital, Rawalpindi.

- **Professor of Microbiology & Immunology** (FFHP-HEC) (Mar 2006 to 31.05.2013), Department of Pathology, Rawalpindi Medical College & Consultant Microbiologist, Pathology Clinical Laboratories, Holy Family Hospital, Rawalpindi.
- **Member Faculty Committee in Microbiology** (Mar 2006 to date), University of Health Sciences, Lahore.
- **Head, Infection Control Committee**, Holy Family Hospital, Rawalpindi (Oct 2007 to date).
- **Adjunct Professor of Microbiology** (Aug 2008 to date), University of Health Sciences, Lahore.
- **Member, Board of Studies** (Feb 2009 to 2012), Department of Public Health, Faculty of Health Sciences, University of Azad Jammu & Kashmir, Muzaffarabad.
- **Member Board of Studies** (Jun 2009 to date), Department of Microbiology, Quaid-i-Azam University, Islamabad.
- **Professor of Pathology & Consultant Microbiologist** (Jun1, 2013-Dec 24, 2015). Department of Pathology, Sheikh Zayed Medical College/Hospital, Rahim Yar Khan.
- **Professor & Head, Department of Pathology (Microbiology)** (Dec 24, 2015 - 04.05.2017)**,** Rawalpindi Medical College and Allied Hospitals, Rawalpindi
- **Head & Consultant Microbiologist** (Dec 24, 2015 to date)**,** Pathology Clinical Laboratories, Benazir Bhutto Hospital & District Headquarters Hospital, Rawalpindi
- **Chairman Security Committee,** (to date) RMC New Teaching Block, Holy Family Hospital, Rawalpindi
- **Professor In charge/Director Libraries** (to date) Rawalpindi Medical College, Rawalpindi
- **Professor & Chairman, Department of Pathology** (May 5, 2017 to date)**,** Department of Pathology, Rawalpindi Medical University & Allied Hospitals, Rawalpindi
- **Dean Basic Sciences & Diagnostics** (May 5, 2017 to date)**,** Department of Pathology, Rawalpindi Medical University, Rawalpindi
- **Member Advance Studies and Research Board** (Jun 2017 to date)**,** Rawalpindi Medical University, Rawalpindi
- **Member Finance and Planning Committee** (Jun 2017 to date) Rawalpindi Medical University, Rawalpindi
- **Convener & Member, Curriculum Committee** (Oct 2017 to date), Rawalpindi Medical University, Rawalpindi
- **Director, Office of Research Innovation & Commercialization (ORIC)** (Jul 2019 to date), Rawalpindi Medical University & Allied Hospitals, Rawalpindi
- **Chairman, Antibiotic Usage Policy Committee** (Mar 2020 to date)**,** Rawalpindi Medical University & Allied Hospitals, Rawalpindi

- **Member, Career Counseling / Placement Committee** (Mar 2020 to date), Rawalpindi Medical University, Rawalpindi
- **Director Admin / Chairman, Telemedicine Centre for COVID-19** (Mar 2020 to date), Rawalpindi Medical University & Allied Hospitals, Rawalpindi
- **Member Committee for "Pakistan Randomized and Observatinal Trial to Evaluate Coronavirus Treatment (PROTECT)** (Mar 2020 to date) Rawalpindi Medical University & Allied Hospitals, Rawalpindi
- **Member Institutional Research Forum (IRF) / Ethical Review Board (ERB)** (Mar 2020 to date)

  Rawalpindi Medical University, Rawalpindi
- **Dean, Undergraduate Studies** (Jan 14 2021 to date) Rawalpindi Medical College & Allied Hospitals, Rawalpindi

RESEARCH PUBLICATIONS

1. **Akhtar N.** Eley A, Kinghorn GR, (**1989**). Simple transport medium for *Bacteroides ureolyticus.* European Journal of Clinical Microbiology & Infectious Diseases, 8:321-322.
2. Eley A, **Akhtar N**, Bennett KW, (**1990**). In vitro activity of ten antibiotics against clinical isolates of *Bacteroides ureolyticus.* Journal of Antimicrobial Chemotherapy, 25: 703-704.
3. **Akhtar N.** Lansbury G, Eley A, (**1992**). SDS-PAGE of *Bacteroides ureolyticus* isolated from the male genital tract. In, Duerden BI, Brasier J, Seddon SV, wade WG (eds). Medical and Environmental Aspects of Anaerobes, Wrightson Publishing Limited, Petersfield, UK p 44-49 (Presented at the VII International Symposium of the Society for Anaerobic Microbiology [Jul 18-20, 1991], Churchill College, University of Cambridge, UK).
4. **Akhtar N**, Eley A, (**1992**). Tetracycline resistance in *Bacteroides ureolyticus.* Journal of Antimicrobial Chemotherapy, 29: 600-601.
5. **Akhtar N**, Eley A, (**1992**). Restriction endonuclease analysis and ribotyping differentiate genital and non-genital strains of *Bacteroides ureolyticus*. Journal of Clinical Microbiology, 30: 2408-2414.
6. Eley A, **Akhtar N**, Oxley KM, (**1995**). Detection of plasmids in strains of *Bacteroides ureolyticus* isolated from non-genital abscesses & ulcers. In: Duerden BI, Wade WG, Brasier JS, Eley A, Wren B, Hudson MJ (eds). Medical and Dental Aspects of Anaerobes, Science Reviews Publishing, Northwood, UK, p 311-315.
7. **Akhtar N**, Eley A (**1995**). Variation in morphological characteristics of *Bacteroides ureolyticus* during preservation. In: Duerden BI, Wade WG, Brasier JS, Eley A, Wren B, Hudson MJ (eds). Medical and Dental Aspects of Anaerobes, Science Reviews Publishing, Northwood, UK, p 316-321.
8. **Akhtar N**, Khan AA, Khan HH, Ajmal M, Malik SA (**1997**). Bacteriology of chronic suppurative otitis media and antibiotic sensitivity patterns of the bacteria isolated. The Professional Medical Journal, 04; 3:246-250.

9. **Akhtar N**, Hayat A, Mahmood F (**1997**). Antibiotic susceptibility pattern of *Salmonella typhi* isolated from blood cultures in Rawalpindi. Journal of Rawalpindi Medical College, 1; 1:13-14.

10. **Akhtar N**, Khan AA, Khan HH, Khan IA (**1997**). Antibiotic susceptibility of 196 clinical isolates of *Staphylococcus aureus* isolated from wounds and abscesses of patients at Bahawalpur. Journal of Ayub Medical College, 9; 2:29-33.

11. **Akhtar N** (**1999**). In vitro activities of beta-lactams, quinolones and aminoglycosides against clinical isolates of *Pseudomonas aeruginosa*. Journal of Ayub Medical College, 11;2:17-19.

12. **Akhtar N** (**2000**). Urinary tract bacterial pathogens and their antimicrobial susceptibility patterns at Bahawalpur. The Professional Medical Journal, 7; 2: 131-137.

13. Mumtaz S, **Akhtar N**, Hayat A (**2002**). Antibiogram of aerobic pyogenic isolates from wounds and abscesses of patients at Rawalpindi. Pakistan Journal of Medical Research, 41; 1:16-18.

14. **Akhtar N** (**2002**). In vitro activity of penicillins, cephalosporins, aminoglycosides and aztreonam against clinical isolates of fluoroquinolone-resistant (FQR) aerobic gram-negative bacilli. Pakistan Journal of Medical Research, 41; 1:23-26.

15. Al-Jabre S, Al-Akloby OM, Al-Qurashi AR, **Akhtar N**, Al-Dossary A, Randhawa MA (**2003**). Thymoquinoe, an actuve principle of *Nigella sativa*, inhibited *Aspergillus niger*. Pakistan Journal of Medical Research, 42; 3:102-104.

16. Randhawa MA, Al-Akloby OM, Al-Jabre S, Al-Qurashi AR, **Akhtar N**. (**2005**). Thymoquinoe, an actuve principle of *Nigella sativa*, inhibited *Fusarium solani*. Pakistan Journal of Medical Research, 44; 1: 1-3.

17. Al-Zahrani AJ, **Akhtar N** (**2005**). Susceptibility patterns of Extended Spectrum ß-Lactamase (ESBL)-producing *Escherichia coli* and *Klebsiella pneumoniae* isolated in a teaching hospital. Pakistan Journal of Medical Research, 44; 2: 64-67.

18. Aljabre SHM, Randhawa MA, **Akhtar N**, Alakloby OM, Alqurashi AM and Aldossary A (**2005**). Antidermatophyte activity of ether extract of *Nigella sativa* and its active principle, thymoquinone. Journal of Ethnopharmacology 101;1-3: 116-119.

19. **Akhtar N,** Al-Zahrani AH (**2006**). Antbiotic resistance patterns of diarreagenic *Escherichia coli* (DEC) isolated from children under the age of 3 years in a teaching hospital in Saudi Arabia. Annals of Pakistan Institute of Medical Sciences 2(4); 218-221.

20. Al-Qurashi AM, **Akhtar N**, Al-Jabre S, AL-Akloby OM, Randhawa MA (**2007**). Anti-fungal activity of thymoquinone, an active principle of *Nigella sativa*, against a standard strain of *Aspergillus niger*. Scientific Journal of King Faisal University 8(1); 144-149.

21. **Akhtar N,** AL-Akloby OM, Al-Jabre SH, Al-Qurashi AM, Randhawa MA (**2007**). Comparison of antifungal activity of thymoquinone and amphotericin B against *Fusarium solani in vitro*. Scientific Journal of King Faisal University 8(2); 137-145.

22. Mumtaz S, Ahmad M, Aftab I, **Akhtar N**, ul Hassan M, Hamid A. (**2007**). Extended spectrum beta-lactamases in enteric gram-negative bacilli: related to age and gender. Journal of Ayub Medical College 19;(4): 107-11.

23. Mumtaz S, Ahmad M, Aftab I, **Akhtar N**, ul Hassan M, Hamid A. (**2008**). Aerobic vaginal pathogens and their sensitivity pattern. Journal of Ayub Medical College 20(1): 113-7.

24. Mumtaz S, Ahmad M, Aftab I, **Akhtar N**, Hamid A. (**2008**). *In vitro* comparative efficacy of carbapenems and β-lactam-β-lactamase inhibitor combinations against multidrug resistant gram-negative bacilli. Gomal Journal of Medical Sciences 6(1): 45-50.

25. Mumtaz S, Ahmad M, Aftab I, **Akhtar N**, Hamid A. (**2008**). Frequency of extended spectrum β-lactamases (ESBLs) and blood stream infections. Infectious Diseases Journal of Pakistan 17(2): 48-51.

26. Mumtaz S, Ahmad M, Aftab I, **Akhtar N**, Hamid A. (**2008**). Extended spectrum β-lactamase (ESBL) mediated resistance to third generation cephalosporins among *Escherichia coli*. Annals of Pakistan Institute of Medical Sciences 4(1); 18-22.

27. Mumtaz S, Ahmad M, Aftab I, **Akhtar N**, Hamid A. (**2008**). Extended spectrum β-lactamases in urinary gram-negative bacilli and their susceptibility pattern. Pakistan Journal of Medical Research 47(4):75-78.

28. **Akhtar N.** Alzahrani A, Obeid OE, Dassal D. **(2009)**. *In vitro* ciprofloxacin resistance patterns of Gram-positive bacteria isolated from clinical specimens in a teaching hospital. Journal of Ayub Medical College 21(3): 54-56.

29. Hussain MB, Hannan A, Fayyaz GQ, **Akhtar N**. (**2010**). Screening of Pakistani honeys for antibacterial potential against multi-drug resistant *Salmonella typhi*. Journal of ApiProduct and ApiMedical Science, 2 (1): 60.

30. Yameen MA, Nasim H, **Akhtar N**, Iram S, Javed I, Hameed A. **(2010).** Antibiotic susceptibility profile of methicillin-resistant Staphylococci isolated from nasal samples of hospitalized patients. African Journal of Microbiology Research, 4(3): 204-209**.**

31. Firdous R, Ahmed S, Chaudhry SA, **Akhtar N**. (**2010**). Evaluation of resistance to fluoroquinolones in clinical isolates of *Escherichia coli*. Medical Forum 21(5): 54-60.

32. **Akhtar N**, Alqurashi AM, Abutuwiba M. (**2010**). *In vitro* ciprofloxacin resistance profiles among gram-negative bacteria isolated from clinical specimens in a teaching hospital. Journal of Pakistan Medical Association 60(8):625-627.

33. **Akhtar N. (2010)**, Hospital-acquired infections in a medical intensive care unit. Journal of College of Physicians and Surgeons Pakistan 20(6): 386-390.

34. **Akhtar N. (2010)**, Staphylococcal nasal carriage of health care workers. Journal of College of Physicians and Surgeons Pakistan 20(7):439-443.

35. Zafar H, Dodhy M, Hayat A, **Akhtar N**, Rizwan F, Chaudhry B, Zareef S. (**2010**). Seroprevalence of Dengue Viral Infection in Healthy population residing in rural areas of district Rawalpindi. International Journal of Pathology 8(1): 13-15.

36. **Akhtar N**, Zaheer J, Rajput MY. (**2010**). Multi-resistant gram negative bacterial infections in patients in a surgical intensive care unit at Rawalpindi. Pakistan Journal of Medical Research 49(3): 58-62.

37. Chaudhry BZ, **Akhtar N.** Balouch AH **(2010).** Vaginal carriage rate of Group B Streptococcus in pregnant women and its transmission to the neonates. Journal of Ayub Medical College Abbotabad; 22(4): 168-171.

38. Firdous R, Safia A, Chaudhry SA, Ahmad A, **Akhtar N** (**2011**). Evaluation of resistance in clinical isolates of *E. coli, S. aureus* and *P. aeruginosa* against β-lactam antibiotics and gemtamicin. Journal of Rawalpindi Medical College (JRMC); 15(1):6-9.

39. Zafar H, Balouch AH, **Akhtar N**. (**2011**). Incidence of Primary dengue viral infection in healthy adults of Rawalpindi, Pakistan. Journal of Pakistan Medical Association, 61(10):1030.

40. Zafar H, **Akhtar N,** Tauseef K, Balouch AH, (**2012**). A cross sectional study to assess the association between pyrexia of unknown origin and primary dengue viral infection (serotype II) among <18 years age group. Isra Medical Journal, 4(2): 81-85.

41. Yameen MA, Iram S, Mannan A, Khan SA and **Akhtar N**, (**2013**). Nasal and perirectal colonization of vancomycin sensitive and resistant enterococci in patients of paediatrics ICU (PICU) of tertiary health care facilities. BMC Infectious Diseases 13:156 doi: 10.1186/1471-2334-13-156.

42. Zafar H, Balouch AH, **Akhtar N**, Tauseef K, Rizwan SF. (**2013**). Prevalence of undifferentiated fever in adults of Rawalpindi having primary dengue fever. Journal of Pakistan Medical Association, 63(6): 770-771.

43. Zafar H, Balouch AH, **Akhtar N**, Tauseef K, Ashraf HM. (**2013**). Seroprevalence of dengue fever (igg) in adults of Rawalpindi district. Isra Medical Journal, 5(2): 103-109.

44. Yasmin F, **Akhtar N**, Hameed A. (**2013**). *In vitro* synergistic effect of ciprofloxacin with aminoglycosides against multi-drug-resistant *Pseudomonas aeruginosa.* Pakistan Journal of Pharmaceutical Sciences 26(5): 1041-1044.

45. Hussain MB**,** Hannan A**, Akhtar N,** Fayyaz GQ**,** Imran M**,** Saleem S **and** Qureshi IA. **(2015).** Evaluation of the antibacterial activity of selected Pakistani honeys against multi-drug resistant *Salmonella typhi. BMC Complementary and Alternative Medicine* 2015, **15**:32 doi:10.1186/s12906-015-0549-z (Published: 26 February 2015)

46. Saleem S, Naseem N, Abdul Hannan, Nagi AH, Qamar MU and **Akhtar N.** (**2015**). Dose Related Histological Changes in Mouse Kidney After Administration of Manuka Honey. *Pakistan J. Zool., vol. 47(1), pp. 235-239, 2015.*

47. Aslam A, **Akhtar N**, Hasan F and Shah AA. (**2015**). Prevalence and in vitro susceptibility pattern of Candida species in a tertiary care hospital, Rawalpindi, Pakistan. *Pakistan J. Zool., vol. 47(2), pp. 335-342, 2015.*

48. Obaidullah, Khattak M, Hasan F, Raja N, Hussain S, **Akhtar N** and Shah AA. (**2015**). Vancomycin resistant enterococcal infections in tertiary care hospitals of Islamabad and Rawalpindi, Pakistan. *Pakistan J. Zool., vol. 47(1), pp. 235-239, 2015.*

49. Zafar H, **Akhtar N**, Bukhari KT and Lakhana NK. (**2016**). Antimicrobial susceptibility pattern of Linezolid to various clinical isolates. UK Journal of Pharmaceutical and Biosciences 4(6), pp. 06-11.

50. Khattak M, Nawaz S, Muhammad N, Jamal A, Akhtar S, Kamran R, **Akhtar N**, Hasan F and Shah AA. (**2017**). Prevalence of vancomycin-resistant enterococci from three tertiary care hospitals and role of *esp* gene in biofilm formation. Int J. Biosci, vol 10(3) pp24-34.

51. Mustafa RE, Mushtaq S, **Akhtar N** and Yameen MA. (**2019**). Assessment of knowledge, attitude and practice towards hepatitis among patients visiting the hepatitis clinic in tertiary care hospital, Rawalpindi, Pakistan. Journal of Pakistan Medical Association vol 69(8) pp.1136-1140.

52. Khan MI, Xu S, Ali MM, Ali R, Kazmi A, **Akhtar N**, Bilal M, Hu Yand Li F. (**2020**) Assessment of multidrug resistance in bacterial isolates from urinary tract-infected patients. Journal of

Radiation Research and Applied Sciences, 13:1, 267-275, DOI: 10.1080/16878507.2020.1730579.

53. Shahid R, Umar M, Zeb S, **Akhtar N**, Ali SM, Haider SI, Zaidi N, Ahmed M, Ahmad H, (**2020**). Telemedicine Services at Rawalpindi Medical University: An Initiative to Optimize Healthcare of the Patients During COVID-19 Pandemic. Research And Reviews On Healthcare: Open Access Journal, Lupine Publishers, LLC, vol. 5(3), pages 480-484, May.

COURSES, WORKSHOPS AND CONFERENCES ATTENDED

1. Orientation Course on Overseas Graduate Study (Jun 21 to Jul 30, **1987**). National Academy of Higher Education, University Grants Commission, Islamabad, Pakistan.
2. VI International Symposium of the Anaerobe Discussion Group (Jul 20-22, **1989**). Churchill College, University of Cambridge, Cambridge, UK.
3. VII International Symposium of the Society for Anaerobic Microbiology (Jul 18-20, **1990**). Churchill College, University of Cambridge, Cambridge, UK.
4. III International Symposium-Workshop on the Applications of DNA Technology to Agriculture and Health (Oct 25-28 **1992**). Center for Advanced Molecular Biology, University of the Punjab, Lahore, Pakistan.
5. WHO/NIH Workshop on Quality Assurance in Laboratory Medicine (Jan 13-14, **1993**). National Institute of Health, Islamabad, Pakistan.
6. Workshop on HIV/AIDS Surveillance (Oct 2-4, **1993**). WHO Collaboration Center in Viral Diagnostics, National Institute of Health, Islamabad, Pakistan.
7. XVII Annual Conference of Pakistan Association of Pathologists (Nov 9-11, **1993**). Armed Forces Institute of Pathology, Rawalpindi, Pakistan.
8. Workshop on "Educational Planning and Development" (Mar 3-6, **1997**). Department of Medical Education and National Teachers Training Center, WHO Collaborating Center for Research & Training in Educational Development, College of Physician and Surgeons Pakistan, Karachi, Pakistan.
9. Workshop on "Nursing, Counseling and Social Support of HIV/AIDS Patients (Aug 4-6, **1997**). National AIDS Prevention and Control Program, National Institute of Health, Islamabad, Pakistan.
10. First National Conference of Rawalpindi Medical College (Apr 30-May 2, **1997**), Rawalpindi, Pakistan.
11. Symposium on Thalassemia (April 4, **1998**), Rawalpindi Medical College, Rawalpindi, Pakistan.
12. International Scientific Conference of Rawalpindi Medical College (Dec 15-17, **1998**), Rawalpindi, Pakistan.
13. Workshop on "Development and Administration of MCQs and Essay Questions" (May 25-27, **2000**). Department of Medical Education and National Teacher Training Center, WHO Collaborating Center for Research & Training in Educational Development, College of Physician and Surgeons Pakistan. At MCH Center, Pakistan Institute of Medical Sciences Islamabad, Pakistan.

14. Workshop on “Objective Structured Clinical Examination” (Jun 07-09, **2000**). Department of Medical Education and National Teachers Training Center, WHO Collaborating Center for Research & Training in Educational Development, College of Physician and Surgeons Pakistan. At MCH Center, Pakistan Institute of Medical Sciences Islamabad, Pakistan.

15. Symposium on “Allergic Diseases in Adults and Children” (Nov 01, **2000**). Al-Mouwasat Dispensary, Jubail Industrial City, Saudi Arabia.

16. Second GCC Conference of Faculties of Medicine (Nov 15-16, **2000**). King Faisal University, College of Medicine, Dammam, Saudi Arabia.

17. Seminar on “Clinician and Laboratory Physician: Basis for Better Diagnosis and Management” (May 30, **2001**). Dammam Regional Lab, Ministry of Health, Saudi Arabia.

18. Symposium on “Prevention of Nosocomial Infections in Outpatient PHC’S and Dental Clinics” (Jan 29, **2002**). Directorate of Health Eastern Province, Dammam, Saudi Arabia.

19. Symposium on “4th Infectious Diseases Update: Hospital Infections” (Mar 27-28, **2002**). Department of Microbiology & Directorate of Medical Education, College of Medicine, King Faisal University, Dammam, Saudi Arabia.

20. Seminar on “The Latest Developments in Electron Microscopy: Environmental Scanning Electron microscopy (ESEM) & Transmission Electron Microscopy (TEM)” (April 9, **2002**). Fel Company, Dahran International Hotel, Dahran, Saudi Arabia.

21. Symposium on “Antimicrobial Resistance Awareness Day: Prevention, Management and Control” (May 16, **2002**). Qatif Central Hospital, Ministry of Health, Saudi Arabia.

22. Symposium on “The Medical Ethics in Islam How Different?” (March 10-12, **2003**). Health Outreach & Business Affairs, King Faisal Specialist Hospital & Research Center, Riyadh, Saudi Arabia.

23. Bimonthly Scientific Meetings of Microbiology & Infectious Disease Club, Eastern Province (Academic Year **2002-2003**), Saudi Arabia..

24. Workshop on “Trends in Microbiology” (Mar 24-25, **2004**). Department of Microbiology & Directorate of Medical Education, College of Medicine, King Faisal University, Dammam, Saudi Arabia.

25. Workshop on "Tutoring Skills in Problem-based Learning" (December 23, **2004**). Directorate of Medical Education & Training, College of Medicine, King Fahd Hospital of the University, King Faisal University, Dammam, Saudi Arabia.

26. Bimonthly Scientific Meetings of Microbiology & Infectious Disease Club, Eastern Province (Academic Year **2003-2004**), Saudi Arabia..

27. Symposium on "New Advances in Laboratory Examination of Expatriates Entering Saudi Arabia" (Mar 21, **2005**). Ministry of Health, Eastern Province Saudi Arabia.

28. Bimonthly Scientific Meetings of Microbiology & Infectious Disease Club, Eastern Province (Academic Year **2004-2005**), Saudi Arabia.

29. Scientific Meeting on “What is Avian Influenza?” Saudi Society for Microbiology & Infectious Diseases (November 24, **2005**). Hotel Al-Gosaibi, Khobar, Saudi Arabia.

30. Workshop on “Quality Assurance in Higher Education” (Mar 20, **2006**), Pakistan Institute of Quality Control at Shalimar Hotel, Rawalpindi, Pakistan.

31. Workshop on "Teaching Skills" (Dec **2006**). Department of Medical Education, Rawalpindi Medical College, Rawalpindi, Pakistan.

32. Workshop on "Basics of Assessment" (Mar **2007**). Department of Medical Education, Rawalpindi Medical College, Rawalpindi, Pakistan.

33. Sixth International Biennial Conference of Pakistan Society for Microbiology (Mar 18-21, **2007**), National Library of Pakistan, Islamabad, Pakistan.

34. Workshop on "Research Methodology, Biostatistics & Medical Writing" (Dec 26-29, **2007**). Department of Medical Education and National Teachers Training Center, WHO Collaborating Center for Research & Training in Educational Development, College of Physician and Surgeons Pakistan. Regional Office, Pakistan Institute of Medical Sciences Islamabad, Pakistan.

35. Organized & attended "Infection Control Awareness Week (11th to 16th Feb, **2008**)" organized by Infection Control Committee, Holy Family Hospital, Rawalpindi, Pakistan.

36. Workshop on "Assessment of Competence" (Feb 26-29, **2008**). Department of Medical Education and National Teachers Training Center, WHO Collaborating Center for Research & Training in Educational Development, College of Physician and Surgeons Pakistan. Regional Office, Pakistan Institute of Medical Sciences Islamabad, Pakistan.

37. Workshop on "Supervisory Skills" (Mar 18-22, **2008**). Department of Medical Education and National Teachers Training Center, WHO Collaborating Center for Research & Training in Educational Development, College of Physician and Surgeons Pakistan. Regional Office, Pakistan Institute of Medical Sciences Islamabad, Pakistan.

38. International Conference on Medical Education (Jan 26-27, **2009**). Riphah Academy of Research and Education, Ripha International University, Islamabad in collaboration with PM&DC and Higher Education Commission of Pakistan.

39. Organized & attended "Infection Control Awareness Week (Mar 24-28, **2009**)" organized by Infection Control Committee, Holy Family Hospital, Rawalpind, Pakistan.

40. Workshop on "Facilitation Enhancement" (Jul 13-14, 2009). Department of Medical Education, Rawalpindi Medical College, Rawalpindi, Pakistan.

41. Workshop on "Statistical Package for Social Sciences" (Oct 29, **2009**). Organized by PharmEvo Pharmaceuticals and Research Cell Rawalpindi Medical College, Rawalpind, Pakistani.

42. 33rd National Conference of Pakistan Association of Pathologists (Nov 6-8, **2009**). Pakistan Institute of Medical Sciences, Islamabad, Pakistan.

43. Seminar on "Hepatitis Prevention & Control" (**Nov**, **2014**). Organized by Health Department, Government of the Punjab, Lahore, Pakistan.

44. Workshop on "Key Concepts in Medical Education, Educational Leadership and Professionalism" **(Feb 2**, **2015**). Organized by Department of Medical Education, Sheikh Zayed Medical College, Rahim Yar Khan. Venue H. H. Sheikh Khalifa Institute of Allied Health Sciences, SZMC, Rahim Yar Khan, Pakistan.

45. CME Seminar on "Transfusion transmitted Infections" & "Histopathology pattern of endometrium in patients with abnormal uterine bleeding" & "Antenatal screening of Down's

syndrome and inborn errors of metabolism" (**Mar 18, 2015**). Organized by Department of Pathology, Agha Khan University Hospital, Karachi. Venue: Desert Palm Hotel, Rahim Yar Khan, Pakistan.

46. Workshop on "Biosafety in Pakistan- Challenges and Solutions" (**Apr 18, 2015**). Organized jointly by Pathology Department, Sheikh Zayed Medical College, Rahim Yar Khan and The American Society for Microbiology. Venue H. H. Sheikh Khalifa Institute of Allied Health Sciences, SZMC, Rahim Yar Khan, Pakistan.
47. Workshop on "Medical Writing" (**May 20, 2015**). Organized by Department of Medical Education, Sheikh Zayed Medical College, Rahim Yar Khan in collaboration with Pakistan Association of Medical Editors & Health Research Advisory Board. Venue H. H. Sheikh Khalifa Institute of Allied Health Sciences, SZMC, Rahim Yar Khan, Pakistan.
48. Workshop on "Medical Editing & Peer review" (**May 21, 2015**). Organized by Department of Medical Education, Sheikh Zayed Medical College, Rahim Yar Khan in collaboration with Pakistan Association of Medical Editors & Health Research Advisory Board. Venue H. H. Sheikh Khalifa Institute of Allied Health Sciences, SZMC, Rahim Yar Khan.
49. Workshop on "Latest Trends in Diagnosis of Tuberculosis" (**August 30, 2016**). Armed Forces of Pathology (AFIP), Rawalpindi, Pakistan
50. Two Days Training Workshop on "Serological Diagnosis of Crimean Congo Hemorrhagic Fever" (**Sep 7-8, 2016**). Institute of Public Health, Lahore, Pakistan.
51. Workshop on "Microbiology Quality Control & Biosafety" (**Nov 28-29, 2016**). Organized jointly by Pathology Department, Sheikh Zayed Medical College, Rahim Yar Khan and The American Society for Microbiology. Venue H. H. Sheikh Khalifa Institute of Allied Health Sciences, SZMC, Rahim Yar Khan, Pakistan.
52. Workshop on "Infection Control Awareness" (**Mar 20, 2017**). Organized by Department of Pathology, Rawalpindi Medical College, Rawalpindi.
53. 3rd International Scientific Conference of Rawalpindi Medical College, Rawalpindi, Pakistan (**Mar 24-25, 2017**). Venue: Rawalpindi Medical College, new Teaching Block, Rawalpindi, Pakistan.
54. A seminar and workshop on "Infection Prevention and Control" (**Jan 8, 2018**) at Faletti's Hotel, Lahore. Organized by Pakistan Kidney and Liver Institute and Research Center, Lahore.
55. A training course on "Laboratory Quality Management System (LQMS)" organized by CDC, USA, WHO, EMRO & NIH, Islamabad (**June 25-29, 2018**). Venue: Hotel RAMADA, Islamabad.
56. Organized and attended a series of International Guest Speaker Lectures on "Quality Assurance in Laboratory Medicine & Research Ethics and Paper Writing" by Dr. Adil I. Khan, Director Point of Care Testing & Clinical Chemistry, Temple University & Episcopal Hospitals, Philadelphia, USA (**June 26 to July 05, 2018**). Venue: RMU & Allied Hospitals, Rawalpindi.
57. Organized and completed training course on "Infection Prevention and Control in Hospitals = 07 CME credit hours" (**July 12 to 19, 2018**) by Infection Prevention and Control Program, Rawalpindi Medical University, Rawalpindi. Venue: Holy Family Hospital, Rawalpindi.

58. Workshop on “Basics of Medical Education” (**Aug 20 to 21, 2019**), Department of Medical Education, Rawalpindi Medical College, new Teaching Block, Rawalpindi, Pakistan.

59. Workshop on “Table of Specifications” (**Aug 27, 2019**), Department of Medical Education, Rawalpindi Medical College, New Teaching Block, Rawalpindi, Pakistan

60. Workshop on “Leadership in Healthcare” (**Oct 9 to 10, 2019**), Department of Medical Education, Rawalpindi Medical College, New Teaching Block, Rawalpindi, Pakistan

61. 10th Public Health Conference on “Tackling Inequities in Health”, (**Dec 2-3, 2019**) Health Services Academy, Ministry of National Health Service, Regulations and Coordination, Government of Pakistan

62. “Virtual AMR Basics Training Workshop” (**June 29 to July 3, 2020**) conducted by National Institute of Health in collaboration with Fleming Fund

PRESENTATIONS IN CONFERENCES & SYMPOSIA

1. **Akhtar N.** Lansbury G, Eley A, (1992). SDS-PAGE of *Bacteroides ureolyticus* isolated from the male genital tract. VII International Symposium of the Society for Anaerobic Microbiology (Jul 18-20, 1991), Churchil College, University of Cambridge, UK).

2. **Akhtar N** (1993). Nucleic Acid Probes: Their uses in Research and Clinical Laboratories. XVII Annual Conference of Pakistan Association of Pathologists (Nov 9-11, 1993). Armed Forces Institute of Pathology, Rawalpindi.

3. **Akhtar N** (Feb 1996). Recent Advances in Laboratory Diagnosis of Tuberculosis. Delivered in a seminar on”Tuberculosis 96”. Quaid-I-Azam Medical College, Bahawalpur, Pakistan.

4. **Akhtar N** (Apr 1999). Semen analysis and its importance in male infertility. Delivered in a four days “workshop on various aspects of male infertility”. Behbud Association of Pakistan, Rawalpindi.

5. **Akhtar N** (Nov 7, 2001). Anti-TB Drugs Resistance. Bimonthly meeting of Microbiology & Infectious Diseases Club, Eastern Province, Saudi Arabia. Dahran International Hotel, Al-Khobar, Saudi Arabia.

6. **Akhtar N** (Mar 27-28, 2002). High Level Disinfection or Sterilization of Flexible Endoscopes. Delivered at “Symposium on 4th Infectious Diseases Update: Hospital Infections”. Department of Microbiology & Directorate of Medical Education, College of Medicine, King Faisal University, Dammam, Saudi Arabia.

7. **Akhtar N** (May 16, 2002). Mechanisms of Antimicrobial Resistance. Delivered at “Symposium on Antimicrobial Resistance Awareness Day: Prevention, Management and Control” Qatif Central Hospital, Ministry of Health, Saudi Arabia.

8. **Akhtar N** (Mar 21, 2005). Recent Advances in Laboratory Diagnosis of Gonorrhea. Delivered at "Symposium on "New Advances in Laboratory Examination of Expatriates Entering Saudi Arabia", Ministry of Health, Eastern Province Saudi Arabia.

9. **Akhtar N** (Feb 12th & 14th 2008). Hospital acquired Infections. Delivered at “Infection Control Awareness Week (11th to 16th Feb, 2008)” organized by Infection Control Committee, Holy Family Hospital, Rawalpindi.

10. **Akhtar N** (Mar 24th 2009). Hospital acquired Infections practices at Holy Family Hospital, Rawalpindi. Delivered at "Infection Control Awareness Week (24th to 28th Mar, 2009)" organized by Infection Control Committee, Holy Family Hospital, Rawalpindi.

11. **Akhtar N**. Staphylococcal nasal carriage of health care workers; fluorquinolones an option for decolonization. Presented at 33rd National Conference of Pakistan Association of Pathologists (Nov 6-8, 2009). Pakistan Institute of Medical Sciences, Islamabad.

12. Hussain MB, Hannan A, Fayyaz GQ, **Akhtar N**. Screening of Pakistani honeys for antibacterial potential against multi-drug resistant *Salmonella typhi*. Presented at 2nd International Conference on the Medicinal Use of Honey, Kota Bharu, Malaysia, (Jan 13-16, 2010).

13. Organized and presented a topic entitled "Introduction to infection Prevention & Control Program at RMU & Allied Hospitals at a training course on "Infection Prevention and Control in Hospitals = 07 CME credit hours" (**July 12 to 19, 2018**) by Infection Prevention and Control Program, Rawalpindi Medical University, Rawalpindi. Venue: Holy Family Hospital, Rawalpindi.

14. Guest Speaker Lecture on "Experiences of Infection Control Practices at RMU Allied Hospitals" at a seminar on Infection Control (**Jan 23, 2019**). Organized by Department of Pathology, Wah Medical College, Wah Cantt, Pakistan.

SUPERVISOR / CO-SUPERVISOR FOR PHD IN MICROBIOLOGY

Supervisor/Co-supervisor for following PhD students in Microbiology at Quaid-i-Azam University, Islamabad & University of Health Sciences, Lahore.

PhD AWARDED

8. Co-supervisor for Dr. Shamim Mumtaz, Professor of Microbiology, Department of Pathology, Islamabad Medical & Dental College, Islamabad. PhD Research Project entitled **"***Beta-lactam antibiotic resistance patterns and its development in indigenous clinical isolates" (**PhD degree awarded 2008 by Quaid-i-Azam University, Islamabad**)*

9. Co-supervisor for Dr. Rukhsana Firdous, Assistant Professor of Microbiology, Department of Pathology, Rawalpindi Medical College, Rawalpindi. PhD Research Project entitled *"Evaluation of resistance to fluoroquinolones in clinical isolates of Escherichia coli, Staphylococcus aureus, and Pseudomonas aeruginosa" (**PhD awarded Jan 2010 by Quaid-i-Azam University, Islamabad**)*

10. Co-supervisor for M r. M. Arafat Yameen, Assistant Professor, COMSATS Institute, Abbotabad. PhD Research Project entitled *"Study on Methicillin-resistant Staphylococcus aureus and Vancomycin-resistant Enterococci co-colonization in patients of Intensive care Units of Tertiary Health Care facilities (Hospitals)" (**PhD awarded Oct 2011 by Quaid-i-Azam University, Islamabad**)*

11. Supervisor for Dr. Muhammad Barakaat Hussain, Department of Microbiology, University of Health Sciences, Lahore. PhD Research Project entitled *"Screening of Pakistani Honeys for Antibacterial Potential against Salmonella typhi". (**PhD awarded Aug 2012 by University of Health Sciences, Lahore**)*

12. Supervisor for Dr. Sidra Saleem, Assistant Professor, Department of Microbiology, University of Health Sciences, Lahore. PhD Research Project entitled *"Efficacy of Honey against methicillin resistant Staphylococcus aureus systemic infection in mouse model*". ***(PhD awarded Aug 2013 by University of Health Sciences, Lahore)***

13. Co-supervisor for Mrs. Ayesha Aslam, PhD Research Project entitled *"Prevalence of different candida species isolated from patients from ICU-settings of tertiary-care hospitals and their antifungal susceptibility pattern"* ***(PhD awarded Sep 2016 by Quaid-i-Azam University, Islamabad)***

14. Supervisor for Mrs. Saira Erum. PhD Research Project entitled *"In vitro antibacterial activity of zinc nanoparticles against clinical isolates of methicillin-resistant Staphylococcus aureus (MRSA)*" Quaid-i-Azam University, Islamabad ***(PhD awarded Apr 2017 by Quaid-i-Azam University, Islamabad)***

SUPERVISOR/CO-SUPERVISOR FOR M. PHIL IN MICROBIOLOGY

Research work for following MPhil students in Microbiology at Quaid-i-Azam University, Islamabad carried out under my supervision

MPHIL AWARDED

6. Miss Hina Nasim Khan. MPhil Research Project entitled *"Antibiotic resistance patterns of Methicillin-Resistant Staphylococcus aureus and Staphylococcus epidermidis".* ***(MPhil degree awarded 2008 by QAU, Islamabad)***

7. Miss Firdous Yasmin. MPhil Research Project entitled *"Antibiotic resistance patterns of Pseudomonas aeruginosa*". ***(MPhil degree awarded 2008 by QAU, Islamabad)***

8. Miss Nosheen Akram. MPhil Research Project entitled *"Prevalence of post-operative wound infections in patients with gynecological and obstetrics surgery and antibiogram of the bacteria isolated'*. ***(MPhil degree awarded 2009 by QAU, Islamabad)***

9. Miss Arsala. MPhil Research Project entitled "*Prevalence of indwelling devices related infections and antibiogram of the bacteria isolated*". ***(MPhil degree awarded 2009 by QAU, Islamabad)***

10. Miss Kanwal. Research project entitled "Evaluation of frequency of MDR-tuberculosis in patients with primary pulmonary tuberculosis". (***MPhil degree awarded 2011 by QAU, Islamabad***)

MPhil in Microbiology at Rawalpindi Medical College and Allied Hospitals in affiliation with University of Health Sciences, Lahore

Supervise course and research work for MPhil Microbiology students since 2007.

SUPERVISOR FOR BS (Hons)-MLT IN MICROBIOLOGY

BSc (Hons)-MLT in Microbiology (12 candidates) at Rawalpindi Medical College and Allied Hospitals in affiliation with University of Health Sciences, Lahore

1. Muhammad Umer. BSc-MLT Research Project entitled “Molecular characterization of methicillin-resistant Staphylococcus aureus” (***Degree awarded 2012***).
2. Ammar Ahmed. BSc-MLT Research Project entitled “Prevalence of ESBL-positive enterobactericiae from clinical isolates and their antimicrobial sensitivity pattern in Holy Family Hospital, Rawalpindi, Pakistan” (***Degree awarded 2012***).
3. Miss Anum Tanveer. BSc-MLT Research Project entitled “Association of contaminated mobiles of doctors, nurses and patients with the post operative wound infections in surgical units”. (***Degree awarded 2013***).
4. Miss Ummara Kaleem. BSc-MLT Research Project entitled “Association of hand washing practices of patients on post operative wound infections in surgical units”. (***Degree awarded 2013***).
5. Zakir Ullah. Association of *Staphylococcous aureus* nasal carriage in staff and post surgical wound infection rate in patients of surgical units’. ***(Degree awarded 2013)***
6. Miss Amaila Qaisar. BSc-MLT Research Project entitled “Prevalence of bacteria in surgical site infections and their antibiotic susceptibility pattern in surgical units” ***(Degree awarded 2013)***
7. Miss Sobia Ambreen. BSc-MLT Research Project entitled “Vaginal colonization of females during third trimester of pregnancy by Escherichia *coli* and group B streptoccoci in Gynae and Obs department”. ***(Degree awarded 2013)***
8. Miss Mehreen Bashir. BSc-MLT Research Project entitled “Prevalance of bacterial vaginosis and candidiasis in pregnant women during third trimester of pregnancy. ***(Degree awarded 2013)***
9. Miss Tahira Yasmin. BSc-MLT Research Project entitled “Bacteriology of urinary tract infection in females during 3rd trimester of pregnancy”. ***(Degree awarded 2013)***
10. Miss Tusma Hanif. BSc-MLT Research Project entitled “Frequency of multidrug resistant *Escherichia coli* causing urinary tract infections in pregnant women”. ***(Degree awarded 2013)***
11. Miss Maryam Sharif. BSc-MLT Research Project entitled “Seroprevalence of syphilis in patients with infertility at Holy Family Hospital”. ***(Degree awarded 2013)***
12. Muhammad Wajahat. BSc-MLT Research Project entitled “Comparison of routine and concentration techniques on microscopic examination of stool for detection of ova and cysts”. ***(Degree awarded 2013)***
13. Miss Nighat Parveen. BSc-MLT Research Project entitled “Effect of saline washing of sputum on routine culture at Holy Family Hospital”. ***(Degree awarded 2013)***
14. Hamid Usman. BSc-MLT Research Project entitled “Comparison of Z-N staining using direct smear preparation and concentration technique”. ***(Degree awarded 2013)***

REVIEWER FOR SCIENTIFIC JOURNALS & RESEARCH PROJECTS

1. Reviewer of research projects submitted for funding to **The King Abdul-Aziz City for Science & Technology**, Jeddah, Saudi Arabia.

2. Reviewer for research articles submitted for publication in:
   - **Saudi Medical Journal**, Riyadh, Saudi Arabia.
   - **Annals of Saudi Medicine**, Riyadh, Saudi Arabia.
   - **Annals of Pakistan Institute of Medical Sciences,** Islamabad, Pakistan
   - **Journal of Islamic International Medical College**, Rawalpindi, Pakistan
   - **Journal of Rawalpindi Medical College (JRMC),** Rawalpindi, Pakistan
   - **Pakistan Journal of Pathology,** Rawalpindi, Pakistan
   - **Journal of Islamabad Medical & Dental College,** Islamabad, Pakistan

FUNDED RESEARCH PROJECTS

3. **Co-investigator** in a research project entitled "*Activity of thymoquinone and Nigella sativa against dermatophytes, Aspergillus and Fusarium*" **completed in 2004**. (Funded by King Faisal University, Dammam, Saudi Arabia).

4. **Principal Investigator** in a research project entitled "*Study of prevalence of Neisseria gonorrhoeae and Chlamydia trachomatis infection in pregnant women in a teaching hospital*" **completed in 2006** (Funded by King Faisal University, Dammam, Saudi Arabia).

5. **Principal Investigator** in a research project entitled "*Determination of relationship of bacterial carriage by hospital staff, hospital acquired infections and antibiotic resistance patterns of bacterial isolates in a tertiary care hospital to develop hospital antibiotic po*licy" **completed in May 2008** (Funded by Department of Human Resource Development, Higher Education Commission, Islamabad, Pakistan).

6. **Principal Investigator** in a research project entitled "*Evaluation of status of antibiotic resistance patterns of mycobacteria isolated from patients with pulmonary tuberculosis to develop strategies for effective treatment of tuberculosis*" **completed in May 2013. (**Funded by Department of Research and Development, Higher Education Commission, Islamabad, Pakistan)

RESEARCH EXPERIENCE (PhD THESIS)

Title: Characterization of *Bacteroides ureolyticus* by SDS-PAGE, Plasmid-fingerprinting, and DNA-rRNA hybridization.

1. Characterization by biochemical testing.
2. SDS-PAGE (Sodium Dodecyl Sulphate-Polyacrylamide Gel Electrophoresis of whole-cell bacterial proteins.
3. Isolation and fingerprinting of bacterial plasmids.
4. Isolation and purification of chromosomal DNA and cutting with restriction endonucleases.
5. Agarose gel electrophoresis of the digested DNA fragments and characterization by different banding patterns.
6. Southern blotting of the separated DNA fragments and hybridization with ^{32}P-labeled rRNA probes.

RESEARCH INTERESTS

1. Study of antimicrobial susceptibility patterns of bacterial pathogens for suitable empirical therapy of bacterial infections.

2. Hospital Acquired Infections and Hospital Antibiotic Policies.

EXTERNAL EXAMINER FOR PHD & M. PHILTHESES EVALUATION AND VIVA VOCE EXAMINATIONS

Quaid-e-Azam University, Islamabad
University of Health Sciences, Lahore
Dow University of Health Sciences, Karachi

PhD Students

1. External Examiner for Mr. Muhammad Suleman (PhD Microbiology Student) Quaid-i-Azam University Islamabad (Viva conducted on January 16, **2018**).
2. External Examiner for Ms. Fouzia Nahid (PhD Microbiology Student) Quaid-i-Azam University Islamabad (Viva conducted on March 04, **2018**).
3. External Examiner for Mr. Sajid Ali (PhD Microbiology Student) Quaid-i-Azam University Islamabad (Viva conducted on April 30, **2018**).
4. Thesis Evaluation & viva examiner for Mr. Muhammad Usman Qamar (PhD Microbiology Student) University of Health Sciences Lahore (Thesis Evaluation Report on May 21, **2018**).
5. External Examiner for Ms. Ifra Ghouri (PhD Microbiology Student) Quaid-i-Azam University Islamabad (Viva conducted on Dec 10, **2019**).
6. External Examiner for Ms. Salma Ghulam Nabi (PhD Microbiology Student, research entitled *"Association of IL28B genetic variation with spontaneous clearance of Hepatitis C Virus Treatment Response"*) Quaid-i-Azam University Islamabad (Viva conducted on Dec 17, **2019**).
7. External Examiner for Ms. Zara Rafaque (PhD Microbiology Student, research entitled *"Distribution of virulence factors among multidrug-resistant isolates of uropathogenic Escherichia coli"*) Quaid-i-Azam University Islamabad (Viva conducted on Jan 2, **2020**).
8. External Examiner for Mr. Shahid Zaman (PhD Microbiology Student, research entitled *"Development of Microbial based probiotic feed supplement and evaluation of its impact on growth production and health of dairy cattles"*) Quaid-i-Azam University Islamabad (Viva conducted on Jan 20, **2021**).

M. Phil Students

1. External Examiner for Ms. Zahra Jabeen (M. Phil Microbiology Student) Quaid-i-Azam University Islamabad (Viva conducted on August 21, **2014**).
2. External Examiner for Mr. Meeraj Kumar (M. Phil Microbiology Student) Quaid-i-Azam University Islamabad (Viva conducted on August 25, **2014**).
3. External Examiner for Ms. Flora Farrukh (M. Phil Microbiology Student) Quaid-i-Azam University Islamabad (Viva conducted on September 19, **2014**).
4. External Examiner for Mr. Shahid Ali (M. Phil Microbiology Student) Quaid-i-Azam University Islamabad (Viva conducted on April 14, **2015**).
5. External Examiner for Ms. Bibi Malala (M. Phil Microbiology Student) Quaid-i-Azam University Islamabad (Viva conducted on April 05, **2016**).
6. Thesis Evaluation for Dr. Fazal-ur-Rehman (M. Phil Microbiology Student) University of Health Sciences Lahore (Thesis Evaluation Report on May 24, **2016**).

7. External Examiner for Ms. Tahira Yasmeen (M. Phil Microbiology Student) Quaid-i-Azam University Islamabad (Viva conducted on September 06, **2016**).
8. Thesis Evaluation for Ms. Samina Baid (M. Phil Student) Dow University of Health Sciences Karachi (Thesis Evaluation Report on December 02, **2016**).
9. External Examiner for Ms. Shazia Nazeer (M. Phil Microbiology Student) Quaid-i-Azam University Islamabad (Viva conducted on March 21, **2017**).
10. External Examiner for Mr. Nadeem Khan (M. Phil Microbiology Student) Quaid-i-Azam University Islamabad (Viva conducted on April 12, **2017**).
11. External Examiner for Mr. Muhammad Faraz (M. Phil Microbiology Student) Quaid-i-Azam University Islamabad (Viva conducted on May 04, **2017**).
12. External Examiner for Ms. Hira Iqbal (M. Phil Microbiology Student) Quaid-i-Azam University Islamabad (Viva conducted on September 06, **2017**).
13. External Examiner for Ms. Shermeen Akis (M. Phil Microbiology Student) Quaid-i-Azam University Islamabad (Viva conducted on September 12, **2017**).
14. Thesis Evaluation for Mr. Javid Iqbal (M. Phil Microbiology Student) University of Health Sciences Lahore (Thesis Evaluation Report on February 17, **2018**).
15. Thesis Evaluation for Ms. Hafiza Noor-ul-Huda (M. Phil Microbiology Student) Dow University of Health Sciences Karachi (Thesis Evaluation Report on April 26, **2018**).
16. Thesis Evaluation for Mr. Javaid Iqbal (M. Phil Microbiology Student) University of Health Sciences Lahore (Thesis Evaluation Report on June 01, **2018**).
17. Thesis Evaluation for Ms. Fizza Mushtaq (M. Phil Microbiology Student) University of Health Sciences Lahore (Thesis Evaluation Report on August 13, **2018**).
18. Thesis Evaluation for Ms. Ambreen Khokhar (M. Phil Molecular Pathology Student) Dow University of Health Sciences Karachi (Thesis Evaluation Report on September 03, **201**8).
19. External Examiner for Ms. Aroosa Aftab (M. Phil Microbiology Student) Quaid-i-Azam University Islamabad (Viva conducted on October 29, **2018**).
20. External Examiner for Mr. Mati Ullah (M. Phil Microbiology Student) Quaid-i-Azam University Islamabad (Viva conducted on November 19, **201**8).
21. External Examiner for Mr. Adil Muhammad (M. Phil Microbiology Student) Quaid-i-Azam University Islamabad (Viva conducted on November 20, **2018**).
22. External Examiner for Ms. Muneela Shaheen (M. Phil Microbiology Student) Quaid-i-Azam University Islamabad (Viva conducted on April 30, **2019**)
23. External Examiner for Ms. Javeria (M. Phil Microbiology Student) Quaid-i-Azam University Islamabad (Viva conducted on April 30, **2019**).
24. External Examiner for Ms. Ayesha Khalid Butt (M. Phil Microbiology Student) Quaid-i-Azam University Islamabad (Viva conducted on August 19, **2019**).
25. External Examiner for Ms. Areeta Fatima (M. Phil Microbiology Student) Quaid-i-Azam University Islamabad (Viva conducted on August 19, **2019**).
26. External Examiner for Ms. Muska Khattak (M. Phil Microbiology Student) Quaid-i-Azam University Islamabad (Viva conducted on November 14, **2019**). *Title: Screening of blaOXA-1 and blaTEM Genes in fluoroquinolone-resistant strains of Pseudomonas aeruginosa*.
27. External Examiner for Ms. Summayya Kanwal (M. Phil Microbiology Student) Quaid-i-Azam University Islamabad (Viva conducted on November 14, **2019**). *Title: PCR based screening of periodontal pathogens in fasting and non-fasting oral healthcare providers.*

Curriculum Vitae

Dr. SHIREEN RAFIQ

PERSONAL BIO-DATA

Nationality	Pakistan
Date of Birth	29.09.1961
Telephone office	092 051-9290329 ext 2089
Mobile	092-323-5141577
E-mail	shireen7862001@yahoo.com and shireen7862001@gmail.com
PMDC registeration no	12885-P

QUALIFICATIONS

Doctor of Philosophy (Ph.D. Microbiology) 2014
Institute: Quaid-i-Azam University,Islamabad, Pakistan
Dissertation: Bacterial Vaginosis; in married female hospital population
Master of Philosophy (M.Phil.)
2004 **Institute:** Quaid-iAzam University, Islamabad,Pakistan
Dissertation: Clomiphene citrate for induction of ovulation
CGPA: 3.8
Bachelor of Medicine, Bachelor of Surgery (MBBS) 1985
Institute: Rawalpindi Medical College (RMC), Rawalpindi, Pakistan
Division: 1st
Bachelors in Science (BSC) 1983
Institute: Punjab University, Lahore. Pakistan
Higher Secondary School Certificate Examination 1979
Institute: FG College for Women Rawalpindi
Major: Pre-Medical
Division: 1st
Secondary School Certificate Examination 1977
Institute:FG Sir Syed Girls Secondary School Rawalpindi, Pakistan
Major: Science
Division: 1st

WORK EXPERIENCE

Rawalpindi Medical University (RMU)-Rawalpindi.

Microbiologist **2017-present**

- Incharge Microbiology section Pathology Department Holy Family Hospital
- Supervisor BSc honors MLT Program Allied Health Sciences RMU
- Member infection control committee RMU and Allied Hospitals
- Infection control officer Holy Family Hospital
- Teaching the subject of Pathology with a focus on Microbiology.

- Teaching 3rd and 4th year MBBS and MLT classes: lectures, practical, tutorials and lab rotations.
- Involved with the research and thesis work of the students of 3rd year and 4th year MBBS and MLT Microbiology.

Senior Lecturer **2008-2016**

- Teaching the subject of Pathology with a focus on Microbiology (3rd& 4th year MBBS); lectures, practical, tutorials, lab rotation, exam making and management.
- Teaching 3rd&4th year MLT classes: lectures, practical, tutorials and lab rotations.
- Involved with the research and thesis work of the students of MLT Microbiology.
- Teaching M.Phil. Microbiology students: lectures, tutorials, lab work, research.
- PhD scholar in service.

Senior Demonstrator **2005-2008**

- Teaching Pathology (3rd& 4th Year MBBS): lectures, practical, tutorials, lab rotation, exam making and management.
- Involved in the curriculum designing of problem-based learning (PBL).
- PhD scholar in service.

Demonstrator **1998- 2005**

- Teaching Pathology to the 3rd and 4th year MBBS.
- M.Phil. Trainee.

Demonstrator **1990-1992**

- Demonstrator-Anatomy department.

Benazir Bhutto Hospital-Rawalpindi

Administrator-Microbiology Section **2016-2017**

- Responsible for purchase of supplies & equipment.
- Led lab work associated with National Control Program of Hepatitis, T.B Dot Program, Dengue Control Program

Holy Family Hospital-Rawalpindi

Administrator-Microbiology Section **2005-2016**

- Responsible for purchase of supplies & equipment.
- Led lab work associated with National Control Program of Hepatitis, T.B Dot Program, Dengue Control Program

Medical Officer **1997-1998**

- Performing duties in the Department of Obstetrics and Gynecology

Medical Officer/Registrar **1987-1990**

- Responsible for the Pediatrics ward.

Fauji Foundation Hospital-Rawalpindi

House Officer **1986-1987**

- Medicine and surgery department.

SKILLS

- Microsoft Office (Word, Power Point & Excel), SPSS, Prism Pad.

SYMPOSIA/ CONFERENCES/ WORKSHOPS ATTENDED

- Rawalpindi Medical University 4th International Scientific conference March 2019
- Facilitator preconference workshop (hands on) Standard precautions of infection control March 2019
- Facilitator preconference workshop on sample collection and handling Hazards
- for health care workers March 2019
- Facilitator preconference workshop on Fundamentals of health care waste management March 2019
- workshop on Bio-safety in laboratory medicine March 2019
- Certification of Infection prevention & control in hospitals (IPHC) July 2018
- Facilitator Basics of sterilization and disinfection in IPCH training course July 2018
- Series of guest lectures by international speaker from USA on Quality assurance in laboratory medicine & research ethics and paper writing by
- HEC in RMU 26 June to 5July 2018
- 24 National neurology conference March 2017
- Workshop on infection control awareness RMC March 2017
- 3rd international scientific conference Rawalpindi Medical College March 2017
- 1st Rawalian medical conference AMSA Rawalpindi Medical College Dec 2016
- Symposium on MPNs Rawalpindi Medical College March 2016
- Workshop on designing health services research (basic) April 2014
- Rawalpindi Medical College International Scientific conference Dec 2013
- Introduction to medical education June 2012
- First CME course in hematology October 2008
- Workshop on multiple choice questions May 2007
- Orientation workshop on Medical education April 2007
- Workshop on basics of assessment March 2007
- Workshop on designing and conducting health services research (advanced) February 2007
- Workshop on designing and conducting health services research (basic) January 2006
- Workshop on control of diarrheal diseases June 1988

RESEARCH PROJECTS

- **Prevalence of MRSA positive cases in the dental hospital doctors and staff**
- A collaboration of the Armed Forces institute of Dentistry and Holy Family Hospital Rawalpindi.

- **Clomiphene citrate for induction of ovulation**
- The project was conducted in collaboration with gynecological and radiological department of Polyclinic Hospital Islamabad, Pakistan to assess the hormonal levels in infertile female patients upon induction with clomiphene citrate.

- **Bacterial Vaginosis in married female hospital population**
- The project was conducted in Holy Family hospital on the female patients with complains of vaginal discharge picked up from the OPD-Gynecological department for the determination of bacterial vaginosis, gonococcal and chlamydial infections.

- **Dengue fever serotyping**
- The research work was conducted at the Holy Family Hospital-Rawalpindi, Pakistan during the dengue fever outbreak in 2013, 2014, 2015, 2016 &201**7.**

- **Antibiotic resistance in critical areas of Holy Family Hospital**
- On going research from 2017 till date in all critical areas of the hospital

PUBLICATIONS

- Shireen Rafiq, Nuzhat Nauman, Amna Tariq, Samina Jalali. (2015) Diagnosis of Bacterial Vaginosis in females with vaginal discharge using Amsel's clinical criteria and Nugent scoring in a public sector teaching hospital of Rawalpindi. JRMC; 2015;19(3):230-234

- Nuzhat Nauman, Shireen Rafiq, Samina Jalali, Sajjad Aslam Shami, Nadeem Akhtar. (2016) Consanguinity and Neural tube defects. JRMC 2016; 20(2): 120-123.

- Nuzhat Nauman, Samina Jalali, Sajjad Shami, Shireen Rafiq, Greta Grobe, Alina C Hilger, Rhong Zhang, Saira Mansoor, Michael Ludwig, Heiko Reutter. (2018). Low maternal folate concentration and maternal MTHER C677T polymorphism are associated with an increased risk for neural tube defects in offsprings: a case control study among Pakistani case and control mothers. Asia Pac J Clin Nutr: 27(1):253-260

- Amna Tariq, Shireen Rafiq, Azad Ali Azad, Sophia Khan, Nuzhat Nauman. (2017). Carrier status of Mehicillin-Resistant Staphylococcus aureus(MRSA). JRMC: 21(3):286-289.

- Kiran Fatima, Shireen Rafiq, Kiran Ahmad, (2019) Outbreak of Panresistant Acinetobacter species in intensive care units of Holy Family Hospital Rawalpindi in process JRMC

SUPERVISOR FOR BSC (HONS) MLT REASEARCH PROJECTS IN MICROBIOLOGY

- BSC (Hons) MLT at Rawalpindi Medical University in affiliation with University of Health Sciences

- Frequency of positive blood cultures and their sensitivity pattern in Holy Family Hospital by Ayesha Wasim

- Isolation of Pseudomonas species from the critical units of Holy Family Hospital by Fatima Naveed
- Comparative study of Ziehl-Nelson staining vs flurochrome staining and impact of concentrated technique on diagnosis of tuberculosis in sputum smears by Khushboo Zafar
- Detection of PML-RAR for diagnosis of AML-M3 by Zobia Aslam
- Screening of neonatal wards to detect source of infection in pediatric population of Holy Family Hospital by Zainab Javaid
- Screening of instruments of critical areas of Holy Family Hospital regarding infection control by Irum

Curriculum Vitae

Dr. Muhammad Barkaat Hussain

University Personal No. 00061019
Department of Microbiology, Faculty of Medicine
Rabigh Medical College, King Abdul Aziz University,
Kingdom of Saudi Arabia

Contact Information:

Department of Microbiology, Faculty of Medicine, Rabigh Medical College, King Abdul Aziz University, Kingdom of Saudi Arabia.

Assistant Professor, Department of Microbiology, Faculty of Medicine, Rabigh Medical School, King Abdul Aziz University, Rabigh, Saudi Arabia, 21589

P.O. Box : 80200, Zip Code : 21589
Phone : 00966126400000, Ex: 20079

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E-mail: muhammaduhs67@yahoo.com
mbhussain1@kau.edu.sa

PROFILE

My reseach interests primarily evolve around evaluation and isolation of synergistic antibacterial compound from natural products. I wish to contribute in those infectious diseases where antimicrobial resistance is high and contemporary medicine has limited role. I believe that natural products has tremendous role in overcomming antimicrobial resistance. There is an urgent need to develop novel techiniques whic can identify multiple synergistic antibacterial compounds from natural products. This paricular area is still grossly underestimated and underutilized and it is time for researcher to explore its hidden potential for betterment of ailing humanity. Moreover I am also interested in reformation of medical curriculum according to society and students needs.

EDUCATION

Ph.D Microbiology
University of Health Sciences,
Lahore, Pakistan

Thesis: Screening of Pakistani Honeys For Antibacterial Potential Against *Salmonellae typhi*

2008-2012

M.Phil Microbiology University of Health Sciences, Lahore, Pakistan	**Thesis:***In vitro* Antibacterial Activity of Honey Against Typhoidal Salmonellae	**2006-2008**
MBBS Punjab Medical College, Faisalabad.	Subjects: Medicine, Surgery, Eye, ENT, Gynaecology & Obstetrics	**1987-1992**

POSITIONS HELD

09/10/12- to date **Assistant Professor Microbiology**
Department of Microbiology, Rabigh Medical College,
King Abdul Aziz University, KSA.

10/11/15- to date **Member, Curriculum Review Committee**, Faculty of Medicine.
Rabigh Medical College, Rabigh.

10/11/13- to date **Coordinator**, Immune Blood and Lymph Module, Faculty of Medicine, Department of Microbiology, Rabigh Medical College.

1/3/11 - 10/09/12 **Assistant Professor Microbiology**
Department of Pathology, Gujranwal Medical College, Gujranwala

9/9/10 - 28/2/11 **Demonstrator = Five months**
Department of Physiology, Rawalpindi Medical College, Rawalpindi

2/8/06 - 8/9/10 **Research Scholar = 4yrs and one month**
Department of Microbiology, University of Health Sciences, Lahore

24/7/03 - 1/8/06 **Demonstrator = 3yrs and one month**
Department of Pathology, Rawalpindi Medical College/Holy Family Hospital, Rawalpindi

3/7/96 - 13/2/00 **Scientific Officer = 3 yrs and 7 months**
Department of Immunology, National Institute of Health, Islamabad

14/2/00 - 23/7/03Medical Officer= 3yrs and 5 months
Basic Health Unit (BHU)/Rural Health Centre (RHC), Kotha Kalan/Kotli Sattian, Rawalpindi

6/2/95 - 5/4/96 **Emergency Medical Officer = 1 year**
Qureshi Medical Centre, Khayaban-i- Sir Syed, Rawalpindi

1/7/92 - 1/7/93 House Officer = 1 year
Pakistan institute of Medical Sciences, Islamabad

Academic Experience: Teaching

- Medical Microbiology- Second Year Medical Students (Lectures, PBL, Practical Sessions & Examinations)
- Immunology -fourth Year Medical Students Students (Lectures, Practical Sessions & Examinations)

RESEARCH PUBLICATIONS

1. Jameel T, Baig M, Ahmed I, **Hussain MB,**Alkhamaly MD. Differentiation of beta thalassemia trait from iron deficiency anemia by hematological indices. Pak J Med Sci. 2017;33(3):665-669.

2. **Hussain MB**, Hannan Abdul, Absar Muhammad, Butt Nadeem Shafeeque, *In-vitro* susceptibility of methicillin-resistant *Stayphylococcus aureus* to honey.Complementary Therapies in Clinical Practice 2017 , Volume 27 , 57 - 60

3. Baig, Mukhtiar, Marwan A. Bakarman, Zohair J. Gazzaz, Mohamad N. Khabaz, Tahir J. Ahmed, Imtiaz A. Qureshi, **Muhammad B. Hussain** et al. "Reasons and Motivations for Cigarette Smoking and Barriers against Quitting Among a Sample of Young People in Jeddah, Saudi Arabia." *Asian Pacific journal of cancer prevention: APJCP* 17, no. 7 (2016): 3483.

4. Imran M**, Hussain MB**, BaigM. . A Randomized, Controlled Clinical Trial of Honey Impregnated Dressing for Treating Diabetic Foot**:** *JCPSP*; 2015 25(10):721-725

5. **Hussain MB**, Hannan A, Akhtar N, Fayyaz GD, Imran M, Sidrah S, Qureshi IA. Evaluation of the antibacterial activity of selected Pakistani honeys against multi-drug resistant *Salmonella typhi.BMC Complementary and Alternative Medicine* 2015; 15(1), 32.

6. Qureshi IA, Khabaz MN, BaigM, Begum B, Abdelrehaman AS, &**Hussain MB**. Histopathological findings in goiter: A review of 624 thyroidectomies. *Neuro endocrinology letters* 2015, 36(1).

7. Hannan A, **Barkaat M**. Osman M, Gillani WA, Sameeh W. *In vitro* antibacterial activity of honey against clinical isolate of multi-drug resistant typhoidal salmonellae. Pakistan J of Zool. 2009;41(1):1-6.

8. Hannan A, Saleem S. Chaudhary S. **Barkaat M**. Arshad M U. Antibacterial activity of nigella sativa against clinical isolates of methicillin resistant *Staphylococcus aureus.* J Ayub Med Coll Abbottabad. 2008;20 (3): 72-74.

9. Ahmed D, Waheed A, Chaudhary MA, Khan SR, Hannan A, **Barkaat M** . Nutritional and Antimicrobial Studies on Leaves and Fruit of Carissa opaca Stapf ex Haines. Asian Journal of Chemistry. 2011; 23 (5):2072-6**.**

10. Abdul Hannan, Tabish Humayun, **Muhammad Barkaat Hussain**, Muhammad Yasir, Sumayya Sikandar. I*n vitro* antibacterial activity of onion (allium cepa) against clinical isolates of *vibriocholerae*. J Ayub Med Coll Abottabad. 2010;22(2):160-3.

11. AhmedD**,**Mansha M, Hannan A, **Barkaat M**, Bibi N. Antibacterial activity of *ballota limbata*against potential multidrug resistant human pathogens. Journal of Applied Science Research. 2009;5(10):1611-14.

12. **Hussain MB**. Role of Honey in Topical and Systemic Bacterial Infections. The Journal of Alternative and Complementary Medicine. 2017 Aug 24. ahead of print. https://doi.org/10.1089/acm.2017.0017

13. Munawar, M. S., Raja, S., Waghchoure, E. S., &**Barkat, M.** (2010). Controlling American Foulbrood in honeybees by shook swarm method. *Pakistan J. Agric. Res. Vol*, *23*(1-2).

RESEARCH PAPERS PRESENTED

14. **Barkaat M**. Expression of C3d on the surface of bacteriophage particles. National Conference, Pakistan Association of Pathologist, 12th November 2003, Rawalpindi, Pakistan.

15. **Barkaat M**. Role of Honey as possible therapeutic agent for typhoid fever. Clinico pathological Grand Rounds, 6th September 2007, University of Health Sciences Lahore, Pakistan.

16. Hannan A, **Barkaat M**, Saleem S, Usman M, Gillani WA (Pakistan). Manuka Honey and its Antimicrobial Potential against Multi-drug Resistant Strains of Typhoidal *Salmonellae***.** 7th International Congress on Apitherapy. 26-31 March, 2009, Passau, Germany.

17. Hannan A, Chaudary S, Saba M, Ambreen A, Saleem S, **Barkaat M**, Usman M. Role of microbiology laboratory beyond bacilloscopy; A key component of TB control in mid-resource countries. 2nd Union Conference, Asia Pacific Region 9-12 September 2009. Jinhua SPA & Resort, Beijing, China.

18. Ahsan U, Saleem S, Yasir M, **Barkaat M**. Frequency of Group B Streptococcus carriage in 500 Pregnant Women. 33rd Annual National Conference, Pakistan Association of Pathologists, November, 6-8, 2009. Pakistan Institute of Medical Sciences, Islamabad.

19. Muhammad Yasir, **Muhammad Barkaat**, Rubina Bashir, Usman Arshad. Usman Qamar, Abdul Hannan. Extended spectrum beta lactamase and carbapenemase producing organisms and their susceptibility to manuka and Pakistani honeys. 34th Annual National Conference, Pakistan Association of Pathologists, November, 4-7, 2010. King Edward Medical University, Lahore.

20. **Barkaat M**, Hannan A, Fayyaz GD, Akhtar N. Sceening of Pakistani honeys for antibacterial potential against multi-drug resistant Salmonella typhi. 2ND International Conference on the Medicinal use of honey,Kota Bharu, Malaysia, 13-16 January 2010.

21. **Muhammad Barkaat Hussain**. Screening of honeys for antibacterial potential against multi-drug resistant Salmonella typhi. Research Day, Rabigh Medical College, Rabigh Campus, March, 31, 2013.

22. Imran M, **Hussain MB**, Baig M. A Randomized, Controlled Trial of Honey vs Standard Treatment in the management of Diabetic Foot Ulcers. National Surgical Conference, Pakistan. March, 15-16, 2014.

23. Qureshi IA, Khabaz MN, Baig M, Begum B, Abdelrehman AA, **Hussain MB**.Histopathological Findings in Goiter: A Review of 624 Thyroidectomies. Research Day, Rabigh Medical College, Rabigh Campus, March, 31, 2014.

24. **Muhammad Barkaat Hussain** Susceptibility of diarrhea causing bacterial pathogens to honey. Research Day, Rabigh Medical College, Rabigh Campus, May, 19th, 2015.

25. **Muhammad Barkaat Hussain.** Customizing curriculum according to society and students needs**.** Talent Development Program, King Fahad Research Center, King Abdulaziz University, Jeddah, Saudi Arabia. November 11, 2015.

BOOK PUBLISHED

Muhammad Barkaat Hussain: Honey: A possible therapeutic agent for typhoid fever. Lambert Academic Publishing; 2015.

ACHIEVEMENTS

- **Establishment of "UHS Honey Research Group" in University of Health Sciences, Lahore**

- **Clinical trial; Honey versus conventional modalities for treatment of infected chronic wounds at Department of Plastic Surgey, SIMS Hospital, Lahore, in collaboration with University of Health Sciences, Lahore.**

FUTURE PLAN

- Establishment of Honey Research Unit in King Abdulaziz University, Jeddah
- Development of an antibiotic against multidrug resistant baceria based on synergistic antibacterial compounds derived from honey.
- Customizing medical curriculum according to society and students needs.

MEMBER

International Society for infectious diseases (ISID)
International Society for Infectious Diseases.
9 Babcock Street, 3rd Floor Brookline,
MA 02446 Tel: (617) 277-0551 Fax: (617) 278-9113
Email: info@isid.org
http://www.isid.org/index.shtml

German Apitherapy Society
Weidenbachring 14, 82362 Weilheim-Marnbach, Germany
Tel: 0049-881-92451395 Fax: 0049-881-9095730
E-mail: verwaltung@apitherapie.de
www.apitherapie.de

Society for Medicinal Plant and Natural Product Research
Emmeringerstraße 11 D - 82275 Emmering, Germany
Phone: +49/8141/613749 Fax: +49/8141/613749
E-mail: GA-Secretary@ga-online.org
www.ga-online.org/

FUNDED RESEARCH PROJECTS

- **Co-investigator** in a research project entitled "*Activity of thymoquinone and Nigella sativa against dermatophytes, Aspergillus and Fusarium*" **completed in 2004**. (Funded by King Faisal University, Dammam, Saudi Arabia).
- **Principal Investigator** in a research project entitled "*Study of prevalence of Neisseria gonorrhoeae and Chlamydia trachomatis infection in pregnant women in a teaching hospital*" **completed in 2006** (Funded by King Faisal University, Dammam, Saudi Arabia).
- **Principal Investigator** in a research project entitled "*Determination of relationship of bacterial carriage by hospital staff, hospital acquired infections and antibiotic resistance patterns of bacterial isolates in a tertiary care hospital to develop hospital antibiotic po*licy" **completed in May 2008** (Funded by Department of Human Resource Development, Higher Education Commission, Islamabad, Pakistan).
- **Principal Investigator** in a research project entitled "*Evaluation of status of antibiotic resistance patterns of mycobacteria isolated from patients with pulmonary tuberculosis to develop strategies for effective treatment of tuberculosis*" **completed in May 2013. (**Funded by Department of Research and Development, Higher Education Commission, Islamabad, Pakistan)

PERSONAL PROFILE

of

Dr. Amna Noor

amnanoorpk@yahoo.com

EDUCATION

Degree	University	Year	Specialization
Ph.D	Quaid-i-Azam University, Islamabad	2008	Biochemistry/Molecular Biology
M.Phil	Quaid-i-Azam University, Islamabad	2002	Biological Sciences/Molecular Taxonomy
M.Sc.	Quaid-i-Azam University, Islamabad	1999	Biological Sciences (Research) in Molecular Biology
B.Sc.	University of the Punjab, Lahore	1997	Biochemistry

THESIS TITLE

Ph.D — Gene therapy for the production of bacterial blight resistant plants using *Agrobacterium* mediated transformation.

M.Phil. — Biochemical and Molecular studies of family *Papaveraceae* Linn. of Pakistan.

M.Sc. — Effect of addictive drugs on hormonal level among humans.

Additional: Prevalence of *Tricostryongylus axei* in the sheep of Rawalpindi/Islamabad district.

COMPUTER SKILLS

Competent in MS Word, MS Excel, MS PowerPoint & internet.

EXPERIENCE

Institution	Position Held	Period	Nature of job

		From	To	
Rawalpindi Medical University, Rawalpindi	Senior Technologist (BS-18). Additional Manager Research Operations, ORIC	April.2009-	Till 2020	Teaching MBBS 3rd year and Allied Health Sciences, Management and support the externally and internally sponsored projects. Maintenance of record of the ongoing research proposals and projects of the university.
Al-Shifa Trust Eye Hospital,	Visiting Faculty, Biochemistry	March 2012	Dec 2012	Teaching of Biochemistry, **B.Sc Optometry, L.P.Nursing** course.
Yusra Medical & Dental College, Islamabad	Assistant Professor, Biochemistry (Contractual)	October 21, 2009	January 31, 2010	Teaching of Biochemistry to MBBS 3rd Year
Agricultural Biotechnology Institute, NARC, Islamabad	Doctoral Research Fellow	Sep. 2002	Sep. 2007	Research and Teaching
Agricultural Biotechnology Institute, NARC, Islamabad	Research Student	Sep. 2002	Aug 2003	- Do -
Quaid-i-Azam University, Islamabad	Research Student	March 2000	2002	- Do -

PUBLICATIONS

1. Single nucleotide polymorphisms in asthma candidate genes TBXA2R, ADAM33 FCER1B and ORMDL3 in Pakistani asthmatics a case control study. Nusrat Saba, Osman Yusuf, Sadia Rehman, Saeeda Munir, Amna Noor.2018. Asthma Research and Practice volume 4, Article number: 4

2. Amna Noor, Seemi Gull. Use of antimicrobials among non-medical staff of Rawalpindi Medical College and Allied hospitals. Journal of Rawalpindi Medical College, 2014

3. Hamid Rashid, Amna Noor and Zubeda Chaudhry. Improvement of Rice by *Agrobacterium* mediated genetic transformation" 5th International Plant Tissue Cult. & Biotech. Conf. 4-6 December 2004, Dhaka, Bangladesh. (Abstract)

4. Amna Noor, Hamid Rashid, Muhammad Haroon Khan, Zubeda Chaudhry. Studies on the effect of genotype and explant type on callogenesis and organogenesis in in dica rice. In Pakistan Journal of Botany, *Pak .J. Bot.,* 43(5):2445-2449, 2011.

5. Amna Noor, Seemi Gull. Knowledge, awareness and attitude of medical practitioners about the new biotechnological techniques of recombinant vaccines, submitted in JMRC.

6. Amna Noor**,** Zubeda Chaudhry, Hamid Rashid and Bushra Mirza. Evaluation of resistance of rice varieties against Bacterial blight caused by *Xanthomonas oryzae* pv. *oryzae*. In Pakistan Journal of Botany, *Pak. J. bot.*, 38(1): 193-203, 2006.

7. Amna Noor, Hamid Rashid, Zubeda Chaudhry and Bushra Mirza. High frequency regeneration from scutellum derived calli of basmati rice cv. Basmati 385 and super basmati. In Pakistan Journal of Botany, *Pak. J. bot.*, 37(3): 673-684, 2005.

CONFERENCES/TRAININGS

Oct 2003 Presented a paper in 4th National Conference of Pathology, Pakistan Pathological Society at University of Arid Agriculture, Rawalpindi.

Sep 2005 Attended the National Training Course in "Biochemical/Biotechnological Technique for Disease Resistance" at NWFP Agricultural University Peshawar.

Nov 2005 Participated in 18th FAOBMB Symposium held at University of the Punjab, Lahore

Dec 2005 Presented a paper in 3rd International Symposium on Biochemistry organized by the Institute of Biotechnology and Genetic Engineering, University of Sindh, Jamshoro.

Dec 2005 Attended a Teachers' Training Workshop on Biotechnology & Bioinformatics at Mohammad Ali Jinnah University, Islamabad Campus

Dec. 2008 Attended a conference on Advances in Biochemistry and Molecular

Biology at University of Arid Agriculture, Rawalpindi.

April 2009	Attended a workshop on Research methodologies held at Pakistan Medical Research Council, Islamabad.
April 2009	Attended a workshop on Medical writing held at Pakistan Medical Research Council, Islamabad.
March 21-25, 2017	Presented a paper on the 3rd international scientific conference held in Rawalpindi Medical University.
March 20-22, 2019	Presented a paper on the international scientific conference held in Rawalpindi Medical University.

ADDITIONAL INFORMATION

Name	:	Dr. Amna Noor
e-mail	:	amnanoorpk@yahoo.com
Contact Nos.	:	(Mobile) 0333-5277396
Date of Birth	:	14th August, 1974
NIC #	:	37405-0316322-6
Religion	:	Islam
Marital Status	:	Married
Domicile	:	Punjab
Nationality	:	Pakistani
Postal Address	:	H # B-24, Rawalpindi Medical University Staff Colony, Rawal Road, Rawalpindi.
References	:	If required

Curriculum Vitae of Dr.Asma Nafisa

PERSONAL INFORMATION Asma Nafisa

House No – 25D, Askari - IV,Chaklala Cantt, Rawalpindi (Pakistan)

+92-051-5160683 +92-321-5098043

asmanafisa@gmail.com

Skype asmanafisa

WORK EXPERIENCE

13/04/1995-22/01/2007 **Biochemist**

Department of Health, Government of Pakistan, Lahore (Pakistan)

08/05/2010-TO DATE **Clinical Biochemist**

Benazir Bhutto Hospital, Rawalpindi (Pakistan)

EDUCATION AND TRAINING

01/09/1988-01/09/1990 **BSc - Botany, Zoology and Chemsitry**

Government College for Women, Sarghoda (Pakistan)

01/03/1991-01/03/1992 **BEd - Botany, Zoology and Chemistry**

Government College of Education, Faisalabad (Pakistan)

01/03/1992-03/03/1994 **MSc Bio-Chemsitry**

University of Agriculture, Faisalabad (Pakistan)

MSc Thesis - Bio-Dispostion KINETICS AND URINARY EXCRETION OF KANAMYCIN IN GOATS

01/03/1994-01/06/1997 **MPhil Bio-Chemsitry**

University of Agriculture, Fasialabad (Pakistan)

MPhil Thesis - STUDIES ON MICROBIAL RESISTANCE AND QUALITY ASSURANCE OF SOME COMMONLY USED ANTIBIOTICS

01/10/2014-PRESENT **Phd in Bio-Chemistry**

PIR MEHAR ALI SHAH ARID Agriculture University Rawalpindi, Rawalpindi (Pakistan)

Phd - Thesis : ASSESMENT OF CORTISOL AND LIPOPROTEIN ASSOCIATED PHOPHOLIPASE A2 IN CORONARY HEART DISEASE

MOTHER TONGUE(S) Punjabi

OTHER LANGUAGE(S)

	UNDERSTANDING		SPEAKING		WRITING
	LISTENING	READING	SPOKEN INTERACTION	SPOKEN PRODUCTION	
English	C2	C2	C2	C2	C2

Urdu	C2	C2	C2	C2	C2

Levels: A1 and A2: Basic user - B1 and B2: Independent user - C1 and C2: Proficient user
Common European Framework of Reference for Languages

ADDITIONAL INFORMATION

PUBLICATIONS

1. Microbial Resistance of Staphlococcus Aureus Against Commonly Used Antibiotics. The Sciences 1(#) :97-100 May-Jun 2001.
2. Studies on Biodispostion Kinetics and Urinary Excretion of Kanamycin in Goats.Pakistan Journal of Biological Sciences 3 (7) : 1104-1106, 2002.
3 Disposition Kinetics renal clearance and urinary excretion of kanamycin in goats(VETERINARSKI ARHIN 69 (5)251-260-1999) ISSN 0372-5480 PRINTED in Croatia.

4 Endothelial function dysfunction Impact of Metformin Vol 192, pp 150-162 Pharmacology &Therapeutics, 2018

5 A Mosaic of Risk Factors for Female Infertility in Pakistan Vol 23No.2(2019) April-June JRMC

6 Risk Factors and Outcomes of Neonatal Thrombocytopenia Vol 24No.3(2020) July-Sep JRMC

7 The association between chronic Stress, hair cortisol and coronary heart disease, a case- control study (under review, Stress and Health)

8 Assessment of Hepatic Enzyme Derangements in Covid-19 Patients (under review)

9 Predictive Efficacy of Haematological biomarkers in Covid -19 infection (under review JRMC)

10 Assessment of Lipoprotein-Associated Phospholipase A2 and Conventional Cardiovascular Biomarkers in Pakistani Coronary Heart Disease (Submitted)

TRAINING

Training. Latest Techniques in Biochemistry held at Karachi from 22 to 30 Nov 1999.

Laboratory Train on Gas Chromatography / Mass Spectroscopy, High Performance Liquid Chromatography and Selected Iron Monitoring, Gas liquid Chromatography, Techniques at A.C.R.C., P.C.S.I.R.

1 Ultra Violet Spectrophotometer.

2 Thin Layer Chromatogram (TI, C).

3 Titremetery.

4 Microbial Assays

5 Pyrogen Testing (Both in vivio by using rabbit and invitro by using lal test.

6(Chromogenic) Bio assayusing animals.

7 Steriliy Testing.

Cell Biology and Molecular Biology (School of Pharmacy, University of Queensland Australia)

Tissue culture: Human endothelial cells, human vascular smooth muscle cells

Protein Quantification assays (BCA)

SDS PAGE

PCR

DNA Quantification assays

Use of JuLi stage for live imaging of cell migration

Awards

International research support initiative programme (IRSIP); School of Pharmacy , University of Queensland Australia