



## **TRAINING PROGRAMME IN MEDICAL BIOTECHNOLOGY**

With the intent to carry out research on future health implications of Methyl isocyanate (MIC) in the existing population of the Bhopal Gas Tragedy and other medical ailments, a well equipped Research Department was established in January 2004. The research and clinical faculty have been working in multi-faceted directions with cross disciplinary approach on varied aspects of medical biotechnology including origin and evolution of cancer, molecular regulation of apoptosis, cellular and humoral immune abnormalities and patho-biology of various diseased states.



**Staff of the Department:**

**Director-BMHRC:**

**Professor Dr. Manoj Pandey**

**Faculty:**

**Dr. Puneet Gandhi,  
M.Sc., PGDHHM, Ph.D,  
Professor & Head**

**Dr. Ravindra M. Samartha,  
M.Sc., Ph.D. PDF (NSC-Taiwan),  
Assistant Professor**

**Staff:**

**Dr. Protiti Bose, SRA  
Mrs. Rashmi Barthi, JRA  
Mr. Ram Prakash Punde, JRA  
Mr. Hemant Pandey, JRA  
Ms. Zeba Khan  
Ms. Sangeeta Singh  
Ms. Shweta Mishra  
Mr. Vikram Gurjar  
Mr. Javed Noor (Attendant)**



Our country is viewed as a destination for investment in Biotechnology and the industry is witnessing foreign direct investments in this arena with a parallel growth in National Centers for Excellence. More venture capital companies are also surfacing which really need good, qualified trained manpower with hands-on-experiences in various state-of-the-art cutting edge technologies.

We are going to be the Youngest Nation by the year 2015 and it is predicted that our nation would have one of the largest fleet of biotech graduates in the world. The subject of biotechnology needs huge capital investments for developing infrastructural facilities, the reason why, most of our institutes do not have them and shortage of workforce/expertise in this area is again one of the added-on limitations to the existing one. In developing nations like ours, shortage of resources is one of the limiting factors which hurdle in establishing well furnished state of art laboratory facilities with GMP/GLP compliance to carry forward biotech research. However, outsourcing usage of existing facilities may substantially reduce this burden on the state.

To achieve these larger goals, we at BMHRC, as a societal responsibility are expanding the flow of benefits to the student community of the state by coordinating and outsourcing our established state of art facilities and technical expertise.

### **Molecular Immunology and Cell Signaling:**

- Double sandwich ELISA.
- Analysis for TH1/ TH2 paradigm by CBA.
- Separation of amino acid mixture by TLC.
- Direct and indirect immunofluorescence.
- DNA cell cycle analysis by flow cytometer.
- Apoptosis assays by flow cytometer.
- Fractionation by ultracentrifugation.
- Lyophilization
- Immunophenotyping
- Redox signaling assays
- DNA damage Assays
- Cancer cell and Embryonic signaling assays
- Interleukins & proteomic markers -IFN $\gamma$ , IL6, IL10, Neopterin, serum Cu/Zn, 8-oxo-DG, serum erythropoietin, N-GAL, Cryoglobulin detection & estimation.



### **Animal Tissue Culture Techniques:**

Introduction to tissue culture.  
Secondary cell culture and maintenance.  
Cryopreservation.  
Single cell cloning.  
Angiogenesis assays.  
Nano-drug delivery assays.  
Initiation of primary culture.

### **Molecular Cytogenetics:**

Epi-fluorescence microscopy  
Spectral karyotyping (SKY).  
Peripheral blood lymphocyte culture  
Karyotyping and G-banding.  
Fluorescence *in-situ* hybridization (FISH).  
Immunocyto chemistry for proteomic markers.

### **Proteomics and Genomics:**

Cell lysis and protein extraction.  
Isolation and estimation of DNA.  
Isolation and estimation of RNA.  
Isolation and estimation of Proteins.  
1-D vertical slab SDS-PAGE.  
Western blot.  
Horizontal electrophoresis–agarose gel electrophoresis.  
Inter simple sequence repeat PCR.  
Reverse transcriptase PCR.  
Software based analysis of 1-D PAGE and western blots.



**Molecular Diagnostics:**

Multiplex Real Time PCR for:

Hepatitis B Virus DNA (HBV)

Hepatitis C Virus RNA (HCV)

Hepatitis A.B.C. (Hepa trio)

Human Immunodeficiency Virus DNA (HIV)

Mycobacterium Tuberculosis DNA (MTB)

Sexually transmitted infections.(STI)

Sepsis – bacterial and fungal.



**INSTRUMENTATION AVAILABLE IN DEPARTMENT**

S. No.	NAME OF INSTRUMENT	NAME OF THE COMPANY
1	MULTIPLEX PCR	BIORAD, CFX96
2 (A)	REAL TIME PCR (standby machine)	ROCHE AS & MD, GERMANY
2 (B)	REAL TIME PCR	QIAGEN, GERMANY
3	CALIBRATED DENSITOMETER GS-800	BIORAD, USA
4	FLOW CYTOMETER & CELL SORTER (FACS)	BECTON & DICKIN SONS, USA
5	2-DIMENSIONAL, ELECTROPHORESIS (IEF)	SCIE-PLUS, UK
6	SPECTRAL KARYOTYPING SYSTEM	APPLIED SPECTRAL IMAGING, ISRAEL
7	TRINOCULAR RESEARCH MICROSCOPE FOR CYTOGENETIC WORKSTATION	CARL ZEISS, NEW DELHI
8	INVERTED PHASE CONTRAST & FL. MICROSCOPE	NIKON, JAPAN
9	SOXHLET EXTRACTION APPARATUS	SCIENTECH
10	INVERTED MICROSCOPE	OLYMPUS
11	ELISA READER	TRIVITRON, USA
12	ELISA READER	BIORAD,
13	SPECTROPHOTOMETER	BIORAD, USA
14	LYPHILIZER	MARTIN CHRIST, GERMANY
15	ULTRACENTRIFUGE	SORVAL HERAEUS, GERMANY
16	CONVENTIONAL PCR	MJ RESEARCH, USA
17	GEL DOCUMENTATION UNIT	VILBER LOURMAT, FRANCE
18	BACTO HOOD SAFETY CABINET	TELSTAR, KENDRO LAB PRODUCTS, NEW DELHI
19	P-2 SAFETY CABINET	HAIER, HONGKONG
20	BACTOHOOD (LAMINAR MINI-VPCR)	TELSTAR, GERMANY
21	P-2 SAFETY CABINET	HERAEUS, GERMANY
22	FUME HOOD FOR RADIOACTIVE ISOTOPE HANDLING	S.M. SCIENTIFIC INSTRUMENT, IND.
23	DNA ELECTROPHORESIS SYSTEM	GE HEALTH CARE, UK
24	GEL- DRYER UNIT	GE HEALTH CARE, UK
25	DEIONIZED WATER SYATEM	MILLIPORE, USA
26	PROTEIN ELECTROPHORESIS SYSTEM	GE HEALTH CARE, UK
27	MINI ELECTROPHORESIS SYSTEM	BIO-ROD, USA
28	HYBRIDIZATION OVEN	GE HEALTH CARE, UK
29	SEMI-DRY TRANSFER UNIT	GE HEALTH CARE
30	SLOT BLOT APPARATUS	GE HEALTH CARE
31	SPEED VAC	MARTIN CHRIST, GERMANY
32	TRANSILLUMINATOR	HOEFER
33	THERMOSTATIC CIRCULATOR	VACCUGENE
34	ANALYTICAL BALANCE	DENVER
35	MICROCENTRIFUGE	EPPENDORF, GERMANY
36	ULTRA-CENTRIFUGE	SORVALL Avanti-j25 BECKMAN COULTER, USA
37	DOSIMETER	DOSIMETER CORPORATION



**APPLICATION FOR POST GRADUATE DISSERTATION/ SUMMER/ SHORT TERM  
TRAINING/ CERTIFICATE COURSE**

Name:

Age/Sex:

Language Know (Reading):

(Writing):

Academic Qualification (attach photocopies of mark sheets):

Recent  
Passport Size  
Photo

S. No.	Name of Examinations	Board/University	Year	% / Grade
01	HIGH SCHOOL CERTIFICATE			
02	HIGHER SECONDARY			
03	UNDER-GRADUATE			
04	POST-GRADUATE (specify specialization)			

Details of Academic Trainings & Workshops:

Current Institutional

Address: Address for

Correspondence:

E-mail:

Contact No.:

Signature of the Candidate:

**Official Endorsement from HOD/Principal**

**Application Form along with supporting documents & clearly stating programme applied for should be sent by Post to:**

Academic Cell, Administration Block  
Bhopal Memorial Hospital & Research Centre  
Raisen Bypass Road, Bhopal - 462 038 (MP)

Tel.: 0755- 2742212/13/14/15/16/17, Fax No: 0755-2748309, [email: academiccellbmhrc@gmail.com](mailto:academiccellbmhrc@gmail.com)



## Training Programme in Medical Biotechnology

S.No	Course	Period of Training	Training fee for Students ( in Rs.)	Training fee for Faculty( in Rs.)
1.	Ph.D.	3-4 Years	25,000 /-Admission Fee + 2,000/- p.m	30,000 /-Admission Fee + 2,400/- p.m
2.	M.Sc. Dissertation	6 months	18,000/	-----
3.	Project Training –MSc. ,B .Tech., M.Tech	6 months and onwards	3,000/- p.m.	5,000/-p.m
4.	Summer Internship Training Programme (batch wise- min. 10 students)	30 days	10,000	Rs. 15,000/-
5.	Hands-on practical skill upgradation- PG M.P. Biotech council sponsored	15 days	Rs. 9,000/-	Rs.10,000/-
6.	Specialization Certificate courses	6 months	Rs. 18,000/-	Rs. 25,000/-
7.	Short term/ Instrumentation training (batch wise- min. 10 students)	6/ 12 days	Rs.3000/- / Rs.6000/-	-----

\* Hostel fees (lodging and boarding charges) not included.

\*\* Fees to be submitted through Demand Draft only, drawn in favor of Director, BMHRC payable at Bhopal, 15 days prior to commencement of programme. Training fees is non-refundable.

### Terms & Conditions

- Candidates with NET/GATE/ICMR/DBT qualification/independent fellowship only are admitted for Ph.D.
- The topic of Dissertation is allotted by the Department of Research, BMHRC, pertaining to the various arenas of Medical Biotechnology.
- During the training, candidates have to work on every working day of the stipulated period (1000-1700 hrs), 6 days a week. Scholars and students are permitted to use canteen and library facilities of the Institute.
- In case interested, candidates are permitted to avail in-house accommodation (hostel) facilities as per existing norms, with 15 days prior intimation.
- BMHRC possesses the option of termination of the academic programme, if the candidate is found lacking in commitment /conduct or incorrect information is supplied in application form.
- No stipend is provided for candidates accepted for dissertation/internship/summer training.
- E-mail id is mandatory for further correspondence/intimation of acceptance.
- Only 5 days of leave will be sanctioned for competitive exams during the tenure of any regular training.
- Eligibility for certificate course is- minimum final year post graduate.
- Lab visit (advanced instrumentation) for 1 day,( Rs. 50/- per student). One faculty can accompany 10 students for a lab visit.