



THE GUJARAT CANCER & RESEARCH INSTITUTE

Cancer Biology Finishing School

Skill Enhancement in
Molecular Biology Techniques

Starting from June 2019
(Four Months Course)

Supported by
Department of Science and Technology,
Government of Gujarat,
through
Gujarat State Biotechnology Mission
under
Gujarat Biotechnology Policy, 2016-21



Message

Twenty-first century being a century of upgraded and innovative technologies essential for combating the life threatening diseases, necessitates young professionals with frontline training, immense knowledge and practical experience. It is my great pleasure to introduce the new course, The Cancer Biology Finishing School at The Gujarat Cancer & Research Institute (GCRI) supported by Department of Science and Technology, Government of Gujarat, through Gujarat State Biotechnology Mission (GSBTM). The Cancer Biology Finishing School will be an effective move to cater today's demand of high skilled Molecular Biology Professionals in the field of Oncology diagnosis and treatment.

I heartily congratulate Cancer Biology Department for their immense interest, big initiative and dedicated efforts (as ever) to start Cancer Biology Finishing School which is need of the day.

I would encourage the students attending the Cancer Biology Finishing School to utilize this platform maximally to become Skill Experts in Molecular Biology Techniques in their future endeavors.

Good luck and best wishes for the success of the course.

A handwritten signature in blue ink, appearing to read 'Shashank J Pandya', with a long horizontal stroke extending to the right.

Dr. Shashank J Pandya

Director

The Gujarat Cancer & Research Institute

Course Director

Dr. Shashank J Pandya
Director

Course Advisors

Dr. Prabhudas S Patel
Professor and Head
Cancer Biology Department

Dr. Hemangini H Vora
Associate Professor and Head
Immunohematology Lab

Course Coordinators

Dr. Nandita Ghosh, Assistant Professor and Head, Tumor Biology Lab
Dr. Trupti Trivedi, Senior Scientific Officer and Head, Clinical Carcinogenesis Lab
Dr. Jayendra Patel, Senior Scientific Officer and Head, Molecular Oncology Lab
Dr. Franky Shah, Senior Scientific Officer and Head, Stem Cell Biology Lab
Dr. Pina Trivedi, Senior Scientific Officer and Head, Cytogenetic Lab

Faculty Members

Dr. Kruti Rajvik, Junior Scientific Officer
Dr. Toral Kobawala, Research Assistant
Dr. Nupur Patel, Research Assistant
Dr. Birva Brambhatt, Research Assistant
Dr. Jigna Dave, Junior Research Assistant
Dr. Apexa Raval, Research Assistant
Dr. Kinjal Gajjar, Research Assistant
Dr. Dharmesh Patel, Research Assistant
Dr. Kinjal A Patel, Junior Research Assistant
Dr. Shruti Patel, Junior Research Assistant

Members

Dr. Kinjal D Patel
Ms Darshita Patel
Ms Kruti Mehta
Mr Hitarth Patel
Ms Priya Varma
Ms Khushbu Rajan
Ms Mittal Mistry
Ms Nirali Shukla
Ms Nikita Bhatt
Ms Grusha Joshi
Ms Disha Jethva
Dr. Mansi Desai
Ms Mahnaz Kazi
Ms Vinal Upadhyay
Ms Nehal Patel
Ms Dhara Ladani
Ms Bhoomi Tarapara
Ms Zeal Rawal
Ms Bansi Ladani
Ms Ashi Thobias
Ms Priyanka Mistry
Ms Hiral Mandaliya
Dr. Nutan Badgujar

The Gujarat Cancer & Research Institute (GCRI) and Cancer Biology Department

The **Gujarat Cancer & Research Institute (GCRI)** is a regional cancer centre of Government of India, established in 1972 from M.P. Shah Cancer Hospital founded in 1964. Since then GCRI has bloomed and at present it is 650 bedded comprehensive cancer centre with world class cancer care facility and a competent team of clinicians and scientists to take pride of. The Institute is affiliated to the BJ Medical College and Gujarat University, Ahmedabad, for super specialty teaching in the subjects of Medical and Surgical Oncology (DM and MCh courses) as well as postgraduate teaching in subjects like Pathology, Radio diagnosis, Gynecological Oncology, Anaesthesiology and Radiotherapy (MD, DCP, DMRE, DA courses). It is also affiliated to Gujarat University (Life Sciences and Medical Microbiology) and M.S. University (Biochemistry) for PhD degree courses. It has international collaborations with Germany, France, USA and UK for clinical translational research and education, and is a nodal centre of Gujarat State for Bioinformatics.

Since its inception of the Institute, the word “**Research**” is interwoven in the name of the Institute (GCRI) indicating the eminence of Research and Education in the foundation of the Institute. The **Cancer Biology Department** (Research Wing) was established in 1980 with three research laboratories. Today, it has flourished into **six well equipped** world class research laboratories, each having competent and enthusiastic team working on state-of-the-art research activities through various cancer research projects. The area of interest are particularly in the field of molecular epidemiology, cytogenetic, genomics, proteomics, epigenomics, stem cell research, bioinformatics, medicinal and pharmacogenomics. The Department has earned national and international fame through its more than 300 research projects, more than 400 research papers published in peer reviewed national and international journals and honors / awards achieved at national and international forums.

Apart from research, the Department is also indulged in academics and offers Gujarat University affiliated **M. Sc. in Cancer Biology** course, started during the year 2013 first time in India. This course is designed for students who wish to acquire advanced education and training in biological sciences, pertaining to a disease which remains a major that global concern. The Department is also involved in educational activities which include dissertations to post graduate students of M. Sc., M. Pharm. and M. Phil. (both within and outside Gujarat), observership to postgraduate students from science and allied science and permitting Ph.D. students of many universities to perform their partial Ph. D. work. Furthermore, every year, under graduates and post graduate students undergo short-training programme.

Facility and Instrumentation

Department has all modern infrastructural facilities for Teaching and Research in Molecular Biology including seminar hall, classroom and audio visual teaching aids useful in effective teaching. GCRI library is well equipped with audio-visual aids and separate air-conditioned computer lab with broadband internet facility. Faculties, residents, researchers, postgraduate students, fellows and paramedical staffs can access online journals and books which are subscribed by the library. It has user-friendly open access system.

The Department is well equipped with Real-Time PCR Machines, Thermal Cyclers, UV-Vis Spectrophotometers (Single Beam And Double Beam), Gel Documentation Systems, Electrophoresis Units (Vertical And Horizontal) With Blotting Unit And 2D Electrophoresis Set Up, HPLC, Imaging System for Karyotyping, FISH set up, Elisa Plate Reader, Flow Cytometer, Ventana Benchmark Auto Immunostainer for Immunohistochemistry, Deep Freezers (-200c and -800c), Biosafety Cabinets, Cell Culture Facility, Phase Contrast Microscopes, CO2 Incubator, etc.

The department has procured newer Biotech facilities such as Modular Cell/Tissue Culture Facilities, Microarray Facility, Multimode Microplate Reader, Automated Cell Sorter/Cell Separator, Geldoc with Chemiluminescence, Upright Fluorescence Microscope with Camera, Automated Image Acquisition, Upright Fluorescence Research Microscope with computer etc. In a short duration the facility of DNA Sequencer (Next Generation Sequencing) will be available at Cancer Biology Department.

Cancer Biology Finishing School

Cancer Biology Finishing School Programme is a 4 months (16 weeks) FULL TIME, **CERTIFICATION COURSE** run by Cancer Biology Department at The Gujarat Cancer & Research Institute, Ahmedabad, Gujarat, supported by Department of Science and Technology, Government of Gujarat, through Gujarat State Biotechnology Mission (GSBTM) under Gujarat Biotechnology Policy, 2016-21.

The opportunities in the fields of molecular biology and the potential to use this information in diagnostic procedures are escalating. With this in mind, the aim of Cancer Biology Finishing School Programme is to provide fundamental knowledge and training of molecular biology tools and its scientific concepts relevant to cancer biology.

The objective is to equip the aspiring students enrolled in Cancer Biology Finishing School Programme with all above-mentioned biotechnology facilities. The students enrolled in Finishing School Programme will be taught through lectures related to basic and advanced Genomics, Proteomics and

Cancer Biology Finishing School

Cytogenetic technologies. The medium of teaching will be English. Internal assessment of the students will be done by faculty members. The practical conducted during the course will be pertaining to recent molecular based biotechnologies useful in oncology. **Relevant hands on practical training will comprise of DNA and RNA extraction from various biological fluids, quantification using various methods, qRTPCR, ddPCR, Immunohistochemistry, Flowcytometry, Microarray, Next generation sequencing (NGS), FISH, etc.** They will also be actively involved in seminars, assignments, industrial/ research centre visit, personal interaction of students with eminent scientists, etc. Apart from teaching they will gain knowledge on fundamentals of Bioinformatics and Biostatistics, special emphasis will remain to nurture the students in the field of oncology, clinical research and cancer research.

Eligibility for Cancer Biology Finishing School

Minimum 50% in following disciplines:

- MSc Biological Sciences (Life Science, Biotechnology, Microbiology, Biochemistry, Zoology, etc.) from recognized UGC University
- BSc/MSc with MLT from recognized institute
- Candidates who have pursued MBBS, MD, BDS, MDS, B.Pharm/M.Pharm

Intake Capacity and Admission Criteria for Cancer Biology Finishing School

Twice a year, 20 students will be admitted per batch

Announcement of admission of the course will appear in website of GCRI (www.gcriindia.org). Admission will be given based on the merit list with weightage of personal interview.

Application form is available on GCRI website (www.gcriindia.org) and from the HR department of the Institute.

Fee Structure for Cancer Biology Finishing School

Science/Pharmacy students: Rs. 10,000/-

Medical/Dental students: Rs. 25,000/-

Fees once paid shall not be refunded under any circumstances.

Certificate will be issued to the candidates only after successful completion of the course

Syllabus

Lectures Details (Cancer Biology Finishing School) SKILL ENHANCEMENT – Molecular Biology Techniques

Unit I: Basic Genomics Technologies

Genetic Basis of Cancer; Hereditary and Sporadic Cancers; Identification of Mutations In Tumor Suppressor Genes and Oncogenes by Conventional PCR Techniques: SSCP, RFLP, PCR, Real Time RT-PCR, Epigenetic Alterations by Methylation Specific PCR.

Unit II: Advanced Genomics Technologies

Liquid biopsy in Clinical Diagnosis; Principle, Procedure and Application of Microarray; CGH Array, Transcriptome Profiling; Principle, Procedure and Application of Next Generation Sequencing; Targeted Genome Sequencing; Principle, Procedure and Application of Droplet Digital PCR; Identification of Disease Associated Gene Signature.

Unit III: Molecular Cytogenetics

Introduction to Microscopy and Cytogenetics; Numerical Abnormalities; Structural Chromosome Abnormalities; X Chromosome Inactivation; Banding Techniques; G-Banding; Karyotype Analysis and Nomenclature; Molecular Cytogenetics Methods; FISH, Cytogenetics of Leukemias; Cytogenetics of Solid Tumors.

Unit IV: Proteomics Techniques

Introduction to Protein Identification; Principle, Procedure and Applications of Immunoassays, Immunohistochemistry, Flow Cytometry, Western Blotting; Two Dimensional Gel Electrophoresis; HPLC; Protein Microarray; FAC based Cell Sorting and its Applications; Identification of New Cancer Biomarkers for Personalized Medicine of Cancer.

Practical Details

Unit-I

1. Isolation of DNA from biological samples.
2. Isolation of RNA from biological samples.
3. Isolation of cell free DNA from biological samples.
4. Analysis of mutation using PCR-SSP methods.
5. Analysis of mutation using PCR-RFLP methods.
6. mRNA expression study by RT-PCR and qRT-PCR methods.

Unit-II

7. Gene amplification using droplet digital PCR.
8. Expression profiling using microarray technique.
9. Gene sequencing using next generation sequencer.

Unit-III

10. Chromosome analysis from peripheral blood lymphocytes by Giemsa Trypsin
11. FISH assay to study gene amplification in solid tumor malignancies.
12. Study of genetic rearrangements in hematological malignancies.

Unit-IV

13. Protein quantification by ELISA, Western blot and Immunohistochemistry.
14. Determination of surface and intracellular antigens from whole blood by Multicolor Flowcytometry and sorting of cells.
15. Flowcytometric evaluation of stem cells in bone marrow transplant samples
16. Quantification of unknown component by HPLC.
17. Protein separation using different electrophoresis methods [agarose gel electrophoresis, PAGE (Native and SDS) and 2D electrophoresis].



FISH Facility



HPLC



Spectrophotometer



Flow Cytometer



2D Electrophoresis



Droplet Digital PCR



Laminar Flow



Automated Immunohistochemistry

World Class Laboratory Set-up



Cytogenetics



**Automated
Karyotyping**



**Liquid Nitrogen
Storage**



Multimode Reader



Gel Documentation



Microarray



Real Time PCR



BOD Incubator



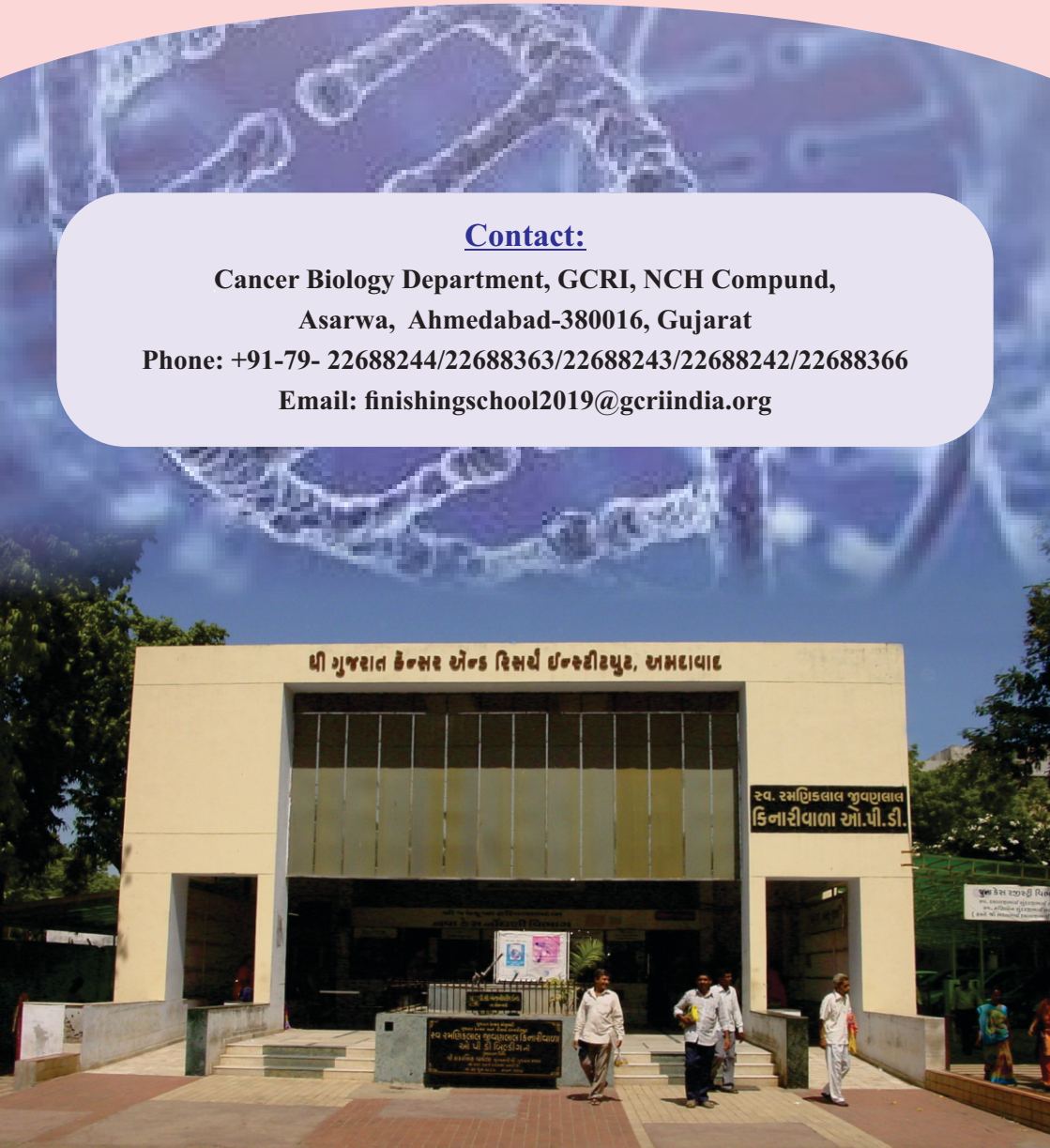
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THE GUJARAT CANCER & RESEARCH INSTITUTE

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Asarwa, Ahmedabad-380016, Gujarat
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ADMISSION ANNOUNCEMENT

Cancer Biology Finishing School

(Skill Enhancement in Molecular Biology Techniques)

Full Time Certificate Course; Duration: 16 weeks



Applications are invited for admissions in GSBTM sponsored Cancer Biology Finishing School at The Gujarat Cancer & Research Institute (GCRI) with special emphasis on Molecular Biology Techniques.

Aim

To provide fundamental knowledge and training of molecular biology tools and its scientific concepts relevant to cancer biology.

Course Content

- Lectures related to basic and advanced Genomics, Proteomics and Cytogenetic technologies
- Relevant hands on practical training on basic and advanced molecular techniques including qRT PCR, ddPCR, Immunohistochemistry, Flowcytometry, Microarray, Next generation sequencing (NGS), FISH, etc.
- Personal interaction of students with eminent scientists
- Seminar presentations & report preparation
- Industrial visits

Objectives

- To equip the aspiring participants with basic and advanced concepts of molecular biology techniques in cancer biology.
- To enrich the participants as trained expert, employable in the field of oncology.

Eligibility Criteria

- Minimum 50% in M.Sc. in Biological Sciences (Life Science, Biotechnology, Microbiology, Biochemistry, Zoology, etc.) from recognized UGC University
- Minimum 50% in M.Sc. with MLT from recognized institute
- Minimum 50% in B.Sc. with MLT from recognized institute
- Candidates who have pursued MBBS, MD, BDS, MDS, B.Pharm/M.Pharm

Course Fee Structure

Science/Pharmacy students: Rs.10,000/-

Medical/Dental students: Rs.25,000/-

Seats and Enrollment Criteria: 20 Students, on Merit and interview basis

Deadline for application: May 30, 2019

Application form is available on our website (www.gcriindia.org) and from the Institute.

Course Director

Dr. Shashank J Pandya
Director

Course Advisors

Dr. Prabhudas S Patel
Professor & Head, Cancer Biology Department

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Associate Professor & Head, Immunohematology Lab

Co-ordinators

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Dr. Franky Shah, In-charge, Stem Cell Biology Lab

Contact:

Cancer Biology Department, GCRI, NCH Compound,
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THE GUJARAT CANCER & RESEARCH INSTITUTE

(Cancer Biology Department)

Cancer Biology Finishing School

APPLICATION FORM

Application No.					
Personal Details					
Surname	First Name	Middle Name	Age (yrs)	Gender	Native
Current Residential Address	Permanent Residential Address				
Contact Number	Mobile :	Landline:			
Email address					
Academic Details					
Degree	University/Institute	Place	Year of Passing	Marks obtained	Subject
Terms and conditions:					
Rs. ----- will be fees towards training and has to be paid within 7days from selection for training.					
Fees can be paid by cash/cheque/DD/NEFT or online transfer.					
Cheque or DD should be in favor of The Gujarat Cancer and Research Institute payable at Ahmedabad .					
<i>If fees to be paid by NEFT or online transfer our bank details are as below:</i>					
Account name:					
Bank Name: Central Bank Of India, Chamanpura Branch, New Civil Hospital Compound, Asarwa, Ahmedabad-380016, Gujarat.					
Branch: Chamanpura Branch					
Account Number: 1056834274					
IFSC Code: CBIN0282047					
MICR Code: 380016006					
<ul style="list-style-type: none">• Selection for training will be confirmed after personal interview• Total training will be of 16 weeks. 14 weeks training session and rest 2 weeks will be internship/Industrial training• Training certificate will be issued to only successful students undergone for test and evaluation after completion of training course					
Declaration:					
<ul style="list-style-type: none">• I confirm that the information given on this form is true, complete and accurate and no information requested or other significant information has been omitted.• I have read the Notes for Guidance for Completion of the Application Form.• I agree to above terms and conditions if I am selected for the training.					
Applicant's Signature: Date:					