Biotechnology Skill Development Program in Molecular Diagnostics and Next Generation Sequencing

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RGCB: Pushing the Frontiers of Knowledge

India's engagement with biotechnology, life sciences and medicine is dynamic and constantly evolving. The Rajiv Gandhi Centre for Biotechnology (RGCB) sees itself a key player in this development process. Our research is focused on understanding disease biology and processing this knowledge for better management and therapeutics. The trademark feature of RGCB is the collaborative and interdisciplinary approach we bring to everything we do. This unique facet and the energetic atmosphere of the institute is our success, also creating by itself an ideal and fertile teaching atmosphere for graduate students and postdoctoral trainees. Over the past 10 years, the ability of RGCB in making major contributions to understanding the fundamental mechanisms of disease has been greatly improved by support for our core facilities and research by the Department of Biotechnology, Government of India. We are also unique among other research institutions in the country, working out of three campuses, one concentrating on discovery, the second, an innovation focused research facility and the third a Bio-Nest for translation of research into applications and products.

Many colleges do their best to teach students theoretical aspects of Biotechnology, and often do this with high success rates. Unfortunately such teaching institutions are not in position to procure, maintain and conduct experiments with state of the art biomedical devices and instruments which are expensive to procure, costly to maintain and not financially viable to run experiments for a large group of students. There are also major limitations such as lack of ongoing research activities, lack of funds, privately run institutes not willing to spend or a combination of all of these. This has led to an unfortunate situation where research institutions and industry get incompletely trained personnel. Ultimately therefore, large parts of the human resource effort in industry and research time in top institutes are spent for hands-on training of new recruits or research scholars.

To address this burning issue and circumvent the problem, RGCB has embarked upon an ambitious BIOTECHNOLOGY SKILLS DEVELOPMENT PROGRAM, where fresh graduates are provided with extensive hands on training on the most widely used state-of-the art research equipments. RGCB Scientists and Technical Officers will provide both theoretical and practical knowledge to graduates and post graduates enrolling in the Skill Development Program. Thus this Skill Development Program is designed to generate a large pool of skilled labour, with a

major objective to fulfill the national mandate of generating high-quality skilled and directly employable work force in various niche areas of biotechnology, molecular diagnostics and Next Generation Sequencing.

Advances in molecular and cell biology have provided an understanding of the mechanisms of disease at molecular and genetic levels. This understanding can now be translated into diagnostic, prognostic, and therapeutic applications in modern medicine. Abnormal molecules not only provide a signature for the presence of a disease, but may also provide the clues for design of drugs targeting the specific abnormal function.

Course end points and skills acquired

- Defines basic terminology and describes concepts in molecular diagnostics that provide the foundation for implementing and adapting new techniques and assays.
- Summarizes nucleic acid chemistry: replication, transcription, and translation.
- Explains principles of nucleic acid isolation from blood and solid tissues.
- Extracts, purifies, quantifies and stores DNA and RNA for analysis
- Explains principles of polymerase chain reaction (PCR), reverse transcriptase PCR, and other amplification techniques and performs such assays.
- Explains principles of nucleic acid electrophoresis and hybridization including Southern and Northern blots and performs such assays.
- Interprets results in context of other laboratory and clinical data.
- Monitors disease progress and therapeutic efficacy with molecular diagnostic techniques.
- Evaluates commercial kits and systems for molecular diagnosis both in automated and manual process.
- Compares and selects appropriate molecular diagnostic methods.
- Records and communicates molecular diagnostic results in a professional manner.
- Discusses ethical considerations of molecular test results such as patient data privacy and discrimination.
- Understands Quality Assurance procedures and quality audit.
- Comprehends good laboratory practice and good manufacturing practice.
- Hands on training on next generation sequencing (NGS).
- Exposure to applications based on NGS.
- Familiarize with the use of NGS in health care both in human and microbial genetics.
- Acquaint sequence data analysis by different pipelines and its interpretation using software-based algorithms.

ADMISSION PROCEDURE

- Application Form Candidates are required to take print out of the duly filled application form from RGCB Webpage (http://rgcb.res.in), paste a recent passport size photograph, complete and sign the form.
- Incomplete applications are liable to be rejected.
- Selection will be based on first come first placement mode.
- 20 candidates will be admitted every 6 months for the program.
- A course completion certificate will be issued on successful completion of the tenure and final assessment aggregate grades will be included in the certificate.

Eligibility

First Class B.Tech or M.Tech in Biotechnology, MBBS or BVSc, M.Sc (Biotechnology or Life Science) or MD or MVSc from any recognized University.

Course Duration: 6 months accelerated program
No. of Seats: 20
Age Limit: 30 years
Fees: Rs. 60,000/- (Rupees Sixty Thousand), payable in full at the time of admission