Post Graduate Diploma

in

Molecular Diagnostics
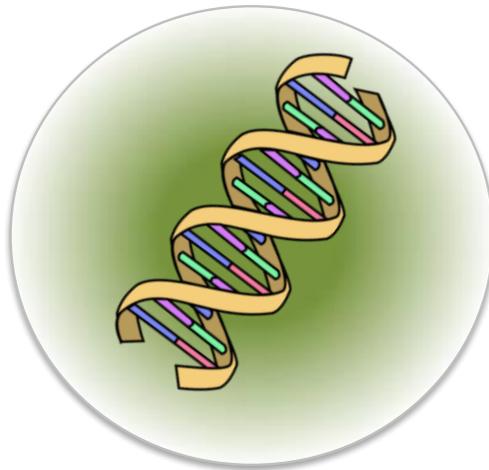
MCARS

MultidisciplinaryCentre for Advanced Researchand Studies

JamiaMilliaIslamia – Maulana Ali Jauhar Marg, New Delhi-110025

I. Objectives of introducing the new course:

Molecular biology has revolutionized the healthcare system by providing rapid and timely diagnosis to ease the treatment modalities. The high-demand for molecular diagnosis is primarily driven by an increase in incidence of life threatening diseases, like cancer, infectious diseases, diabetes and neurological disorders. Hospitals, industries and research centres account for the largest share in this market. Recent report by "The Hindu Business line March 07, 2018" indicates that India by 2030 will require 2 million doctors and 6 million nurses. In another survey by Boston Consulting Group and Confederation of Indian Industry (CII) has predicted that by 2020, Indian healthcare sector alone will generate approximately 40 million jobs. This means an immediate need of trained professionals in healthcare sector including the molecular diagnostics. Though the molecular diagnostic technologies in India are at par with the global standards, we still lack in providing skilled professionals who can make efficient use of the available resources and technology. Therefore, to meet the demand, for skilled professionals in the field of molecular diagnostics, we plan to introduce a new one-year research based PG diploma course on Molecular Diagnostics at our centre of Multidisciplinary Centre for Advanced Research and Studies (MCARS). This course will be primarily taught by the faculty members of MCARS, who have the expertise in the range of subjects (genomics, proteomics, microbiology, virology, parasitology, computational biology, data analysis and statistics).   Additionally, our well-equipped laboratory facilities at MCARS shall provide a platform for successfully running the hands on session of the course. We plan to maintain maximum annual intake capacity of thirty undergraduates so as to maintain an appropriate teacher-student ratio. We believe that this would provide quality hand holding so that our students are well placed in sectors such as hospitals, diagnostic labs, pharma industries and R&D labs.

I.1. Learning Objectives:

Successful completion of the research based Molecular Diagnostic PG Diploma Course will ensure that students acquire:

   a. The basics and principle of applications of various molecular diagnostic methods
   b. Selection of an appropriate diagnostic method/tool for a particular disease condition and sample type
   c. Adequate knowledge about recent advances and technological developments in the field of diagnostics
   d. Practical knowledge of various diagnostic tools used in healthcare, industry and research
   e. Expertise to perform any diagnostic test with an ability toin troubleshoot

I.2.   Eligibility:

The minimal eligibility for the students to enroll in the PG diploma course is to have an undergradutae degree in science (B.Sc) in either of the following subjctes; (a) Zoology, (b) Chemistry, (c) Biochemistry, (d) Life-Science/Bioscience, (Microbiology) or (e) Biotechnology with minimal 55% marks or equivalent grades.

I.3.   Technology involved in Advance Molecular Diagnostics:

Molecular diagnostic techniques involve detection of DNA, RNA, Proteins and pathogens from various biological samples. The commonly used techniques are:

1. Polymerase chain reaction (PCR)
2. Recombinant DNA technology
3. Enzyme-linked immunosorbent assay (ELISA)
4. Chromosomal techniques
5. DNA and RNA sequencing
6. In situ hybridisation
7. Microarray analysis
8. Western blot analysis
9. Immunohistochemistry
10. Protein mass spectroscopy
11. Imaging based diagnosis
12. Biochemical testing
13. Histopathology
14. Flow cytometry
15. Blood cell screening

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