

**Rajiv Gandhi Institute of Veterinary Education and Research
Kurumbapet, Puducherry – 605 009**

A Government of Puducherry Institution

Affiliated to Pondicherry University

1. **Title of the programme:** Training Programme on PCR & Real-Time PCR for Molecular Diagnostics
2. **Type of the course:** 3 days Skill Training Programme
3. **Department conducting the Short-Term course:** Centre for Translational Research (CTR), Rajiv Gandhi Institute of Veterinary Education & Research (RIVER), Puducherry-605 009
4. **Dates** - Conducted during September, December, March, June of each Academic Year (**Contact Principal Faculty*)
5. **Details of Faculty associated with the course (Maximum two only)**

	Principal Faculty	Co-Principal Faculty
Name	Dr. V. M. Vivek Srinivas	Dr. J. Nikhil Kumar Tej
Designation	Assistant Professor, CTR	Assistant Professor, CTR
Contact No.	+91 97428 91992	+91 63044 78894
Email	vivekvet24@gmail.com	drnikhilkumartej@gmail.com

6. About the course

Molecular Diagnostics is the process of identifying a disease by understanding the molecules, such as proteins, DNA, and RNA, in a tissue or fluid, which form the markers of the disease directly or indirectly. Molecular diagnostics is a new discipline that captures genomic and proteomic expression patterns and uses the information to distinguish between two or more conditions at the molecular level. The conditions under investigation can be Infectious diseases or genetic diseases. Molecular diagnostics can be used in animals and plants, not just humans. Molecular diagnostics can also be used to identify foodstuffs, vegetables, meat types, food processing methods, etc., and can also be used in environmental monitoring to detect the presence of specific microorganisms in various samples, including food materials. The course will provide the theory and use of molecular techniques in diagnostics, placing more importance on nucleic acid-based methods. Molecular techniques and analytical techniques related to the development and use of diagnostics, such as polymerase chain reaction (PCR), quantitative PCR (qRT-PCR) will be emphasized.

The entire program/ course will be taught by highly qualified professionals and faculty members of CTR, RIVER who have expertise in various subjects (genomics, proteomics, microbiology, virology, parasitology, computational biology, and data analysis). This centre at RIVER has recently

been established as a new molecular diagnostics technique facility equipped with advanced model instruments in PCR / Real-time PCR, Electrophoretic apparatus, Gel documentation system, Bioinformatics tools, etc., at Puducherry shall provide a platform for successfully running the hands-on session of the course. We plan to maintain a maximum annual intake capacity of fifteen undergraduates to maintain an appropriate teacher-student ratio. 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.

7. Scope of the Course

Molecular Diagnostics has revolutionized the healthcare system by providing rapid and timely diagnosis to ease the treatment modalities. An increase in the incidence of life-threatening diseases, like bacterial, viral, and fungal infectious diseases, primarily drives the high demand for molecular diagnosis. Hospitals, industries, and research centres account for the largest share of this market. This means an immediate need for trained professionals in the healthcare sector, including molecular diagnostics. Though the molecular diagnostic technologies in India are at par with global standards, we still need to provide skilled professionals who can efficiently use the available resources and technology. Therefore, to meet the demand for skilled, qualified professionals in the field of molecular diagnostics, we plan to introduce a 3 days Skill Training Programme on PCR & Real-Time PCR for Molecular Diagnostics at the Centre for Translational Research (CTR), Rajiv Gandhi Institute of Veterinary Education & Research (RIVER), Puducherry.

8. Objectives of the Course

The course focuses on learning to provide systematic knowledge on the basics and principles of various molecular techniques for diagnosis and development, as well as troubleshooting for research and utilization in diagnosis.

9. Topics to be covered:

- DNA/ RNA extraction
- Basics of PCR
- Various Types of PCR and its application in Research
- Concepts of Real-time PCR
- Components of Real-time PCR
- Real-time PCR analysis terminology
- Real-time PCR fluorescence detection systems
- Melting curve analysis
- Real-time PCR result analysis and Interpretation
- Troubleshooting PCR/Real-time PCR
- Bioinformatics approach in genomic research
- Amplicon and Primer designing
- Absolute quantification in real-time PCR
- Relative Gene Expression studies using Real-Time PCR

10. Outcome:

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

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

11. Eligibility:

The minimal eligibility for the students to enrol in the Skill Training Programme course is to have UG/PG/PhD Students and Graduate.

12. Hours: 9.00 am to 5.00 pm for 3 days, offline mode (i.e. In-person)

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- Real-time PCR analysis terminology
- Real-time PCR fluorescence detection systems
- Melting curve analysis
- Result analysis and Interpretation
- Troubleshooting PCR/Real-time PCR
- Bioinformatics Approach in Genomic Research
- Amplicon and Primer designing
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- Relative Gene Expression studies using Real-Time PCR

14. Fee: Rs. 3,000/-

***** TRAINING CERTIFICATE** will be issued to the participants ***