INDUSTRIAL VISIT (2022-23)

On March 16, 2023, a group of 45 microbiology second-year students of EMEA Arts and Science College Kondotty visited the Veta Genomics Research Center in Thrissur. The visit was conducted with the aim of getting familiar with various techniques, including modern biosciences.

The students were divided into two groups, and they were guided by Jelna Jaki and Aiswarya, the research leads in Veta. They introduced and detailed the potential of several departments working in the lab, like molecular genetics, biotechnology, microbiology, biochemistry, hematology, and bioinformatics.

They gave detailed information on the machinery and use of various techniques related to molecular genetics, such as PCR (polymer chain reaction), gel electrophoresis, etc.The modern equipment, like vortex, centrifuge, qubit flourometer, different types of micropipettes, laminar air flow, chem analyzer, hematology analyzer, thermal cycler, RNA extraction mechine minus 20 freezer etc., and its working principles were detailed. They explained the tests related to veterinary diagnosis.

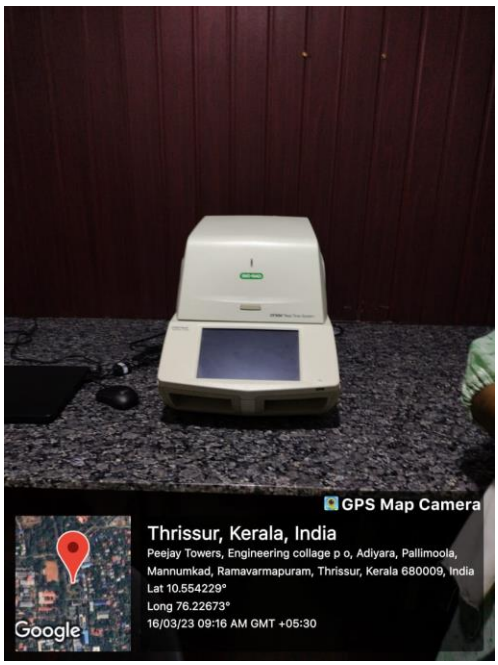
- **<u>RNA extraction machine</u>**

These innovative machines are designed to efficiently and precisely isolate RNA molecules from biological samples, such as cells or tissues. Utilizing cutting-edge technology, they employ a series of chemical and mechanical processes to break down cell structures, releasing RNA for further analysis. This crucial step in molecular biology research and diagnostics ensures the purity and integrity of RNA samples, enabling scientists to uncover vital insights into gene expression and biological functions. RNA extraction machines have become indispensable tools in modern research, driving advancements in various fields, from genomics to medical diagnostics.

- **Thermal cycler**

A thermal cycler, often referred to as a PCR machine, is an essential tool in molecular biology and genetics. It plays a pivotal role in a technique known as Polymerase Chain Reaction (PCR). This ingenious device precisely controls temperature cycles required for DNA amplification. By rapidly heating and cooling the DNA sample, a thermal cycler facilitates the replication of specific DNA segments, allowing scientists to create millions of copies of a target DNA region. This technology is invaluable in various applications, from genetic testing and DNA sequencing to forensic analysis and disease diagnostics. The thermal cycler's ability to perform PCR reactions with accuracy and efficiency has revolutionized genetic research and has broad implications for our understanding of DNA and genetics.

- **RT PCR**



Reverse Transcription Polymerase Chain Reaction (RT-PCR) is a powerful molecular biology technique used to amplify and analyze RNA molecules. In RT-PCR, RNA is first converted into complementary DNA (cDNA) through the reverse transcription process. This cDNA serves as a stable template for subsequent PCR amplification. The technique is instrumental in studying gene expression, detecting viruses like SARS-CoV-2, and diagnosing diseases by quantifying RNA levels in a sample. RT-PCR has been a game-changer in both research and clinical settings, providing precise, sensitive, and rapid insights into RNA-based processes and pathogens.

- **Centrifuger**

A centrifuge is a powerful laboratory instrument that revolutionizes the separation of different components within a liquid mixture. It operates on the principle of centrifugal force, rapidly spinning samples at high speeds. By harnessing this force, a centrifuge effectively separates substances of varying densities, such as cells, proteins, or DNA, into distinct layers or pellets. This process is invaluable in a wide range of scientific disciplines, including biology, chemistry, and clinical diagnostics, enabling precise separation and purification of substances for analysis and research. Centrifuges are indispensable tools for scientists and researchers seeking to unlock the secrets hidden within complex biological and chemical samples.

- **Chem analyzer**

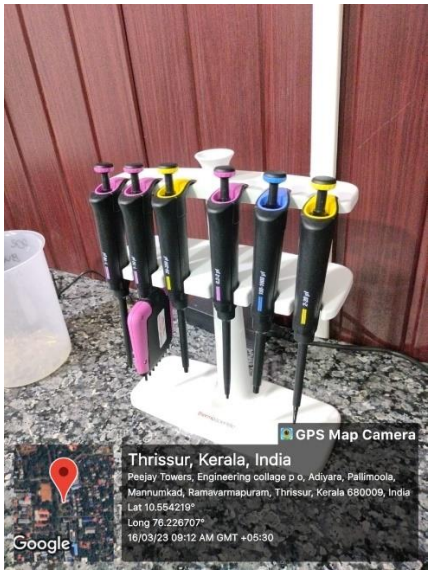
A chemical analyzer, often referred to as a chem analyzer, is a sophisticated laboratory instrument used for analyzing and quantifying the chemical composition of various substances. These versatile machines are a vital component in clinical laboratories, pharmaceutical research, and industrial quality control processes. Chem analyzers can perform a wide range of tests, including blood chemistry analysis, urine analysis, and the measurement of various chemical parameters in liquids and solutions. By automating the testing process and providing accurate, rapid results, chem analyzers have revolutionized the field of chemical analysis, enabling more efficient and precise data collection in scientific and healthcare settings.

- **Minus 20 freezer**

A minus 20 freezer, often referred to as a -20°C freezer, is an essential piece of laboratory equipment used for the storage of biological samples, chemicals, and other temperature-sensitive materials at a temperature of -20 degrees Celsius. These freezers play a vital role in preserving the integrity and viability of valuable samples, such as DNA, RNA, proteins, and vaccines. Their ability to maintain a consistent, low temperature ensures that stored materials remain stable over extended periods, safeguarding the quality and reliability of scientific experiments, clinical research, and pharmaceutical work. Minus 20 freezers are a cornerstone of laboratory infrastructure, offering peace of mind by protecting valuable assets critical to scientific and medical advancements.

Other equipments introduced were

- Micropipette



- Class 2 Biosafety cabinet

- Laminar air flow cabinet

- Gel electrophoresis apparatus

The lab authorities were very friendly with the students and made everything clear. The principal scientist and founder of Veta Genomics, Jismon Thomas, and Sajesh KS interacted with the students. It is recognized how important evolving modern technologies are in the life sciences. The lab faculty shared the information with the students through very clear and precise explanations.

The journey through VETA GENOMICS helped us acquire many new knowledges.

THANK YOU..

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The Principal
EMEA College of arts and science
Kondotty , Malappuram

Dear sir

Ref, Veta genomics Research Centre

As part of their second-year industrial visit, 51 B.Sc. Microbiology students and two faculty members from your prestigious college conducted a visit to the VGRC Thrissur on March 16, 2023.

We are grateful for the interest that the teachers and students have shown in latest technologies used in the different microbiological field. We are happy to see that instructors and students are interested in learning about the various equipments. We wish the students all the best in their upcoming pursuits. We are delighted to have the institution enroll further student batches at VGRC.

With warm Regards

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