

## The University of Mauritius offers MSc Bioinformatics with Molecular Biology

In August 2010, the University of Mauritius introduced a two-year "MSC course in Bioinformatics with Molecular Biology" This program is under the framework of Bioinformatics Network Node of SANBio which has, as its main objective: *"to create a network of scientists in southern Africa for the development and implementation of a transnational program of work in bioinformatics"*.

The course is being run on a part time basis under the Faculty of Agriculture. There are 12 students enrolled in the second year of the course coming from Mauritius (9) Botswana (1) and Zimbabwe (2).

Bioinformatics is a multidisciplinary field and requires inputs of data from different subjects like biology, computer science and mathematics. This emerging field helps in collection, manipulation, interpretation and integration of different types of biological information to discover new biological insight. Thus bioinformatics has emerged to help in fast research and leads to quick inventions by providing readily available information with the help of updated, reliable and robust software and bioinformatics tools and databases. In addition, it is an invaluable tool that can interlink information from different areas like biology, statistics, genomics etc to make the research faster.

Over the past few decades rapid developments in genomic and other molecular research technologies and development in information technologies have been combined to produce a tremendous amount of information related to molecular biology. The introduction of this course to the University of Mauritius has made it possible for students to be connected with the latest emerging biotechniques and updated research and development across the world.

The course has provided student access to unlimited amount of information just by using appropriate bioinformatics tools and search engines. Through this programme students can now create simple algorithms, analyze various types of data such as nucleotide and amino acid sequences, gene expression, sequence alignment, genome assembly and phylogeny. However being the first batch to enroll in this course the students have encountered some challenges including limited access to reference materials and software. Access to online international journals and newsletters would help in updating students on ongoing research. In order to improve the delivery of the programme the students have suggested that access to the bioinformatics laboratory should be extended to allow students ample time to exploit the bioinformatics software that are not accessible online. The creation of a bioinformatics society in the South African region would also be beneficial in providing a platform for networking and sharing knowledge, experience and difficulties being encountered in the sector of bioinformatics in the region.

I am presently working as a Forensic Biologist at the Mauritius Forensic Science Laboratory. The Forensic Science Laboratory (FSL) has different sections ranging from DNA, Drugs and Toxicology, to Ballistics and Documents. The FSL aims to provide the best possible services to facilitate criminal justice process and other related cases. Our vision is to be the leading organization offering Forensic science and Investigative services in Mauritius and in the Southern African region.

Molecular biology tools have enhanced the capabilities of the Forensic Science Laboratories more than any other scientific field. Forensic scientists are constantly searching for better,

faster, and more efficient ways to increase the first-pass success rate of forensic sample analysis. The massive amount of high throughput data generated during Forensic DNA analysis cannot be analyzed without the knowledge of bioinformatics, software, tools and application.

The FSL which has been recently awarded ISO 17025 Accreditation, strives to maintain and improve upon work being done, using the latest technologies, software and tools to provide up to date and internationally recognized services, and like many other countries is establishing forensic databases to store DNA profiles of crime scenes of known offenders and apply DNA testing. The role of Bioinformatics with statistical and technological advances such as DNA sequencing, in particular Bayesian networks, will provide an effective way of evidence organization and inference.

Bioinformatics will surely be integrative part of future developments be it in querying from existing databases using search engines, improvements to increase sensitivity of techniques of DNA extractions, microbial forensics, pharmacogenetic information and phenotypic inference of DNA.

Bioinformatics is the driving force for research and development in different sectors such as in genomics, proteomics, phylogeny, drug design or high throughput techniques. Bioinformatics has a challenging future in Mauritius as it integrates sectors such agriculture, environment, medical research, veterinary labs, food safety, agricultural biotechnology, biodiversity, crop production and forensic science among others. All these sectors generate massive amounts of data that have to be analyzed, stored and retrieved and stored in. The application of bioinformatics tools provides rapid, robust and reliable and updated means of integrating all the data generated into useful information.

The alloy between molecular biology and bioinformatics is not too difficult to be made. We may like only one disciple out of the two, whether the molecular biology part or the programming part only but in the end together they stand united for this new era.

Molecular biology and bioinformatics is the new era in the medical field for the screening and diagnosis of diseases. This has been shown with the implementation of a new molecular biology suite in the health sector.

With the emergence of novel infections and re-emergence of infections, it is a challenge in the health sector to provide accurate diagnosis in a short time delay. Hence it will be advantageous having molecular biology and bioinformatics as a tool for counteracting pandemics, epidemics via diagnosis of these infections as early as possible.

In my opinion, the future lies in molecular biology and bioinformatics for developing countries like Mauritius", says **Mr Mitradev Pattoo**

*by Miss Auckloo Asha and Mr Mitradev Pattoo*  
**2<sup>nd</sup> year students - MSc Bioinformatics with Molecular Biology**