GENOMICS, PERSONALIZED MEDICINE AND ETHICS
(July 31, 2017- August 11, 2017)
Organized by:

**Department of Biotechnology and Centre for Medical Diagnostic and Research,
Motilal Nehru National Institute of Technology Allahabad**
Allahabad – 211004 (India)

Course Overview

Genomics and other omics technologies are playing an important role in health care and are being increasingly used to manage personal health. Advances in genomic and clinical science have created an innovative opportunities to tailor health care to an individual. Personalized medicine is a strategy based on individual phenotyping of profiles rather than the long established 'one-size-fits-all' approach. It is based on a multidisciplinary approach translating advances in basic science and drug discovery into development of clinical practice. It has wide implications for public health, preventive interventions and for the rational design of screening programs. Personalized medicine identifies elements that predict the individuals' predisposition to disease and their response to treatment. The relatively new tools and methods of personalized medicine integrate genomic information with clinical and laboratory data, which enables classification of unique disease susceptibility, better diagnoses, earlier interventions, targeted and more efficient drug therapies and customized treatment. There are two key challenges in successfully implementing such genomic based innovations; one is computationally intense data processing and interpretation and second is lack of proper regulatory measures. The aim of this course is to introduce to a general audience the concept of "personalized medicine" and the impact that our enhanced understanding of the human genome has had on modern clinical practice. The course will also emphasize relationship between genomics and (bio)ethics. The focus will be on the moral problems generated by molecular genomics research, and the development and application of new knowledge in clinical genetics and personalized medicine. In addition, regulatory requirements for personalized medicine and issues such as privacy and informed consent will be covered.

Course objectives

- Designing customized bioinformatics and statistical solutions for high-throughput sequencing and array data to identify diagnostic, prognostic and therapeutic target prediction biomarkers.

- Genetic alterations resulting in a disease, clonal landscape of diseased cells as well as integrative omics to assign genomic aberrations into a functional context using disease specific traits as well as public databases (TCGA/ENCODE).

- Current and emerging genome technologies for clinical and personal applications

- Genomic approaches for risk assessment, prevention, prognosis, and treatment of complex multifactorial disease states

- The ethics and regulatory issues involved in application of genomics based strategies to personalized medicine and its impact on health care.

The learning outcome of the course includes understanding basic genetic concepts of gene expression, mutation, and how genes are "passed on" to the next generation alongside the principles of risk determination and provide examples of how genetic testing is currently used to inform medical management. The course also covers the development of "targeted therapies" from drug discovery, through clinical trials, to regulatory approval, in both national and international contexts, big data interpretation and integration of genomics, epigenomics regulatory as well as microbiome information to formulate personalized therapeutic interventions. The course will also include insights into the future perspectives of personalized medicine, pros and cons of clinical genetic testing in prenatal, pediatric and adult settings and ethical and regulatory aspects of genomic based medicine. Insight into the future perspectives of personalized medicine.

Who can attend?	This course is designed for participants from various backgrounds: researchers working in the field of medicine, bioinformatics, molecular biology, human genetics, biotechnology, biomedical sciences, life sciences, genetics and biology and physicians doing research that has a genetic component professionals working in the pharmaceutical industry, professionals in the areas of ethics, philosophy and theology, and students.
Date	July 31, 2017- August 11, 2017
Venue	Center for Medical Diagnostics and Research (CMDR), Motilal Nehru National Institute of Technology Allahabad, Allahabad, U.P.-211004 (India)
Accommodation	• The participants (Student/Research Scholar) will be provided with single/shared accommodation on payment basis based on the availability in the Hostel. • Accommodation can also be provided in the Executive Development Centre of the Institute on payment basis subject to availability. • Accommodation in the campus can be provided subject to availability and on 'first come first served' basis. • All participant have to bear the cost of food during the course.
Course Fee	One time registration at GIAN portal http://www.gian.iitkgp.ac.in/GREGN/index The participation fees for attending the course is as follows: _(see table below)_ ➢ The above fee includes all instructional materials, computer use for tutorials & assignments (if any). ➢ Minimum 90% attendance necessary to be eligible for certificate of participation/attendance. ➢ Appearing for evaluations/examinations during the course is necessary for certificate of grades in the course.
Bank Details	Account Name: GPME 2017 Account No.: 718400301000242 Bank Name: Vijaya Bank. Branch: MNNIT Allahabad. U.P. India. Branch code : 007184; MICR code : 211029004; IFSC Code :VIJB0007184. Last Date of Registration: July 18, 2017.

Foreign Participants	$300
Industry/Research Organizations	Rs. 5,000/-
Academic Institutions (Faculty)	Rs. 3,000/-
Academic Institutions (Student/Research Scholar)	Rs. 1,000/-

Course topics

Navigating the world of genomics, Regulatory and epigenetic landscapes of mammalian genomes, Large scale expression analysis: Transcriptome, Studying big data, Hands on Training, Pharmacogenomics, Pharmacogenetics and Individualized medicine, The Clinic: making precision medicine a reality through genomics, The Diagnostic Lab: Biomarkers in precision medicine, Genomics medicine : patent and socio-economics controversies.

Foreign Faculty

Vasu Punj, Ph.D is presently working as Associate Professor in Keck School of Medicine at the University of Southern California, Los Angeles, USA. Dr. Punj's current research is focused on the development of bioinformatics solutions to genomics-based personalized medicine strategies for solid tumours and haematological malignancies. In particular, he is interested in studying functional cancer genomics by intersecting DNA methylation, coding and non-coding RNA profiles, DNA-sequence variations as well as chromatin modifiers such as transcription factors and histone markers. The ultimate goal is to translate genomic data into clinic by identification of diagnostic biomarkers, prognostic and drug response predictions in cancer. In addition, he is also involved in guiding regulatory documentation for genomics-based personalized innovations. His work provides an important link between basic, epidemiological and translational research.

Host Faculty & Principal Coordiator

Dr. Shivesh Sharma is presently Associate Professor and Head, Department of Biotechnology at Motilal Nehru National Institute of Technology (MNNIT), Allahabad, Uttar Pradesh, India. His research interests include microbiology, environmental biotechnology, development of effective, safe bioformuations and doses leading to infectious disease management which consists of identifying the microbial causes of an infection, initiating if necessary antimicrobial therapy against microbes, and controlling host reactions to infection.

Coordinator

Dr. Ambak Kumar Rai is presently Assistant Professor, Department of Biotechnology at Motilal Nehru National Institute of Technology (MNNIT), Allahabad, Uttar Pradesh, India. His research interests include medical biotechnology, immune regulation at genetic level, immune responses against intracellular infections and immune regulation during intracellular infection.

Contact

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