



Institute of Eminence  
(University of Delhi)



Deshbandhu College  
(University of Delhi)



Hansraj College  
(University of Delhi)



Dr. M.G.R Educational  
& Research Institute



Quanta Calculus Pvt  
Ltd, India



NyBerMan Bioinformatics  
Orleans, France

## ONE WEEK INTERNATIONAL VIRTUAL WORKSHOP ON

# Computational Genomics for NGS data analysis

## Concepts, Methods & Applications

### JOINTLY ORGANISED BY

- Delhi School of public Health, Institute of Eminence, University of Delhi, India
- DBC I4 Center Deshbandhu College, (University of Delhi), New Delhi, India
- Hansraj College, North Campus (University of Delhi), New Delhi, India
- Dr.M.G.R Educational & Research Institute University, India
- NyBerMan Bioinformatics Europe, Orleans, France
- Quanta Calculus Pvt Ltd, India



**26<sup>th</sup>-30<sup>th</sup> November, 2022**

## **Institute of Eminence, University of Delhi (Delhi School of Public Health), India**

The institution of eminence (IoE) aims to determine the thrust areas in research and teaching at the University, which will have an interdisciplinary and multidisciplinary focus with an eye on their societal relevance. One of the School under IoE, Delhi School of Public Health (DSPH), proposes an interdisciplinary center of learning comprising of diverse, untouched, gap-areas in Public Health with the purpose to develop wellness, well-being strategies and technologies underpinned by social relevance and based on principles of quality and equity. DSPH proposes research in intertwined disciplines of Public Health with Science, Technology and Policy with the aim of proposing such course programs that enable learning outcomes with direct impact on community health. Concomitantly, DSPH would undertake collaborative programmes with University academic Departments and Centers to meet demands of changing health science research and strengthen interdisciplinary research in key areas of Public health in the country.

**Website:** <https://www.ioe.du.ac.in/delhi-school-of-public-health/>

## **Deshbandhu College, University of Delhi, India**

Established in 1952, Deshbandhu College, is the oldest amongst all colleges under University of Delhi, South Delhi having more than 5000 students taking admission each year. Ranked 28th in by in the NIRF 2022 Ranking under UG Colleges, it boasts of having nearly 200 research publications in SCI/SCOPUS/UGC-CARE indexed international and national referred journals and has received more than Rs. 75,00,000/- in research grants in the year 2021-22. The college has been awarded with “DBT-Star College” Scheme by Department of Biotechnology, under which DBC I4 Centre (Student Research Centre) was established in the college for interdisciplinary research. The college has 4 university approved Research laboratories with more than 20 PhD scholars and 2 Post-Doctoral Research fellows engaged in full-time research activities. It has the largest collection of books and journals, print and digital, in its library, ranked 1st by DRDO. The college has recently developed about 4 acres of green landscape offering a variety of more than 35 species. The college campus is fully environment friendly having installed solar panels to maximize alternate power resource management.

**Website:** <https://www.deshbandhucollege.ac.in/>

## **Hansraj College, University of Delhi, India**

Hansraj College is one of the largest constituent colleges of the University of Delhi. The college was founded by the D.A.V. College Managing Committee on 26th July, 1948. Hansraj College is a premier institution dedicated to teaching and research. It has highly qualified academicians who impart education in Science, Commerce, and Arts at undergraduate and graduate levels to more than 5000 students on its rolls. The college has consistently demonstrated outstanding performance in academics, sports, and extracurricular activities. The college has completed 75 years in the realm of imparting higher education. Hansraj College is one of the largest constituent colleges of the University of Delhi and has been ranked as one of the top five colleges for science, arts and commerce several times in the last decade. The faculty and students of the college have contributed immensely to the fields of academics, sports and culture. The college faculty is dedicated towards the growth and development of the institution academically and administratively and constantly thrive for excellence. Hansarians have been placed in diverse professions and services worldwide and are bringing fame and laurels to the institution.

**Website:** <https://www.hansrajcollege.ac.in/about/thecollege>

## **NyBerMan Bioinformatics Europe, Orleans, France**

We are one of the Internationally recognised Bioinformatics (BIT) service firms founded in 2019 under the name of Lets Learn Bio-IT school. Later, it was launched as a global BIT service platform called NyBerMan Bioinformatics Europe in 2021, where anyone from around the globe can access top-notch training, services, project outsourcing, and consultancy in BIT and its allied domains. We provide expert services in structural bioinformatics, chemoinformatics, molecular modeling, computational drug design, Molecular Dynamics Simulations, OMICS, data science, AI/ML, health informatics, and Intellectual Property Rights. We have completed various projects: outsourcing, consultation, Internship, workshop, and other skill development programs. We have a history of collaborations with reputed universities, colleges, and industries such as Tamilnadu agricultural university, Dr.M.G.R Educational & Research Institute University, Vignans Foundation for Science, Technology & Research Deemed to be university, Zastr Innovations, ALTEM technologies, and Schrodinger Pvt Ltd.

**Website:** <https://www.nyberman.com/>

## **Academic Staff College of Dr. M.G.R Educational & Research Institute University, India**

Dr. M.G.R. Engineering College was founded in 1988, and the Thai Moogambigai Dental College was started in the year 1991. Both the colleges acquired Deemed University status in 2003 as Dr. M.G.R. Educational and Research Institute as per the orders of the University Grants Commission, New Delhi, and the Union Ministry of Human Resources and Development, Government of India, New Delhi. The 21st century poses a lot of challenges that could be overcome with the help of education and technology. Keeping this in mind Dr. M.G.R Educational and Research Institute University was started with a vision of providing a better foothold for the students of today to face the challenges. Dr. M.G.R. Educational and Research Institute University has preserved to nurture and groom young men and women through Engineering, Medical, Dental, and Humanities and Sciences. Dr.MGR Educational and Research Institute University was accredited by various bodies such as NAAC, NBA, and ABET. Recently the university has been accredited with an A+ grade by NAAC.

**Website:** <https://www.drmgrdu.ac.in/>

## **Quanta Calculus Pvt Ltd, India**

Quanta Calculus is an applied science consultancy provider, and Contract Research Organization (CRO) founded under the Make in India initiative, to transform ideas and theoretical concepts, supported by advanced computational methods and experimental techniques, into translational products. At Quanta Calculus, we are a team of multidisciplinary experienced researchers with highly innovative and product oriented mind-set covering six different research divisions, including Bioinformatics, Biotechnology, Microbiology, Nanotechnology, Medical chemistry, Therapeutics Vaccines, and Drug formulation, devoted to provide innovative, customizable, and cost-effective research-oriented products to improve the quality of human life. We incorporate scientific excellence and product development strategy in all that we do. We recognize and understand the importance of providing leading solutions in our research domains and we have a strong track record in providing scientific insights and judicious solutions to our clients through the development process. We believe in having a data-driven approach and a collaborative partnership with our clients; working closely to ensure that we provide customized solutions for your unique translational research-oriented product development. Besides, we also provide skill development training on experimental and soft skills to assist researchers in their scientific journey.

**Website:** <https://www.quantacalculus.com/>

DATE	TOPICS	TIME	RESOURCE PERSON
26-11-2022 (Saturday)	Inauguration, welcome address, and instructions session	1:00 PM – 1:45 PM	<b>Dr.Saurabh Gupta</b> Postdoctoral Researcher, Curtin University, Perth, Australia  Advisor & Tutor NyBerMan Bioinformatics
	<b>Live Session - I</b> Introduction to genomics, NGS and transcriptomics	2:00 PM – 3:30 PM	
	<b>Live Session - II</b> Introduction to Linux: navigate the file system, create, copy and move Linux command-line and writing bash scripts	4:00 PM – 6:00 PM	
27-11-2022 (Sunday)	<b>Live Session - I</b> Genomics basics like N50, coverage, depth of sequencing Replicates, need for multiple libraries How to estimate genome size Ask for sequencing data of a specific coverage from sequencing companies	2:00 PM – 3:30 PM	<b>Dr.Meenakshi Iyer</b> Postdoctoral Fellow, National Centre of Biological Science, Bangalore, India  Advisor & Tutor NyBerMan Bioinformatics
	<b>Live Session - II</b> Reading and interpreting raw reads from sequencing data QC analysis of sequencing data using FASTQC tool Trimming sequencing adapters and bad quality bases from the sequencing reads	4:00 PM – 6:00 PM	
28-11-2022 (Monday)	<b>Live Session - I</b> Basics of microarray -basics of RNA seq Differentially expressed genes: significance & methods	2:00 PM – 3:30 PM	<b>Dr.Priyanka Narad</b> Associate Professor, Centre for Bioinformatics Amity University, India  Advisor & Tutor NyBerMan Bioinformatics
	<b>Live Session - II</b> GEO database Identification of differentially expressed genes for microarray data using R Identification of differentially expressed genes for RNA seq using deseq2	4:00 PM – 6:00 PM	
29-11-2022 (Tuesday)	<b>Live Session - I</b> Introduction to systems biology & genomics Principles and applications Network biology concepts: graph theory, types of networks, network properties Reconstruction and analysis of biological networks, network annotation, visualization & enrichment analysis (gene ontology and pathways)	2:00 PM – 3:30 PM	<b>Mr.Pranavathiyani G</b> Doctorate Student, Pondicherry University, India  Advisor & Tutor NyBerMan Bioinformatics
	<b>Live Session - II</b> Resources for systems biology research: databases, servers and tools <i>Hands on/demo sessions</i> Bioinformatics databases and tools for systems genomics research Network analysis and visualization using cytoscape and R (igraph and stringdb) Practice exercises & Evaluation quiz	4:00 PM – 6:00 PM	
30-11-2022 (Wednesday)	<b>Live Session - I</b> Extensive discussion & clarifying doubts about all the topics	2:00 PM – 3:30 PM	<b>Above all</b>  Advisor & Tutors NyBerMan Bioinformatics
	<b>Live Session - II</b> Concluding Remarks, Valedictory Session & Feedback	4:00 PM – 6:00 PM	

NOTE:

- 1. Practice & Revision: 1:00 PM to 2:00 PM (Everyday except day 1)
- 2. Theory sessions (Online): 2:00 PM to 3:30 PM (Everyday)
- 3. Hands-On Sessions: 4:00PM to 6:00PM (Everyday)
- 4. Software Installations/Assessment and Evaluation: 6:30 PM to 7:30PM (Everyday).

ORGANISING TEAM

<b>DESHBANDHU COLLEGE &amp; DELHI SCHOOL OF PUBLIC HEALTH &amp; INSTITUTE OF EMINENCE UNIVERSITY OF DELHI</b>	
<b>Dr. Indrakant K. Singh</b> Program Convenor Fellow, Delhi School of Climate Change & Head, DBC I4 Centre, Deshbandhu College	<b>Prof. (Dr) . Rajiv Aggarwal</b> Chairman/Principal Head, DBC I4 Centre, Deshbandhu College
<b>HANSRAJ COLLEGE UNIVERSITY OF DELHI</b>	
<b>Dr. Archana.Singh</b> Fellow, Delhi School of Climate Change (IoE) & Department of Botany, Hansraj College	<b>Prof. (Dr) . Rama</b> Principal Hansraj College
<b>ACADEMIC STAFF COLLEGE OF DR.M.G.R. EDUCATIONAL &amp; RESEARCH INSTITUTE UNIVERSITY</b>	
<b>Dr.K.Gomathi</b> Dean-ASC, Dr.M.G.R Educational & Research Institute University	<b>Dr. Malini Pande</b> Additional Registrar-P&D Director-ASC, Dr.M.G.R Educational & Research Institute University
<b>NYBERMAN BIOINFORMATICS</b>	<b>QUANTA CALCULUS Pvt Ltd</b>
<b>Dr. Mahesh Velusamy</b> Program technical & e-Learning support CEO & Founder, NyBerMan Bioinformatics & Lets Learn Bio-IT School	<b>Dr. Vivek Dhar Dwivedi</b> Founder & Director <b>Dr. Shiv Bharadwaj</b> Co-Founder



## ABOUT THE PROGRAMME

This virtual workshop will provide an overview of genomics and its potential applications in various fields of life sciences, from basic sciences to healthcare and biomedicine. This workshop covers various aspects of computational genomics, including different sequencing technologies, experimental setup, and steps for NGS data analysis (QC, assembly, annotation, gene expression, and network analysis). In addition, the participants will get the foundations of computational tools and methods related to these topics with hands-on experience exploring NGS data. Tutors who deliver all the sessions have >15 years of experience in genomics.

## ELIGIBILITY

- The program is interdisciplinary \* and is open to all interested participants.
- All **faculty members** (Permanent/ Temporary/ Adhoc/ Guest), **Industry, Research Scholars (PhD/Postdoc/JRF)** and **UG/ PG students** from any university/college are eligible to participate.

(\*Biological Science/ Physical Science/ Chemical Science/ Environmental Science/ Mathematical and Computer Sciences)

## PROGRAM HIGHLIGHTS

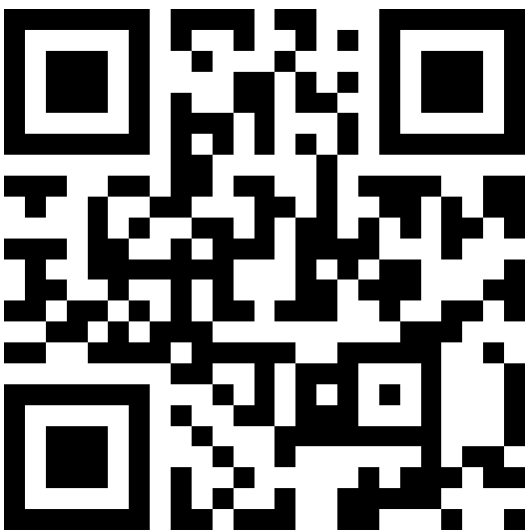
- Unix/Linux for Genomics
- NGS technologies: Types, File formats and tools
- Foundations of Genomic Applications
- Genome Assembly and Statistics
- Gene prediction and Annotation
- Transcriptomics- Gene Expression Analysis
- Resources and tools for NGS data analysis
- Enrichment analysis (Pathways, Gene Ontology)
- Network Analysis
- Experimental setup, Quality Control



## REGISTRATION DETAILS

Interested participants are requested to follow the steps mentioned below in order to register for the workshop:

- **NOTE: Fee is Non-Refundable**
- Pre-registration for the program is through online mode only.
- Participants are required to fill out the registration form using the following link. (Please ensure that you have payment & professional proof to finish the registration)
- Attendance norms are strict. Participants are required to clear the assessment component to get the e-certificates.
- Further details will be communicated to the registered participants.



Registration link  
<https://bit.ly/3WeHk0S>  
Deadline: 20/11/2022  
**Registration will be on first come-first serve basis**

## REGISTRATION FEES

Category	India	Others
Industry	₹4000	\$100
Academics/Faculty	₹1500	\$75
Research Scholars (PhD/PostDoc/JRF)	₹1000	\$50
UG/PG Student	₹750	\$25

The participants are required to pay the registration fee above via NEFT/IMPS/UPI/MasterCard/PayPal mentioned in the Next Page/Registration form

## PAYMENT ACCOUNT DETAILS

### Indian Participants

Account Number: 09031000101901

Account Name: Principal, Deshbandhu College

IFSC Code: PSIB0000903

Bank Name: Panjab & Sind Bank

Branch Name/address: Deshbandhu College, Kalkaji, New Delhi 110054

### International Participants

Option 1: Through Master Card (details mentioned in Registration form)

Account Number: 09031000101901

Account Name: Principal Deshbandhu College

Branch Name: Deshbandhu College

SWIFT CODE: PSIBINBB005