

Title: “Inter-National Summer School programme on Communications of Molecular Genetic Live Stream- 2018”- (CMGL)

- 1) Theme of the summer School:** Emerging Trends in Molecular Microbiology.
- 2) Name of the Coordinator:** Dr. R. Malathi, Professor & Head,
Department of Genetics, Dr. ALMPGIBMS Campus
University of Madras,
Taramani, Chennai-600113. India.
Co-Cordinator: Dr.B. Usharani
- 3) Proposed dates:** 20.04.2018 to 30.04.2018
- 4) Concept Note:** **Emerging Trends in Molecular microbiology**

The CMGL Summer School in Molecular Biology includes a series of required and theoretical courses that cover various topics related to cellular and molecular biology of cancer, molecular genetics of prokaryotes and eukaryotes, immuno-oncology, model organisms and approaches in systems biology.

The Summer School also includes required and electives practical courses (CMGL A-B-C-D-E) that emphasize hands-on laboratory training related to molecular biology Genomic DNA & Plasmid DNA isolation, qRT-PCR, cloning ,sequencing, construction of expression vectors), cell analysis (microscopy, flow cytometry), expression and purification of proteins (FPLC chromatography functional genomics, proteomics, high-throughput sequencing, bioinformatics (databases, network analysis, modeling of the structure of macromolecules) and the use of model organisms, Transgenic plants (mouse, yeast, nematode, fruit fly). Throughout these practical courses, students conduct mini-research projects using the CMGL core facilities. During the CMGL Summer School in Systems Biology, you will benefit from the expertise and support of an impressive team of researchers, professors and scientists from the University of Madras, Sri Ramachandra University, M.G.R Medical University. By its rich and dynamic programming and its innovative academic approach, the CMGL Summer School in Systems Biology provides high-level training that helps students become familiar with the equipment and scientific resources available at CMGL and prepares them for a promising career in a variety of areas related to cancer and biomedical research in Mycobacterium Tuberculosis.

5)Details of Sub- Themes:

Short description of the organising Summer school programme :

Within the framework of the Academy, University of Madras plays a tremendous role in high quality leadership in Teaching, and Training the students in scientific research activities according to the concept of education. The Summer School programme (CMGL-2018) offered by Department of Genetics, University of Madras organises and coordinates various educational and research activities, as well as being responsible for providing a good training Research programme in the field of Genetics, Molecular biology and Bioinformatics. The

basic pedagogy and Research methodology, based on practical handling to the students in the summer school programme motivate them to reach greater heights in their carrier. The aim of the summer school programme (CMGL-2018) course has been the comprehensive and many-sided handling of molecular biology techniques both in practical work and in the pedagogical, scientific lectures. The programme consists of daily solfege lessons and methodology classes as well as conducting lessons and practical handling of Molecular microbiological techniques.

Topics/techniques:

- DNA cloning (and library construction)
- Gene expression analysis
- PCR and quantitative RT-PCR
- Genomics and Metabolomics
- DNA sequencing, including NextGen & RNA-seq
- Techniques of genetic analysis
- Analysis of genome Biology and Technology
- Transcriptomics and Proteomics.
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6)Time – Table :Course Schedule of summer school workshop Agenda

Session Description from **20.04.2018 to 25.04.2018**

Lecture and lab work begin on 20.04.2018 forenoon.

Summer school programme Agenda:(CMGL-2018)

Day 1	Session Descriptions
9.00am to 10.00 am	Registration
10.00am to 10.30 am	Inaugural speakers 1. Dr. R. Malathi 2. Dr. B. Usharani
10.30am to 11.30 am	Dr. Karthikeyan - Genetherapy
11.30 am to 12.30pm	Dr. B. Usharani- High throughput sequencing technologies, NGS RNA Seq
12.30pm to 1.00pm	Dr. charles Emmanuel Jebaraj- Microarray data analysis and cancer biology
1.00pm to 2.00pm	Lunch
2.00pm to 5.00pm	Dr. B. Anandan Molecular biology techniques.

Day 2	Session Descriptions
9.00am to 10.00 am	Dr.B. Usharani– Proteomics Techniques
10.00am to 11.30 am	Dr.Rajeswara rao– Utility of DNA study in the genetic evolution of Benthic forminifera.
11.30 am to 12.30pm	Dr. Rjeswari hari– Pharmacogenomics of medicinal plants
1.00pm to 2.00pm	Lunch
2.00pm to 5.00pm	Dr. B. Usharani PCR and qRT-PCR Techniques and DNA cloning

Day 3	Session Descriptions
9.00am to 10.00 am	Dr. Karthikegyan- Strcture biology: Protein structure & function
10.00am to 11.30 am	Dr. Elancheliyan- Vaccines
11.30 am to 12.30pm	Dr. Suganthi- Microbiological methods
1.00pm to 2.00pm	Lunch
2.00pm to 5.30pm	Dr. Mathan- Methods in Genome biology and Transcriptomics

Field Visit Description

Day 4 & 5	Session Descriptions
9.00am to 1.00 pm	Dr. M. Muthuraj, Microbiologist, STDC Director, IRL- Puducherry, GHCD (FIND- Molecular Genetics Techniques: BSL 111 Containment Laboratory, LJ Culture methods MGIT and Microscopic Techniques.
1.00pm to 2.00pm	Lunch
3.00 pm to 5.30 pm	Dr. B. Usharani Molecular Line probe Assay- Hain life sciences Germany.

Day 5 & 6	Session Descriptions
9.00am to 1.00 pm	Dr. Charles Emmanuel Jebaraj.W.,Ph.D. ICMR-IF(StanfordUniversity) Professor and Head, Department of Biotechnology Faculty of Biomedical Sciences, Technology & Research, Sri Ramachandra University,-- Fermentation Techniques and Quantitative PCR.
1.00pm to 2.00pm	Lunch
3.00 pm to 5.30 pm	Dr Karthe Professor and Head- Strcture biology: Protein structure & function. Crystallograhic Techniques.

Day 7 & 8	Session Descriptions
9.00am to 1.00 pm	Dr. R. Malathi- Practical Handling Molecular Biology Techniques
1.00pm to 2.00pm	Lunch
3.00 pm to 5.30 pm	Dr. B. Usharani – Practical Handling of Molecular Biology Techniques- Genexpert assay, Fluorescent Microscopy, CBNAAT assay.

Day 9 & 10	Session Descriptions
9.00am to 1.00 pm	Dr. R. Malathi & Dr.B. Usharani Internal Assesment for Students & Discussion.
1.00pm to 2.00pm	Lunch
3.00 pm to 4.00 pm	Valedictory Function
4.00 pm to 5.30 pm	Certificate Distribution

7)List of Resource persons (tentative):

- 1) Dr. Karthikegyan, Professor and Head, Department of Pharmacology and Environmental toxicology, Dr. ALMPGIBMS Campus, University of Madras, Taramani, University of Madras.
- 2) Dr. Charles Emmanuel Jebaraj.W.,Ph.D. ICMR-IF(Stanford University) Professor and Head, Department of Biotechnology Faculty of Biomedical Sciences, Technology & Research, Sri Ramachandra University,
- 3) Dr. M. Muthuraj, Microbiologist, STDC Director, IRL-Puducherry Lab, Government Hospital for Chest Diseases, Puducherry- 605006.
- 4) Dr. B. Usharani, Assistant professor, Department of Genetics, Dr. ALMPGIBMS Campus, University of Madras, Taramani, University of Madras.
- 5) Dr. P. Karthe Professor and Head, Department of Crystallography and Biophysics, Guindy campus, University of Madras
- 6) Dr. B. Anand. Assistant professor, Department of Genetics, Dr. ALMPGIBMS Campus, University of Madras, Taramani, University of Madras.
- 7) Dr. Rajeswara rao , Associate professor, Department of Applied geology, Guindy campus, University of Madras.
- 8) Dr. Rajeswari Hari, Professor and Head, Department of Biotechnology, Dr. M.G.R educational and research institute university, Maduravoyal, Chennai-95.

- 9) Dr. Elancheliyan, professor and Head, Department of Microbiology, University of Madras, Taramani, University of Madras.
- 10) Dr. Mathan, Assistant professor, Department of Biomedical Sciences, Bharatidasan University, Tiruchirapalli.
- 11) Dr. Suganthi, Assistant professor, Department of Microbiology, University of Madras, Taramani, University of Madras.

8)Details of Lab Visit:

- 1) University of Madras, Microbiology, Medical Biochemistry and Biotechnology labs**
- 2) Sri Rama Chandra University Biotechnolgy Lab.**
- 3) IRL – Molecular Microbiology Lab, Puducherry**

9)Pre- Requisites for the course:

At the On Summer school Course (CMGL-2018) Students participate learn dozens of strategies for empowering students to become active, responsible learners. At this advanced On Course (CMGL-2018) participant not only add more than 100 student-empowerment strategies to their repertoire, they also learn the essential design and facilitation skills necessary for being an effective learner-centered educator who can empower students to move from superficial to deep learning. These advanced design and facilitation skills also provide the knowledge and resources for participants to help colleagues provide more effective educational experiences for their students. The skills presented in this workshop are drawn from best practices in academic curriculum design, brain research, active-learning principles, corporate training methodology, and personal development strategies. This workshop is ideal for educators who want to help students become active, responsible learners to take a leadership role in helping their college or university become more learner-centered! Attendees who participate in the entire On the Summer school programme Course (CMGL -2018) gain good Skills and Knowledge taught by professors provided by On Summer school programme-2018.

10)Reading List: Books:

- 1) Michael R. Green and Joseph Sambrook (2012) Molecular Cloning 4th Edition: A Laboratory Manual Michael R. Green and Joseph Sambrook, Cold spring Harbor Laboratory Press.
- 2) Andrew J.Linkand, JoshuaLaBaer (2009) Cell and Molecular Biology Proteomics: A Cold Spring Harbor Laboratory Course Manual.

Articles:

- 1) Journal of cloning and transgenesis
- 2) Journal of proteomics and Bioinformatics
- 3) Journal of proteome- Elsevier
- 4) Journal of molecular and Genetic medicine
- 5) Journal of Next generation sequencing and Applications
- 6) Journal of phylogenetics and Evolutionary Biology

- 7) Journal of clinical and medical Genomics
- 8) Annals of Genetics
- 9) Journal of carcinogenesis and mutagenesis
- 10) Journal of medical research and health education.

11) Cultural component:

Short description of the cultural elements included in the course : **Objectives and Teaching methods:**

Objectives:

- To familiarize the students with contemporary academic advancements with good themes from Research Journals and books.
- To motivate and train the students in practical handling of molecular and microbiological techniques.
- To train the students with skills in scientific writing.

Sustaining a Growth Mindset for Summer School Learning- (CMGL-2018)

The summer school programme (CMGL-2018) enrich and nourish the students with knowledge (PBL) problem based learning and also trains the students in reading the research journals and test the students ability in conducting exams. This highly engaging and interactive summer school programme will show teachers how to incorporate research-based fluency, practical Handling of microbiology, genetics and Molecular biology techniques Teachers will learn appropriate pre-Exam activities to ensure their students succeed in learning all strategies.

12) Duration of total hours of activities : 6.30 hrs/ Day