

KARYASHALA PROGRAM ACCELERATE VIGYAN

Hands-on Training and Workshop on High End Mass Spectrometry Based Lipidomics

For ongoing M. Sc & Ph. D scholars

Jointly organized by

DST -Science and Engineering
Research Board
&
CSIR-Central Food Technological
Research Institute

On January 16th -20th 2023



HIGH-END WORKSHOP FOR ASPIRING
RESEARCH STUDENTS

PURPOSE OF WORKSHOP

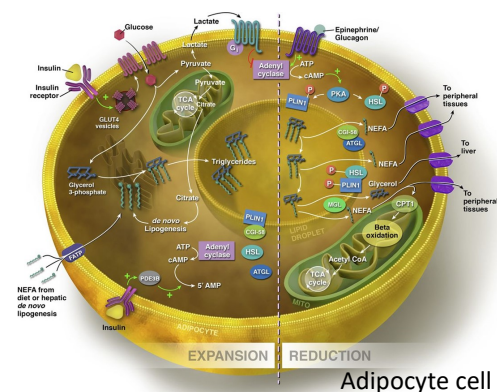
Lipidomics is a novel emerged discipline of metabolomics that elucidates the nature of lipids in foods and totality of lipid flux at cellular level using large scale based on mass spectrometry technological tools. The alteration in the cellular lipids and regulation of metabolic pathways in biomedical sciences is greatly advanced. These studies led for identifying new lipid signalling molecules and discovery of potential biomarkers for prognosis of diseases. On the other hand, these principles and use of advanced analytical techniques are an infancy in understanding nutritional lipidomics, foods and identification of nutraceuticals in food products. Unlike other metabolites, there are several thousand of lipid species to be identified and quantified due to structural diversity of class of lipids that have different acyl chain lengths and head groups. Understanding this structural diversity and its function as a lipidome is goal of the program that assist in correlation of lipid metabolism towards disease mechanisms. Complexity of lipid classes and its isomers led to a challenging task for its identification for a novice. A through hands on training on fundamental aspects of lipid biochemistry and lipidomic analysis is warranted.



ABOUT KARYASHALA

The Department of Food Safety and Analytical Quality Control Laboratory is conducting the karyashala a high-end workshop with “hands on training of mass spectrometry for understanding the lipidome and its implications towards health and diseases and foods.”

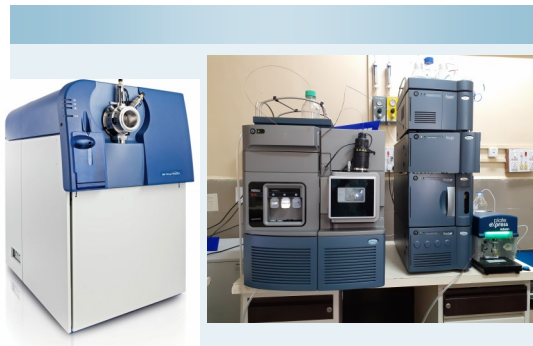
The advances on mass spectrometry led to crosslinking of metabolites with metabolic pathways and gave a new direction to biomedical research field. Lipidomics area is emerging in food sciences for development of nutraceuticals. A five-day workshop is aimed for explaining the fundamentals of lipidomics and hands on training on mass spectrometry.



For more details kindly visit <https://cftri.res.in/sdp>



ACCELERATE
VIGYAN



Focus Areas

- ◆ Lipidome analysis & nutraceuticals
- ◆ Simple to advanced techniques of lipid profiling
- ◆ Understanding on structural diversity of lipids and functional aspects of lipidomics data

Who shall apply

The program is designed for technical skill development in mass spectrometry for lipidomics area for PG and Ph. D Students enrolled in Indian University or Institution.

Maximum number of participants : 10 (M. Sc) +10 (Ph. D)

Duration : Five Days

No registration fees. *Travel & accommodation will be provided for the selected candidates.* Candidates have to submit the No Objection Certificate / Recommendation Letter from Head of the Department/Institution for attending the workshop in person. Also justification for attending the workshop to be submitted.

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Lecture Topics

Day 1

- ◆ LIPIDS in foods, health and diseases
- ◆ Lipid nutraceuticals and lipidomics overview
- ◆ Basics of chromatography
- ◆ Fundamentals of mass spectrometry

Day 2

- ◆ Advances in ionization techniques and NMR in lipidomics
- ◆ Principles of GC-MS and TLC for lipid profiling

Day 3

- ◆ Lipid metabolism and pathways
- ◆ Biochemical basis and quality control measures of lipid analysis

Day 4

- ◆ Fundamentals of targeted and short gun lipidomics
- ◆ Tools of lipidomics and basics of statistics
- ◆ Quality control measures for food, preclinical/clinical samples

Day 5

- ◆ A case study on elucidation of lipids
- ◆ Emerging advanced bioinformatics resources, techniques, and applications related to biomedical and food sciences

Hands on Practical Sessions

- ◆ Tips and tricks of sample preparation and handling of food and biological samples
- ◆ Thin layer chromatography
- ◆ Gas phase chromatography with flame ionization detector
- ◆ Gas phase chromatography with mass spectrometer
- ◆ Targeted lipidomics with ultra pressure liquid chromatography coupled with mass spectrometer
- ◆ Untargeted lipidomics with time of flight mass spectrometer
- ◆ Bioinformatic tools, LIPID MAPS
- ◆ Maintenance and troubleshooting of LC, GC coupled with mass spectrometer instruments



Chief Patron: Dr. Sridevi Annapurna Singh, Director, CSIR-CFTRI

Patron: Dr. A. Jayadeep, Head, Dept of Food Safety and Analytical Quality Control Laboratory, CSIR-CFTRI

Event Organizer: Dr. Dandamudi Usharani, Dept of FSAQCL, CSIR-CFTRI

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