CSIR Integrated Skill Initiative

Basic Training in Electron Microscopy techniques for Life Sciences
CSIR-CDRI

This training at a state-of-the-art facility aimed at enhancing the knowledge and skill-set of students, research fellows, faculty and staff working in the area of biological electron microscopy. It will help participants to plan future studies in cell biology and nanotechnology involving EM techniques. The focus would be on applications and their specimen preparation methods with intensive hands-on practical sessions. The course would also cover basic TEM/SEM operation and maintenance/troubleshooting issues. The course will improve job prospects of trainees as there is limited expertise available in India while there is a great demand for trained manpower in this area. Trained candidates will also have an edge while applying for positions in EM labs in various research institutes requiring practical experience in these techniques.

CSIR-CDRI invites applications for '**Basic Training in Electron Microscopy techniques for Life Sciences"**

as per the details given below:

Title of the Course	**:**	Basic Training in Electron Microscopy techniques for Life Sciences
Duration	:	**3** Weeks
No. of Seats	:	10
Educational Qualification	:	B.Sc./M.Sc./B.Tech/M.Tech/B.Pharm/M.Pharm/Ph.D./B.V.Sc,M.V.Sc; (Basic knowledge of optical microscopy is essential)
Age group	:	21-45 years
Date of commencement	:	**10.08.2020 to 31.08.2020**
Course Fee	:	Rs. 15,000

TRAINING CURRICULUM:

Electron Microscopy (TEM, SEM)

- How to work in the electron microscopy laboratory, safety procedures, maintenance of EMs and ancillary equipment, handling of toxic reagents
- Transmission Electron Microscopy (TEM): principles, magnification and resolution, aspects of image formation, components of TEM, physical basis of contrast; Applications of TEM in biology.
- Biological specimen preparation for TEM: Preparation of coated grids, Negative staining and Embedding techniques (adherent/suspension cells, tissues)
- Visualizing nanostructures; Characterization of viruses and virus like particles by TEM for optimization of vaccines and diagnostic virology
- Obtaining thin sections using ultramicrotomy, contrasting of thin sections
- Demonstration of TEM operation/handling, alignments, aberration corrections, and imaging; Visualizing and understanding cellular ultrastructure
- Scanning Electron Microscopy (SEM): principles of SEM, applications in biology and medicine, components of SEM
- Specimen preparation methods for SEM (powder specimens, adherent/suspension cells, tissues, etc.), critical point drying, sputter coating
- Demo of specimen preparation equipments like sputter coater, critical point dryer, high vacuum evaporator, ultramicrotome

- Characterization of drug formulations and nano delivery systems using EM
- Demonstration of SEM operation/handling, astigmatism correction, optimizing parameters for imaging depending on type of specimen and imaging
- Basic principles of CryoEM
- Discussion and troubleshooting

SALIENT FEATURES OF THE TRAINING

- About 25% Theory and 75% Practical hands-on sessions as per course curriculum
- Small batch size for effective training
- Understanding basic principles
- Lectures assisted with multimedia aids
- Interactive session
- Exposure to diverse sample preparation techniques
- Demonstrations of working of state-of-the-art equipments
- Planning experiments for obtaining meaningful results
- Troubleshooting

EVALUATION OF TRAINEES

Evaluation will consist of the following components

Theory Courses (50 Marks)

(a) Continuous assessment through assignments
(b) Term and examination

Practical Courses (50 Marks)

(a) Guided Experiments
(b) Unguided Experiments

CERTIFICATION

Certificate will be issued to the successful candidates for the course

For further information, please contact to:

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&
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