



Advanced course on Electron Microscopy

This course aims at generating trained human resources ready for employment in industry and academia. It will provide a unique opportunity for skill development and provide a basis for planning future studies in cell biology involving these techniques. The course will improve their job prospects as there is limited expertise available in India while there is a great demand for trained manpower in these areas. Trained candidates will also have an edge while applying for positions in cell biology labs in various research institutes requiring practical experience in these techniques. Candidates may find suitable positions such as Scientists, Technicians, Research assistants, etc in research/diagnostic laboratories and applications/marketing positions in various companies, etc. This training at state-of-the-art facilities will equip candidates to apply for these positions with the requisite theoretical and practical knowledge and experience.

Duration	:	6 Weeks
No of Seats	:	10
Essential Qualification	:	B.Sc./B.V.Sc./B.Tech/B.Pharm./M.Sc./M.Tech./M.Pharm./M.V.Sc./Ph.D.

Training Curriculum

- 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
- Basic 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
- Using various specimen preparation equipments like sputter coater, critical point dryer, high vacuum evaporator, ultramicrotome
- Characterization of drug formulations and nano delivery systems using EM
- Basic SEM operation/handling, astigmatism correction, optimizing parameters for imaging depending on type of specimen and imaging
- Basic principles of CryoEM
- Discussion and troubleshooting