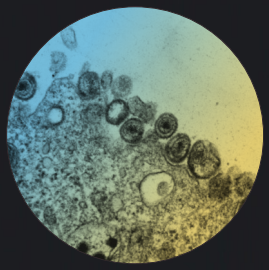

UAlg
UNIVERSIDADE DO ALGARVE

## PROGRAM IN A NUTSHELL

1. Introduction to electron microscopy: Basic principles and microscope types; Ultrastructure interpretation;
2. Transmission electron microscopy, TEM: Principles and applications;
3. Sample preparation for morphological study: Sample types; chemistry-morphology correlation; new methods;
4. Scanning electron microscopy, SEM: Principles, sample preparation and elemental analysis.

## PARTICIPANTS

Graduate students and researchers interested in the field of electron microscopy. No previous experience in the field is required.

## REGISTRATION

For information and payment go to www.ccmar.ualg.pt

# BIOMEDICAL AND BIOLOGICAL APPLICATIONS OF SCANNING AND TRANSMISSION ELECTRON MICROSCOPY

PROMMOTED BY

CCMAR

CIEGM CENTRO DE INVESTIGAÇÃO INTERDISCIPLINAR EGAS MONIZ

FUNCTIONAL BIOCHEMISTRY AND PROTEOMICS Research and Development

SPONSORS:

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21/25 SEPTEMBER 2015

## INTRODUCTION

Electron microscopy methods allow the visualization of nano (< 100nm) sized objects, that include in biological sciences, all the cellular ultrastructure, comprising molecular machines such as viruses, ribosomes etc.

This possibility, enabled by robust and reliable sample preparation methods, turn the Electron Microscope into a powerful and unique tool for the study of diverse biomedical problems.

The role of microscopy as "the eyes of the researcher" cannot be underestimated as demonstrated by the continued importance of old and new microscopy methods. Electron microscopy is an opened window to macromolecular structure, combining structural and molecular information, in a unique way.


**A.P. Alves de Matos**
**Biologist, Ph.D**

Executive director of the Centro de investigação interdisciplinar Egas Moniz (CiiEM)

Head of the Centro de Microscopia Electrónica Egas Moniz (Cmicros)

President-elect of the Society for Ultrastructural Pathology (SUP)


**21 SEP**

09:00 / Registration
09:30 / **Breaking the resolution limit of visible light**
**Basic principles of electron optics**
11:00 / Coffee break
11:30 / **Distinct electron microscopes and their evolution**
13:00 / Lunch
14:30 / **Sample types for ultrastructural examination**
16:00 / Coffee break
16:30 / **The interpretation of ultrastructure**

**22 SEP**

09:30 / **Transmission electron microscope**
**main principles of functioning**
11:00 / Coffee break
11:30 / **Sample preparation for TEM**
13:00 / Lunch
14:30 / **Applications: cells and tissues analysis**
16:00 / Coffee break
16:30 / **Applications: study of viruses and nanoparticles**

**23 SEP**

09:30 / **Scanning electron microscope**
**main principles of functioning**
11:00 / Coffee break
11:30 / **SEM: Sample preparation Examples**
**and applications**
13:00 / Lunch
14:30 / **Image interpretation in TEM and SEM**
16:00 / Coffee break
16:30 / **Chemistry-morphology correlation in TEM**
**Cytochemistry and immunocytochemistry**

**24 SEP**

09:30 / **SEM Elemental analysis and applications**
11:00 / Coffee break
11:30 / **New methodologies for tomography**
**and criomicroscopy**
13:00 / Lunch
14:30 / **Round Table**[1] (Room 2)
16:00 / Coffee break
16:30 / **Training laboratory**[2]**: Group 1** (Room 1)
**Exercises**[3]**: Groups 2 and 3** (Room 2)

**25 SEP**

09:30 / **Training laboratory: Group 2**[2] (Room 1)
**Exercises**[3]**: Groups 1 and 3** (Room 2)
11:00 / Coffee break
11:30 / **Training laboratory: Group 3**[2] (Room 1)
**Exercises**[3]**: Groups 1 and 2** (Room 2)
13:00 / Lunch
14:30 / **Round Table**[4] (Room 2)
16:00 / Coffee break
16:30 / **Examination**[5] (Room 2)

**1** Round-table discussion (Group 1+2+3).
**2** Practical session demonstration, using the TM 3030 Plus Microscope, Hitachi. Sessions will be restricted to max 5 trainees.
**3** Exercises for image interpretation
**4** Round-table final discussion (Group 1+2+3).
**5** The exam is optional for accreditation of 3 ECTS