Electron microscopy – a focus on 3D techniques

SS 2024

General Informations

- The majority of the lecture slides can be found on our homepage: www.plantdevelopment.bio.lmu.de → teaching → materials & exams
- If I have to use a password for pdf-slides: **SS2024**
- Practical applications and visual aids in course of the lecture
- Exam: **July 15th, 2024**, 12:30 – 13:30
- Re-take exam: **July 29th, 2024**, 12:30 – 13:30
- If there will be a room change for the exam, I will announce it early enough
- Registration for exam (deadline: **July 8th, 2024**) and re-take exam (deadline: **July 22nd, 2024**) is mandatory: a.klingl@lmu.de

Literature

- L. Reimer. Transmission electron microscopy. Springer ISBN 3-540-50499-0
- D.B. Williams, C.B. Carter (1996). Transmission electron microscopy. Plenum Press, New York. ISBN 0-306-45324-X
- Ayache J., Beaunier L., Boumendil J., Ehret G., Laub D. (2010). Sample Preparation Handbook for Transmission Electron Microscopy. Springer Verlag
- Hayat M.A. (1989). Principles and techniques of Electron Microscopy: Biological applications. CRC Press
- Wischnitzer S. (1970). Introduction to Electron Microscopy. Pergamon Press
- Egerton R.F. (2010). Physical Principles of Electron Microscopy. Springer Verlag
- Wanner G. (2022). A practical guide to scanning electron microscopy in the biosciences. Wiley-VCH. ISBN 978-3-527-35049-0

FAQs

- Expectations or: What is included in Advanced Electron Microscopy?
- What do I need for these advanced techniques? Material, equipment, samples,...
- Any advances in recent years? cryo-TEM, STEM, cryo-SEM, ESEM, FIB/SEM, SBF-SEM
- What kind of limitations do I have in the respective technique?

General overview of the lecture

1. General introduction with repetition of basic requirements for high-resolution electron microscopy: vacuum, cathodes, data acquisition, sample preparation (cryo!?)
2. Introduction of scanning electron microscopy (SEM)
3. Advanced electron microscopy: TEM-tomography, STEM, ESEM, FIB/SEM, SBF-SEM
4. Advanced applications: EELS, EDX, single particle analysis, electron tomography, etc.

Don´t panic![1]

Whenever you have questions, just ask!

[1]The Hitchhiker`s Guide to the Galaxy, Douglas Adams