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Microscopy in biomedical research

The history of microscopy

- Why we need microscopes? What problems we try to solve?
- The development of microscopy techniques
 - Important people
 - Principles and limitations
- How it changes the way we study biology

Recent examples of using microscopy methods to study molecular and cell biology

- Protein-protein interaction and protein trafficking
- Single-molecule localization
- Cell Morphogenesis and migration
- Neural circuits and function

Future of microscopy?

- What are we still longing for?
- Microscopy methods that are under development

The microscopy methods that will be covered in this lecture are:

- Regular light microscopy

- Phase contrast and Dark field
- Polarization
- Differential interference contrast
- Fluorescence

- Laser-based microscopy

- Confocal
- Two-photon
- Light-sheet

- Super-resolution fluorescence microscopy

- PALM
- STED