# Introduction to the Bioimaging Centre

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## Light Microscopy

### Wide Field Microscopes
- **Zeiss Axiophot**  
- **Olympus IX81**

#### Main Features
- Mercury arc lamp
- 10-100x objectives
- Filter sets: DAPI/blue/yellow/green/red
- GFP/RFP Dual cube
- Cool snap HQ2 CCD b/w camera
- TIRF System
- 488nm 561nm 50mW solid state lasers
- 405nm 100mW Blue diode
- Inverted microscope
- Resolution 200nm
- D-VisiFRAP Realtime Scanner

#### Applications
- Detection of faint signals
- Use of 2 different colour probes at once
- 100ms frame rate
- Time lapse imaging
- Single molecule assays in TIRF
- 3D Reconstruction
- FRAP / Photo activation

### Confocal Laser Scanning Microscopes
- **Leica TCS SP8**  
- **Zeiss LSM 510**  
- **Nikon A1**

#### Main Features
- Lasers: Diode 405 30mW 405nm
- Argon/2 30mW 458,477,488,514nm
- He Ne 1.2mW 543nm
- He Ne 5.0mW 633nm
- Objectives: 10x – 100x, plus optical zoom
- Adjustable Pinhole
- Environmental chamber

#### Applications
- Life cell imaging
- Permits optical sectioning of sample
- Localisation of your particle of interest withing a cell
- Use of 3 or 4 different colour probes at once
- Co-localisation of different particles
- FRET, FRAP and other specialised bleaching techniques
- 3D Reconstruction
- Emission fingerprinting

### Spinning Disc Confocal Microscope
- **Olympus IX81**

#### Main Features
- Lasers: Blue diode 405nm
- Solid State Lasers: 488nm
- Objectives: 10x – 100x
- Environmental chamber
- 2D-VisiFRAP Realtime Scanner
- CSU-X1 Spinning Disc unit (Yokogawa)
- Eppendorf micro injector

#### Applications
- Life cell imaging
- Time series capture
- Permits optical sectioning of sample
- Localisation of your particle of interest within a cell
- Co-localisation of different particles
- FRAP and other specialised bleaching techniques
- 3D Reconstruction
- Injection of antibodies, dyes, drugs or siRNA into single cells

## Electron Microscopy

### Jeol Jem 1400 Transmission Electron Microscope

#### Main Features
- Acc. voltage 40,60,80,100,120kV
- Resolution: 0.38nm
- Motorized Goniometer
- Range of specimen holders including High Tilt +/- 70°
- Gatan ES100w CCD camera
- Gatan Tomography Software

#### Applications
- Cell Ultrastructure
- Immunogold labelling
- Negative staining
- Tomography
- Nano particles
- Jet Propane/Freeze Substitution

### Jeol JSM 6390LV Scanning Electron Microscope

#### Main Features
- Acc. voltage 0.5-30kV
- Detectors: SEI (Secondary electrons) resolution 3.0mm
- BSE (Backscattered electrons) resolution 4.0mm
- LV mode (Low Vacuum)
- Gatan Alto 2100 Cryo-Preparation

#### Applications
- SEI: Topographical observation of surface
- BSE: Compositional observation of surface
- LV: Observing non-conducting specimen without metal coating
- Cryo-observation: Freeze fixation, ability of fracturing frozen specimens allowing internal surfaces to be scanned.

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