

## High resolution (cryo-) TEM

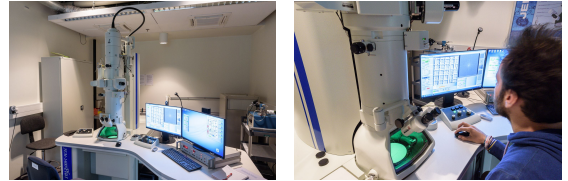
<https://labfacilities.wur.nl/SearchDetail.aspx?deviceid=b4f2d6a4-7e62-412b-952c-81279582ac32>

### **Brand**

JEOL

### **Type**

1400Plus



### **Contact**

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### **Organisation**

Plant Sciences Group

### **Department**

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### **Description**

Transmission Electron Microscopy has many applications across a multitude of industry sectors. It allows 2D and 3D-imaging of the internal structure of a wide range of samples, providing morphologic and crystallographic information. It thereby enables the analysis of structure and texture at micrometer and nanometer scale. The cryo-setup enables to image wet samples with this technology. As a result, the TEM platform of Wageningen University & Research, Shared Research Facilities is a powerful and flexible tool for studying a very broad range of materials and products. The JEOL JEM-1400Plus Transmission Electron Microscope offers ultimate in 120kV performance for a wide range of applications. The JEM-1400Plus features high resolution/high contrast imaging, outstanding TEM analytical performance. This system is extremely user-friendly as it has a wide range of automated functions including Auto Focus, Auto Exposure, and Auto Montage.

### **Technical Details**

JEOL 1400Plus Transmission electron microscope

- Versatile TEM for a wide range of applications
  - JEOL CCD camera Ruby (8 M pixel)
  - Software: SightX Viewer (JEOL) // Serial EM // Shotmeister
  - High Voltage: 80 kV, 120 kV
  - Emitter: LaB6 crystal
  - Tomography
  - Minimum magnification of 10x allows for full coverage of a specimen grid
- Holders
- Specimen quick change single tilt holder (Tilt-  $\pm 20^\circ$ )
  - 4-position multi-specimen holder
  - High tilt specimen holder (Tilt from + to -  $70^\circ$ )
  - GATAN liquid nitrogen cooled cryo-holder

## ***Applications***

Transmission Electron Microscopy can be used in wide range of research fields from biological to material research, life sciences, food technology, nanotechnology, medical sciences, forensic analysis.

The sample investigated can be:

1. An ultrathin section of material (50-70nm). For example

- from biological samples (to investigated ultrastructure of the cells and tissues, immunolocalisation)
- food samples (looking at membrane structure, lipids)
- microparticles (shell thickness, drug delivery)

2. a suspension of the material. For materials that have dimensions small enough to be partly electron transparent such as:

- powdered substances
- virus particles
- small organisms (e.g. bacteria)
- nanoparticles
- crystals

## ***Complementary Techniques***

### CRYO-TEM

The machine accommodates measurements under cryogenic temperatures, using the available cryo-holder and sample preparation equipment for imaging thin biological and other aqueous samples. The available software and fast Ruby CCD camera facilitates low dose cryo- measurements.

### Tomography

Tomography data collection program SerialEM can be used to automate acquisition of tilt-series. These EM tilt series can be reconstructed into (3D) tomograms and modeling the 3D data.

Ultra-wide area montage system, Limitless Panorama (LLP)

As the 1400plus combines electromagnetic image shift with stage drive, the system allows for simple capture of a montage panorama image over a limitless wide area. Thus, an ultra-wide area, high pixel-resolution image is obtainable.