From Eye to Insight

Leica
MICROSYSTEMS

Get Quality Serial Sections for Array Tomography Fast

ARTOS 3D Ultramicrotome

AUTOMATIC CREATION OF QUALITY SERIAL SECTIONS

Get consistent, ultrathin serial sections for array tomography in less time with the ARTOS 3D ultramicrotome.

The ARTOS 3D (ARray TOmography Solution) automatically creates and collects hundreds of serial-section ribbons all ready for array tomography with your scanning electron microscope (SEM). Save time and effort in biological sample preparation and SEM setup procedure so you can quickly get the images you need to answer critical research questions.

The innovative advanced touchscreen control unit enables programming the sectioning process to produce serial section ribbons automatically.

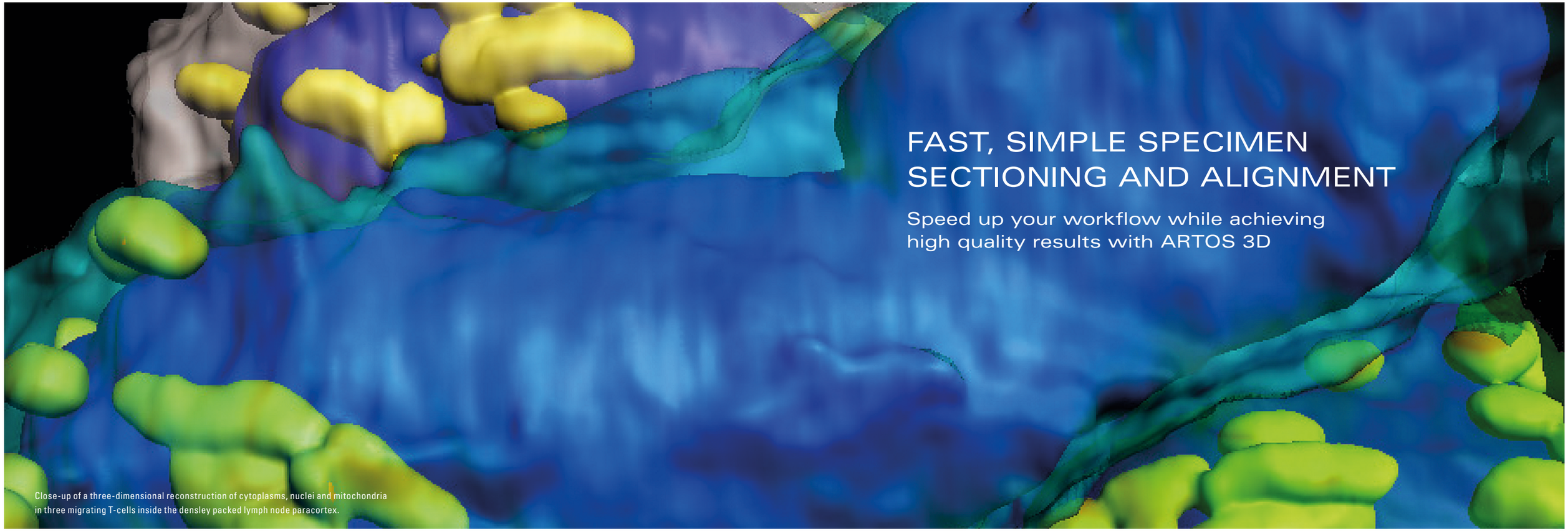
Pre-program the ARTOS 3D to produce automatically hundreds of ultrathin section ribbons with flexible block-face sizes.

Spend less time preparing sections with the automated serial sectioning of the ARTOS 3D. The custom-designed diamond knife enables a seamless transition from one wrinkle-free ribbon to the next with no thickness variation.

Avoid tricky, time-consuming manual ribbon collection with the ARTOS 3D integrated collection of fully aligned ribbons.

Fast setup for serial sectioning is possible with the ARTOS 3D using user-pre-defined programs. A smooth transfer from sectioning to imaging is achieved with a small section carrier used throughout the entire workflow.

Save SEM setup time by loading several carriers with high section density simultaneously. Smoothly transfer the section carrier through the whole specimen preparation process for a streamlined workflow.



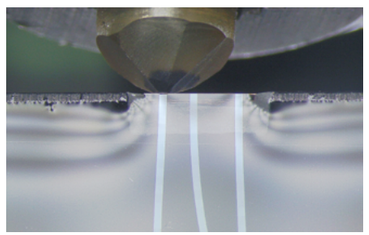
Close-up of a three-dimensional reconstruction of cytoplasms, nuclei and mitochondria in three migrating T-cells inside the densley packed lymph node paracortex.

FAST, SIMPLE SPECIMEN SECTIONING AND ALIGNMENT

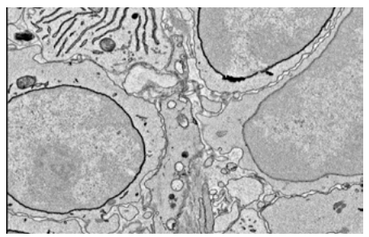
Speed up your workflow while achieving high quality results with ARTOS 3D

For optimal 3D reconstructions with array tomography (AT), ultrathin, ordered sections are a pre-requisite. With conventional ultramicrotomes this involves several time-consuming and cumbersome manual steps. The ARTOS 3D solution speeds up the process by automating specimen sectioning and minimizing the time required to align the sections for SEM imaging. The ARTOS 3D:

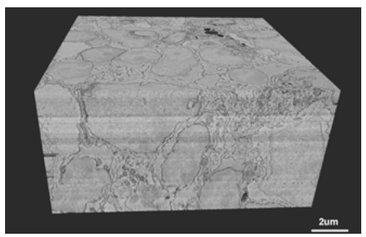
- Enables fast setup with programs pre-defined by the user for different section carriers
- Automatically creats and collects hundreds of ultrathin (> 20 nm) serial sections with minimal user intervention
- Sorts and positions ribbons wrinkle-free on the section carrier ready for SEM imaging
- Eliminates repetitive, time-consuming, and fiddly manual sorting and positioning of ribbons
- Uses the same small section carrier through the entire workflow for smooth transfer from sectioning to imaging
- As transparent section carriers are available, the ARTOS 3D is also an ideal solution for correlative light and electron microscopy (CLEM)



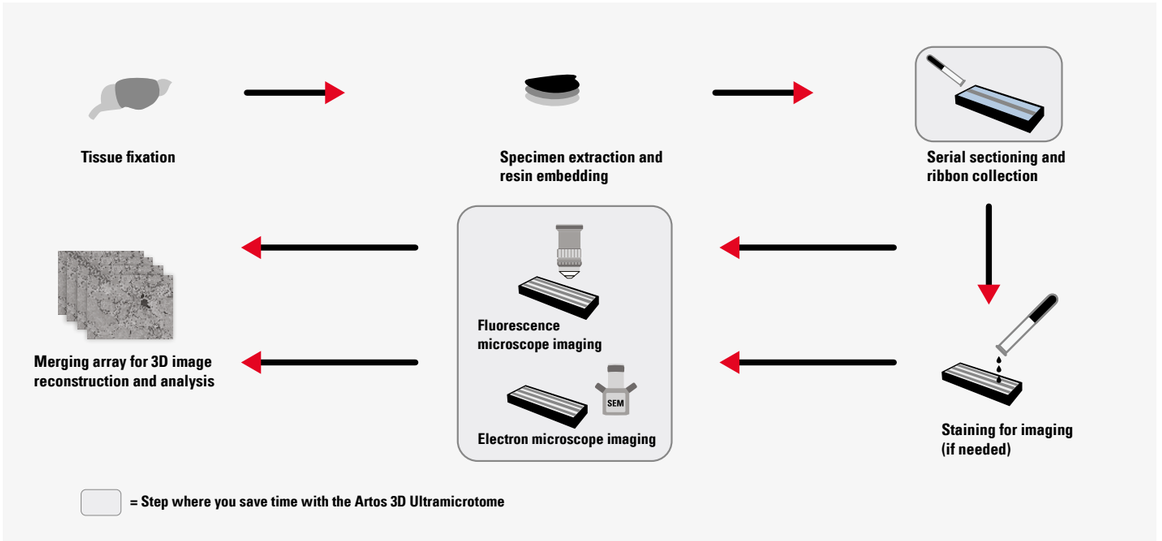
Automated, wrinkle-free ribbon collection with no thickness variation.



SEM image of one section from a series of 140 sections prepared with the ARTOS 3D collected onto a Si-wafer for 3D reconstruction. Courtesy of IST Austria.

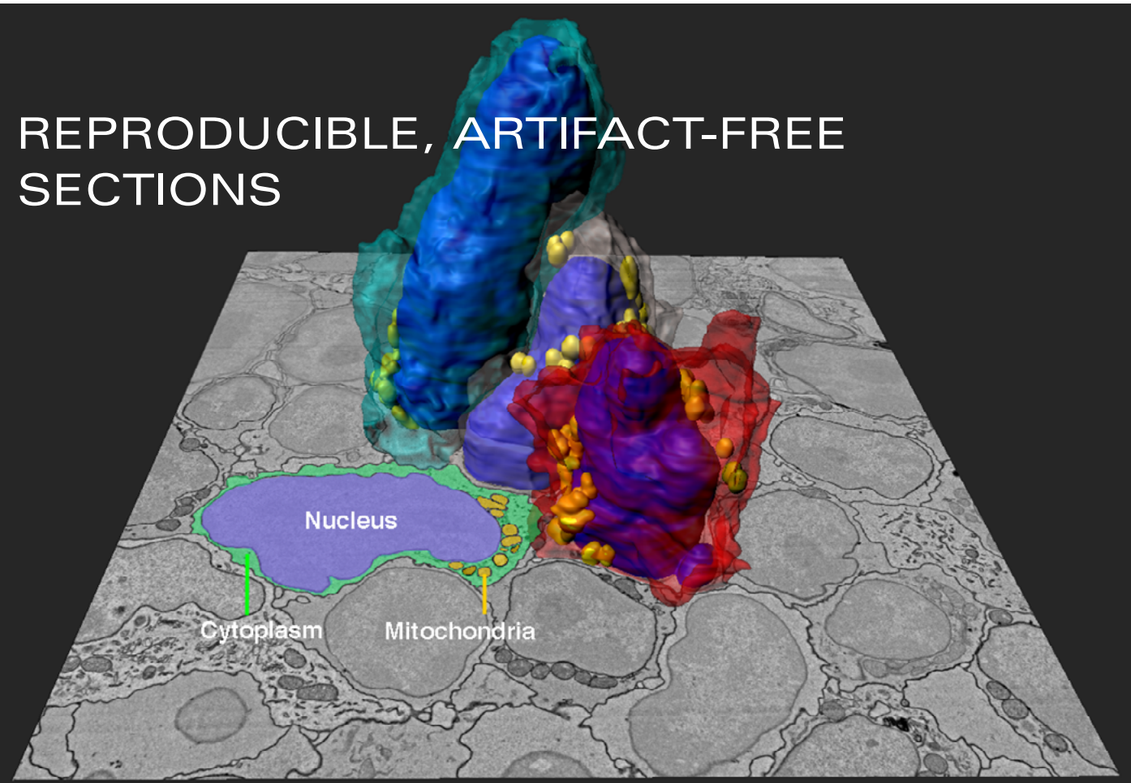


Three-dimensional view of the acquired scanning electron micrograph stack of the paracortex of a popliteal lymph node.

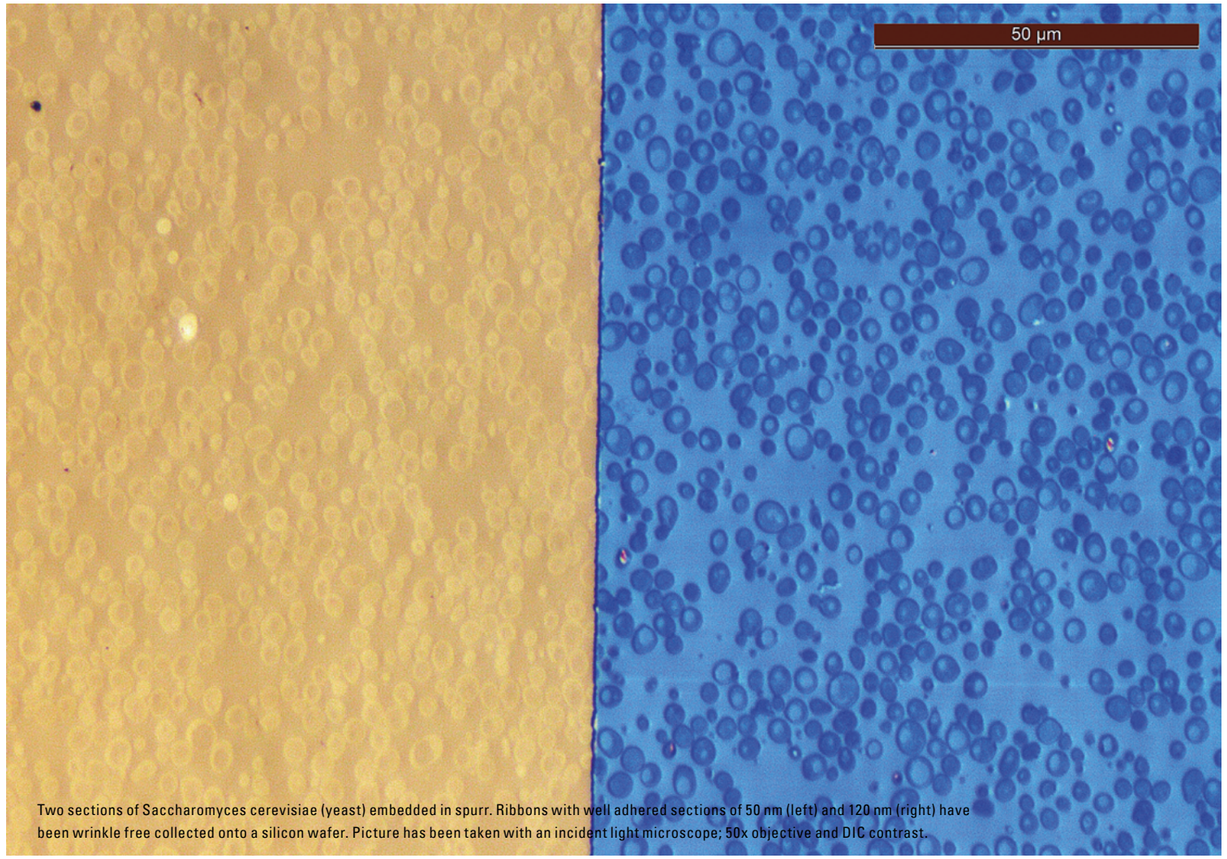


Speed up your workflow due to automated serial section and ribbon collection and minimize the time for aligning the sections for SEM.

REPRODUCIBLE, ARTIFACT-FREE SECTIONS



Three-dimensional reconstruction of three migrating T-cells inside the densely packed lymph node paracortex.
3D images courtesy: Frank Assen, Ludek Lovicar, Vanessa Zheden, and Michael Sixt, IST Austria, Klosterneuburg.



Two sections of Saccharomyces cerevisiae (yeast) embedded in spurr. Ribbons with well adhered sections of 50 nm (left) and 120 nm (right) have been wrinkle free collected onto a silicon wafer. Picture has been taken with an incident light microscope; 50x objective and DIC contrast.

Consistently high quality sections

The ARTOS 3D ultramicrotome is able to deliver reproducible, high quality sections rapidly by:

- Avoiding the artifact-causing conditions of manual sectioning and manipulation due to integrated direct section-ribbon collection
- Collecting ultrathin section ribbons without wrinkling by easily adjusting the water flow with the front valve
- Minimizing variation in section thickness by eliminating air turbulence and vibration thanks to a specially-designed draft shield and active damping plate
- Sectioning ribbons precisely and with consistent thickness, due to the custom-designed 4 mm diamond knife, adaptable to different section carriers

Avoid ribbon wrinkling by simply adjusting the ARTOS 3D front valve to control the water flow rate. More consistent section thickness is also attained with the ARTOS 3D draft shield and active damping system.

Based on trusted EM UC7 technology

The high performance and speed of the ARTOS 3D is based on the technology of the EM UC7 and can therefore be used for a full range of sample preparation tasks.

- Prepare excellent quality semi- and ultra-thin sections, as well as perfectly smooth surfaces required for LM, TEM, SEM and AFM examination due to the EM UC7's eucentric movement of the viewing system, motorized E-W and N-S movement of the knife stage, and automatic approach of the selceted knife segment
- Walk away form the instrument during trimming; the combination of the fully motorized knife stage and AutroTrim function completes and then stops the trim automatically
- The additional Spot-light illumination and the three independent brightness-controlled LED light sources provide for enhanced optical performance of the ultramicrotome
- Upgrade your EM UC7 ultramicrotome to an ARTOS 3D ultramicrotome
- Transform the EM UC7 and the ARTOS 3D ultramicrotomes into cryo-ultramicrotomes with the EM FC7 cryochamber in minutes

ARTOS 3D ultramicrotome equipped with the EM FC7 cryochamber.

CONNECT
WITH US!

Leica Mikrosysteme GmbH | Hernalser Hauptstrasse 219 | A-1170 Wien (Austria)
Tel. +43 1 486 8050-0 | F +43 1 486 8050-30
www.leica-microsystems.com