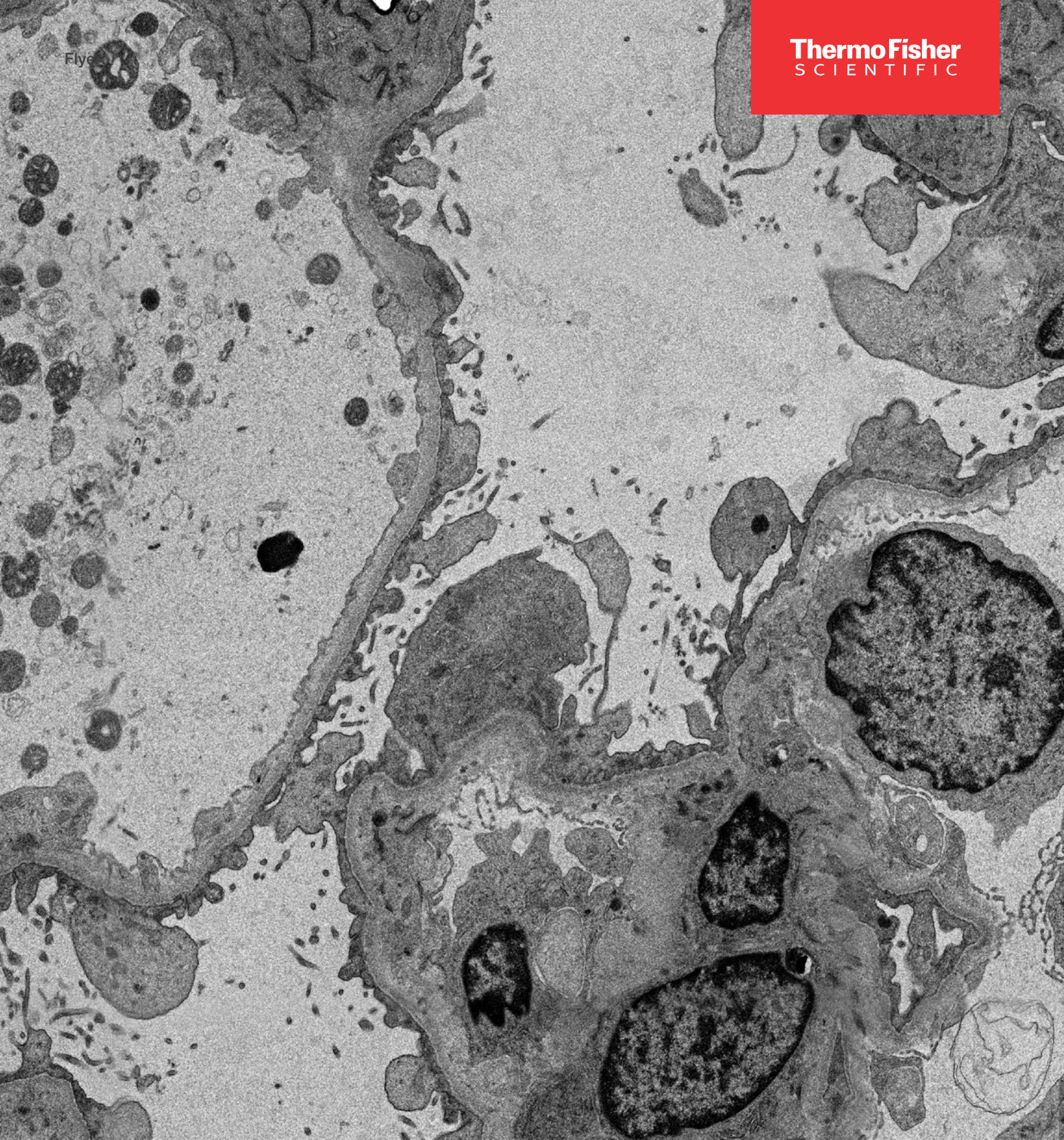


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Transmission electron microscopy in pathology

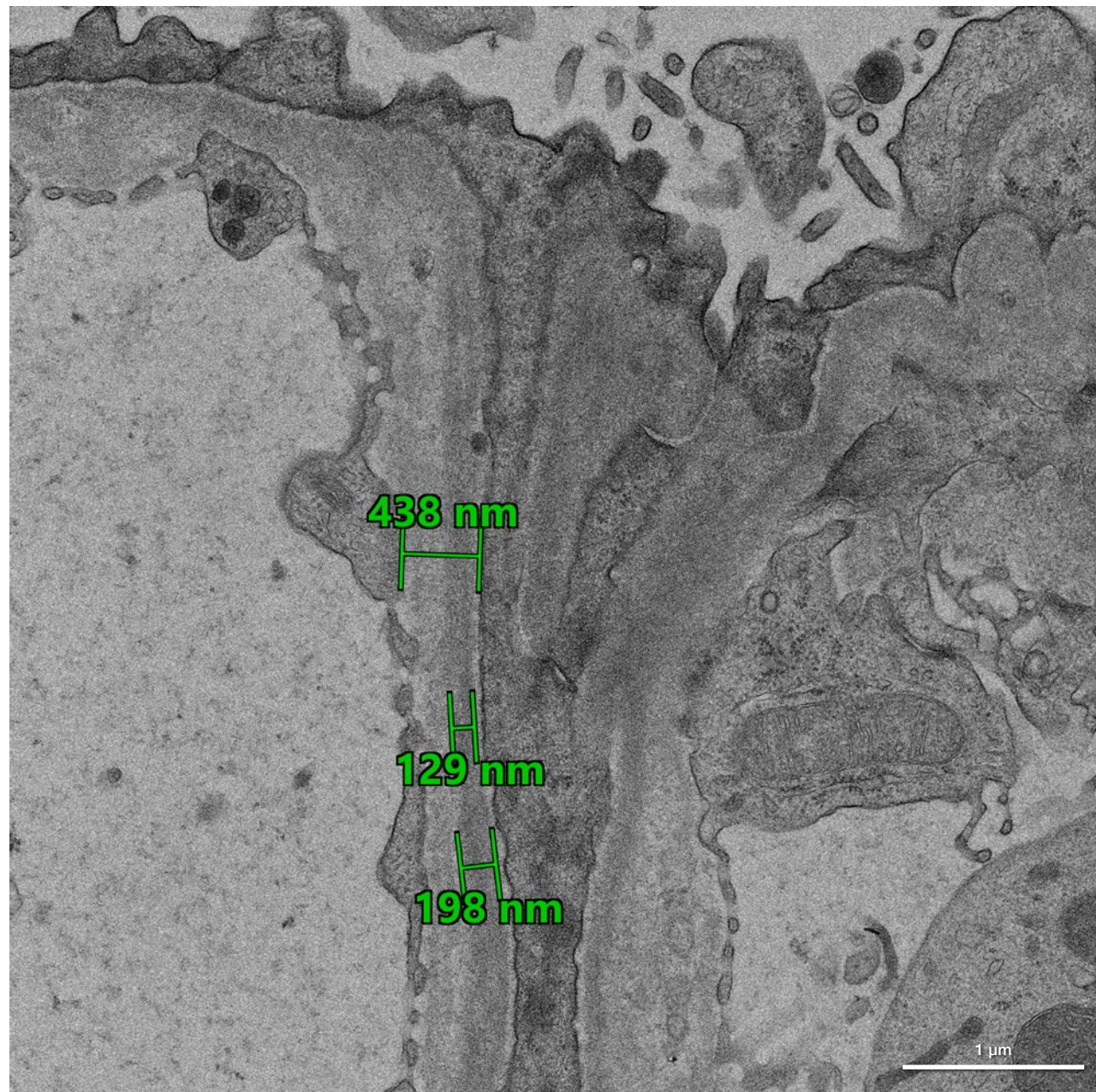
Straightforward, automated imaging of cells, tissues, and pathogens

thermoscientific

Pathology imaging with high-resolution transmission electron microscopy

Transmission electron microscopes (TEMs) provide crisp, high-contrast imaging that helps pathologists understand cell and tissue abnormalities at high resolution.

Accurate measurements of membranes, cellular organelles, and pathogens with TEM can be critical for understanding the tissue pathologies resulting from cell and organ dysfunctions, viral and microorganism infections, and cancer.



Measurement of glomerular basement membrane (GBM) in a kidney tissue sample. Image courtesy of the Department of Renal Pathology, Brigham and Women's Hospital, USA.

Talos 12 TEM for pathology imaging

The Thermo Scientific™ Talos™ 12 TEM reduces time to results through streamlined pathology workflows that can adapt to multi-user environments. Newer users can easily collect data while advanced users have access to more sophisticated controls.

Proven performance

The Talos 12 TEM is the next step in the popular Talos product family, designed with a robust enclosure to deliver high stability. A widened sample loading area and transfer deck can hold tools and holder loading stations.

LEDs convey system status through color and motion while providing a working light for sample exchanges in dark rooms. Light animations also direct users to insert holders properly and alert them to system issues.

Effortless remote operation and powerful system management for flexible collaboration

Offline data viewing and collaboration, with integrated data annotation and storage, allows multiple team members to work together and analyze data simultaneously.

Reduced footprint

With a reduced physical footprint (compared to previous Talos generations), the Talos 12 TEM is now suitable for a wider range of core labs and imaging facilities.

The Ceta family of CMOS cameras

The Thermo Scientific Ceta™ Cameras deliver large dynamic ranges and fast speeds. The camera is fully integrated and embedded into the design of the Talos 12 TEM, providing stability alongside optimized detector performance. These cameras offer a sensitive and robust fiber-optic-coupled scintillator as well as a large field of view and high speed.

This provides the speed and high-contrast visualization necessary to quickly scan and find regions of interest.



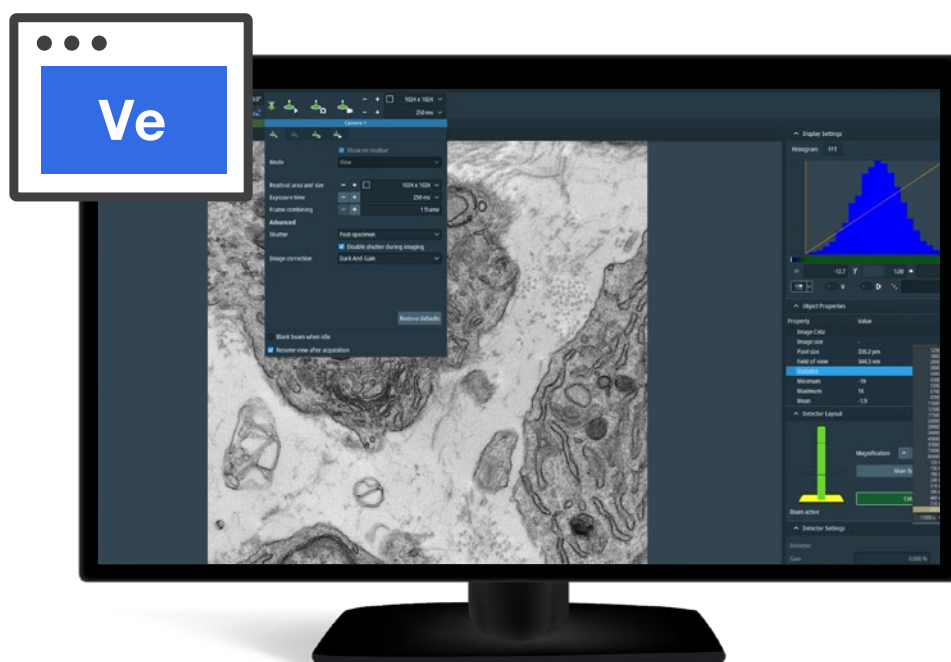
Ceta CMOS Camera



Easy onboarding and improved time-to-results

The complexity of legacy transmission electron microscopes can contribute to high operational and maintenance costs along with intensive onboarding for new users.

The Talos 12 TEM is equipped with Thermo Scientific™ Velox™ Software, a workflow-based user interface ideal for both novice and expert users, which helps reduce the TEM learning curve while increasing reproducibility and shortening time to results.



Reduced learning curve

Velox Software offers a mode-dependent user interface with graphical layouts that make the software easier to learn and more intuitive.



High reproducibility

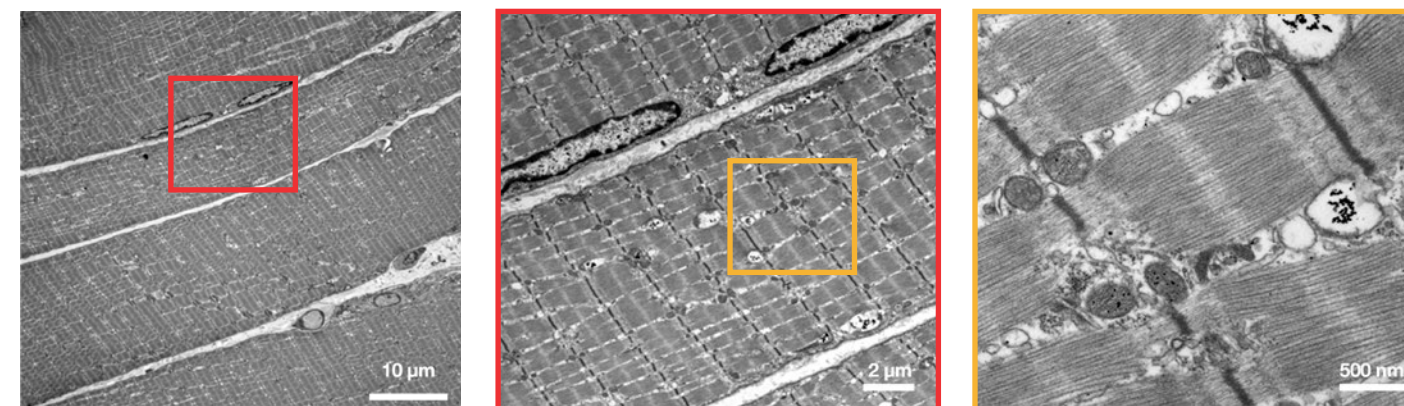
Combined comprehensive access to microscope optics and detectors provides superior experimental control for high reproducibility.



Improved time to results

Integrated auto functions ease the learning curve for novice operators and improve time-to-data for experienced users.

Effortlessly find and capture regions of interest

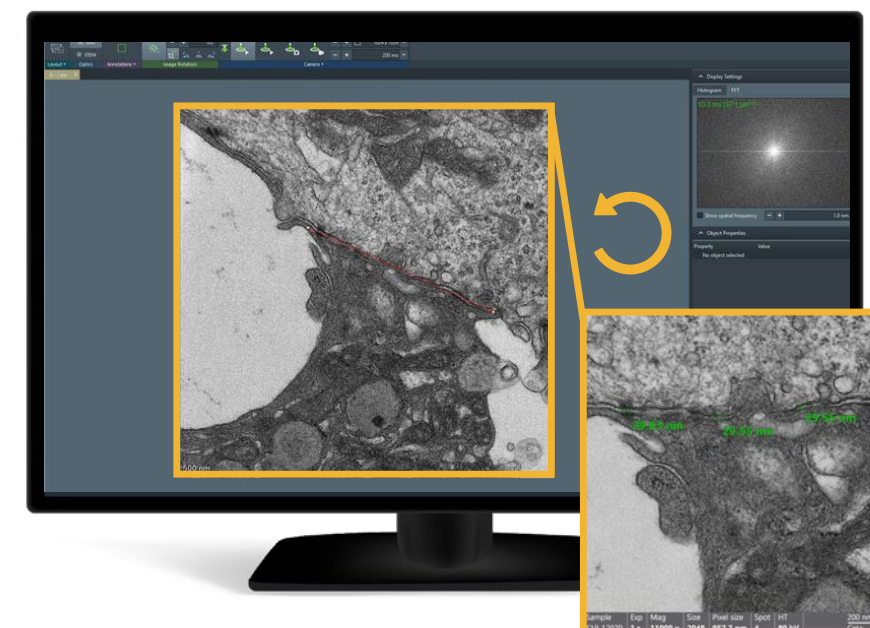


TEM image of resin-embedded muscle tissue at different magnifications. Velox Software enables easy magnification adjustments to capture regions of interest. Left) A region of interest is indicated within a TEM image. Center) A close up of this region is shown with an even smaller region of interest marked off. Right) Close up of the region of interest that was indicated in the previous image (center).

Image rotation for convenient measurements

Velox Software enhances sample visualization by allowing the image to be rotated without removing the specimen from the microscope. It also enables automatic stage direction adjustments while keeping all raw data.

An overlay function can be used to create multiple distance measurements and annotations, which can be saved and exported for review or sharing.



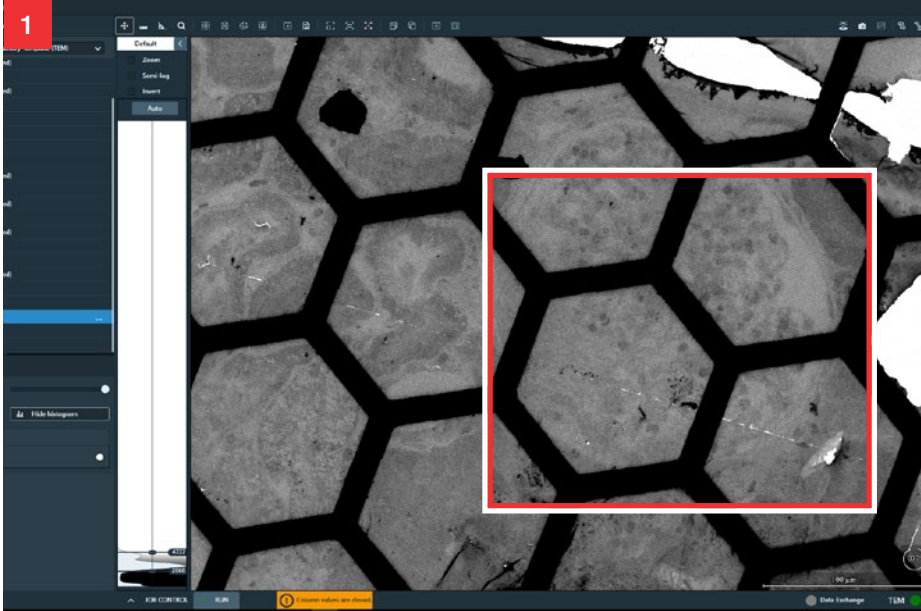
Example electron microscopy workflow in renal pathology

Examination of a glomerular basement membrane

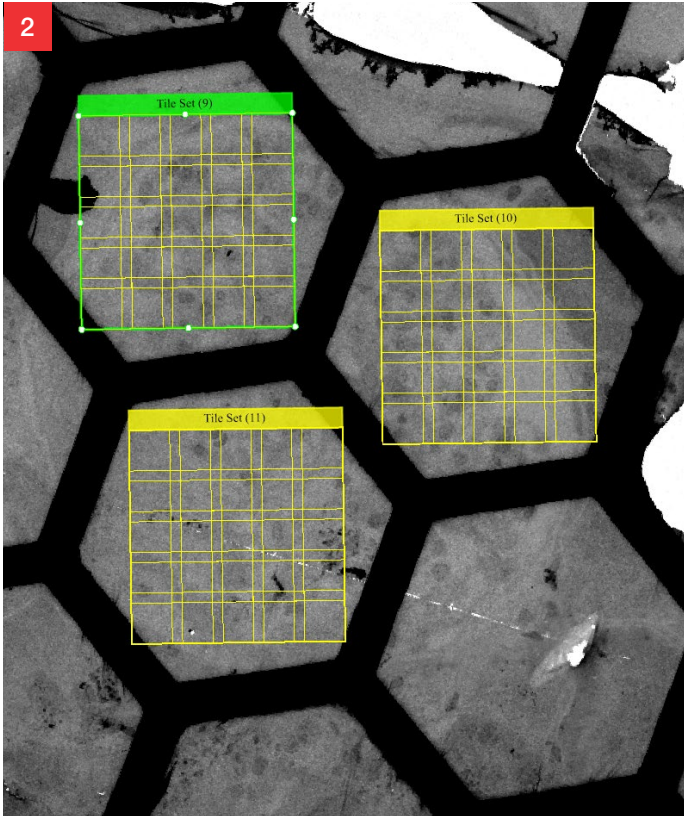
Improved productivity with automated data collection

Thermo Scientific Maps 3 Software is an add-on for the Talos 12 TEM that facilitates automated data collection for large area imaging. Navigate and scan large tissue section overviews, find regions of interest, and set-up automated

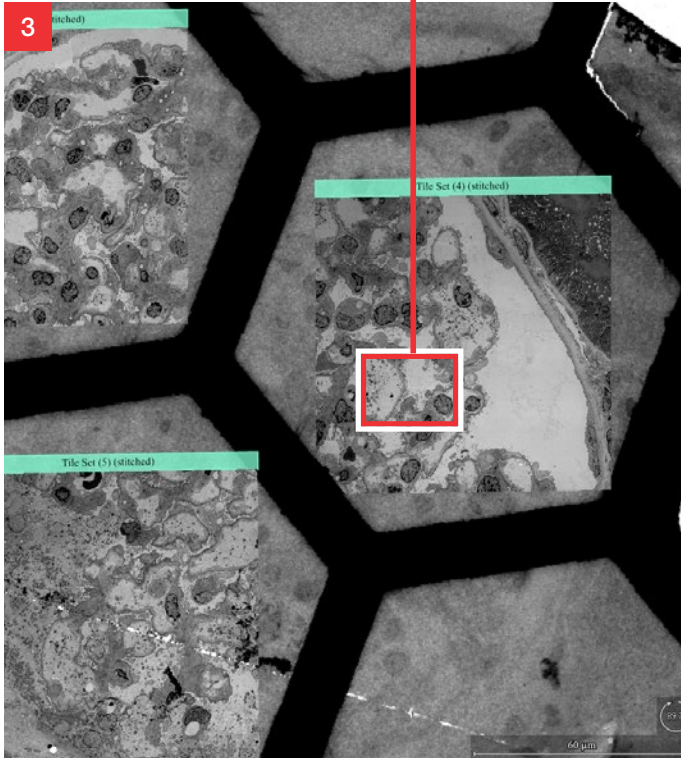
multi-scale image acquisitions for unsupervised, high-resolution analysis of targeted areas. Increase productivity by multi-tasking during image collection or through the use of unattended and extended data-acquisition sessions.



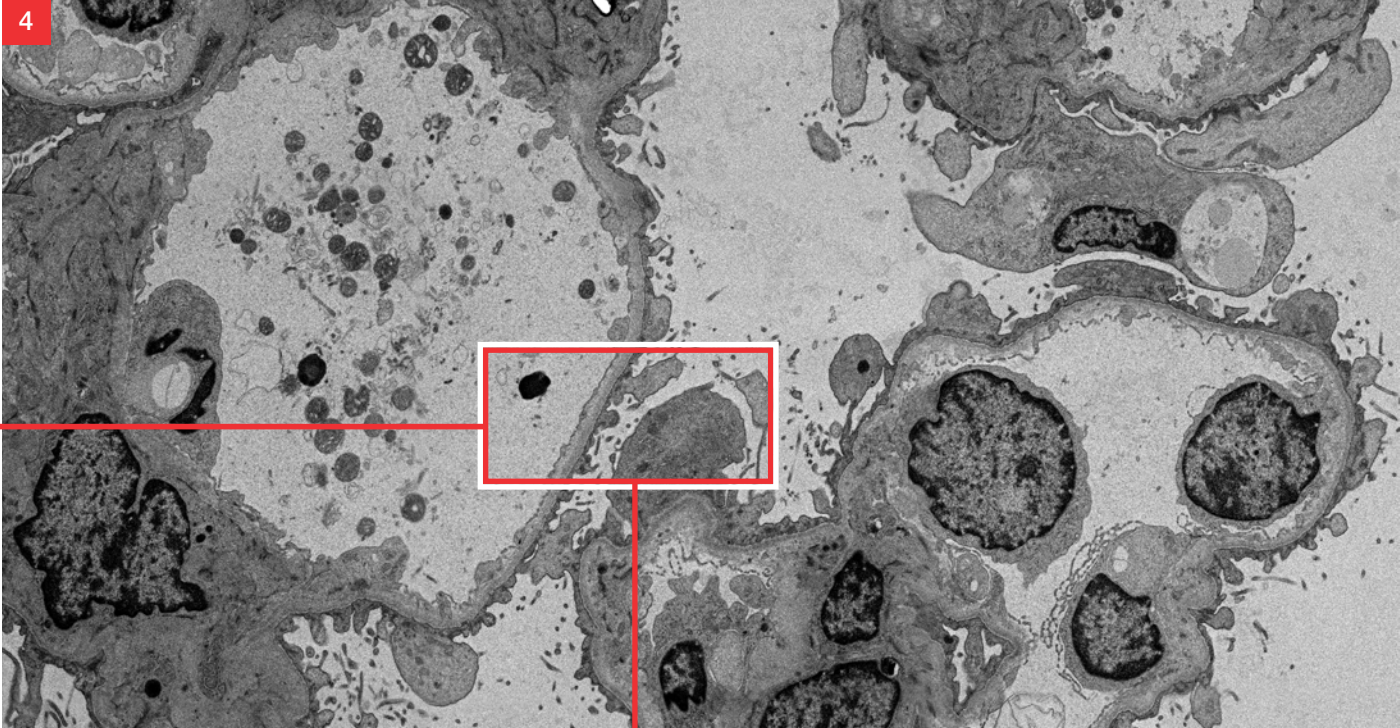
Identify area to be imaged in high resolution.



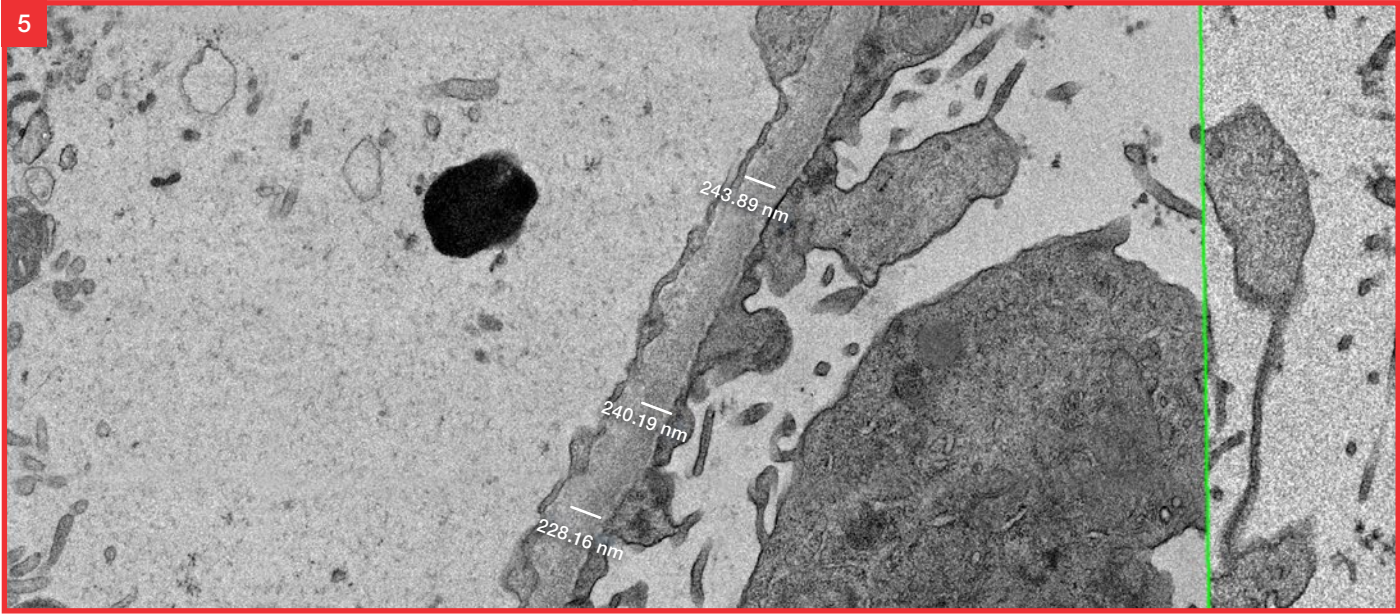
Set up batch acquisition of tiles that encompasses the target area.



Data is automatically collected and stitched into seamless images.



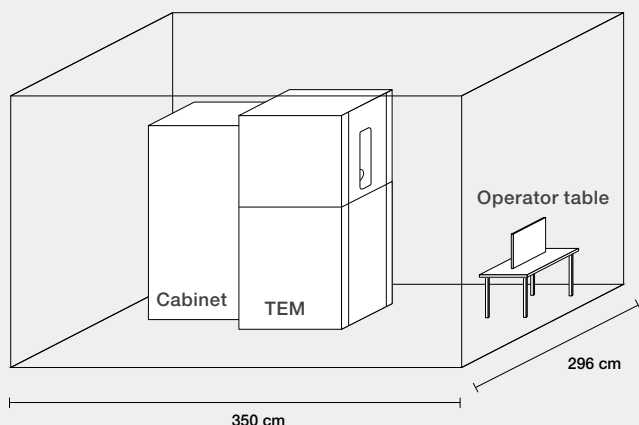
Digital zoom into area of interest.



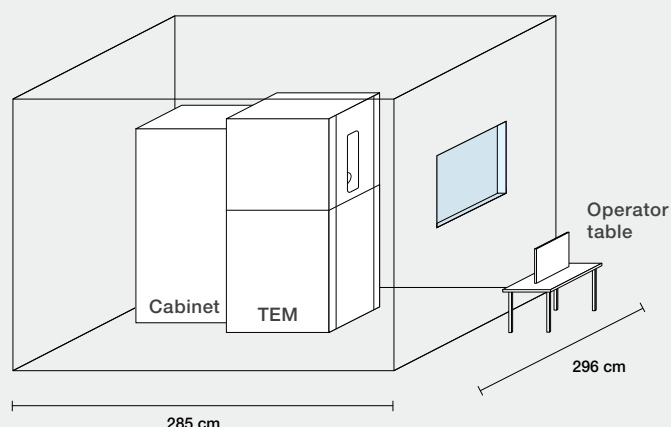
Add measurements and annotations. Collaborate with team members and analyze data simultaneously.

Maps 3 Software improves productivity by streamlining automated data collection of large areas. In this example, the GBM in a kidney tissue sample is examined with the Talos TEM and Maps 3 Software. 1) An area to be imaged at high resolution is first identified. 2) A batch acquisition of tiles is then set up to encompass the target area (glomerulus). 3) Data is then automatically collected and stitched into seamless images. 4) Overview of the resulting stitched tile set. 5) Digital zoom into an area of interest. 6) Measurements and annotations can be added once data collection is completed; this can be done in collaboration with remote team members, and the data can be analyzed simultaneously. Image data courtesy of the Renal Pathology Department, Brigham and Women's Hospital, USA.

Talos 12 TEM room requirements



Room configuration option A
 $10.4 \text{ m}^2 = 3.5 \times 2.96 \text{ m}$



Room configuration option B
 $8.4 \text{ m}^2 = 2.85 \times 2.96 \text{ m}$

Installation requirements

- Environmental temperature: 18–23°C
- Temperature stability: 1°C per 24 hours
- Relative humidity: <80%
- Room dimensions (see illustration to the left):
 - Room configuration option A: 3.5 x 2.96 m (11.48 x 9.71 ft)
 - Room configuration option B: 2.85 x 2.96 m (9.35 x 9.71 ft)
- Room height: 2.6 m (8.53 ft)

See the pre-installation manual for detailed information and possible room layouts.

Learn more at thermofisher.com/talos12

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