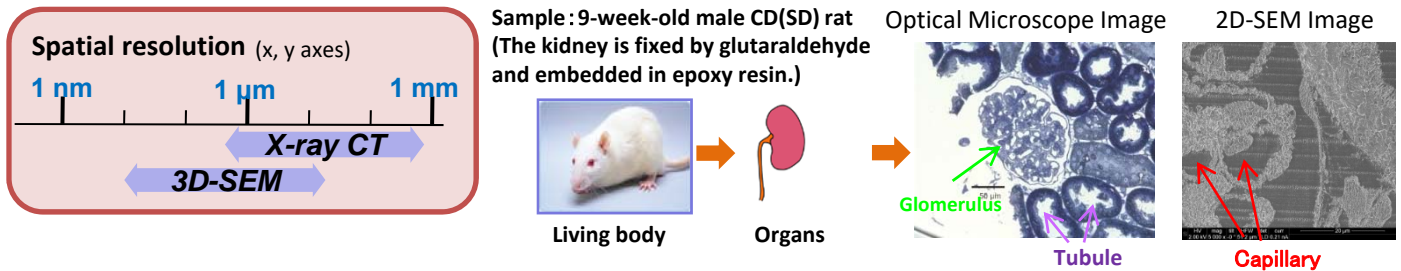


Three-dimensional analysis of rat kidney tissue using X-ray CT and 3D-SEM

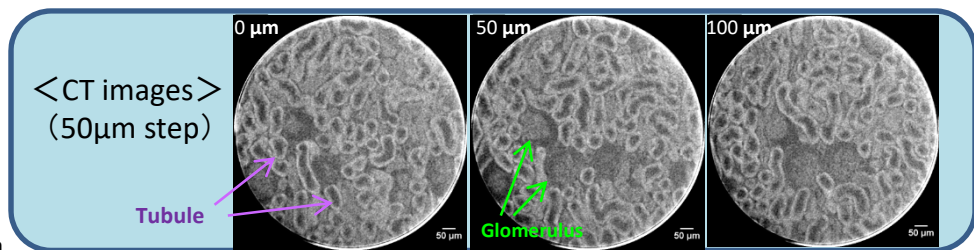
The kidney tissue of a rat is three-dimensionally observed by X-ray CT and 3D-SEM. Through imaging of tubules of a kidney and mitochondria in podocytes, we examined these techniques as three-dimensional analysis tools for biological sample.



X-ray CT

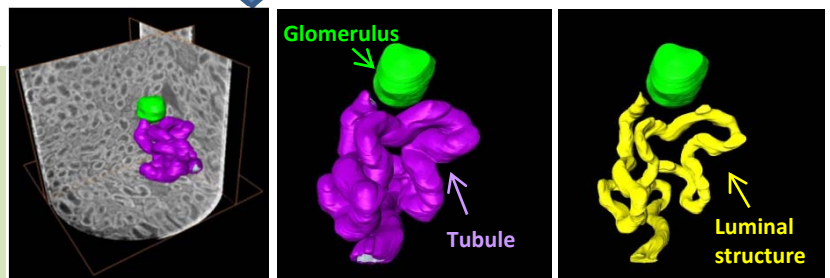
Experimental Condition

- Instrument: nano3DX (RIGAKU)
- Tube voltage: 60 kV
- Tube current: 20 mA
- Voxel size: 1.07 μm/voxel
- Observed area: 0.9mmφ × 0.7mm
- Exposure time: 35 sec/image
- Number of projections: 400 proj/180deg



<Coloring a tubule>

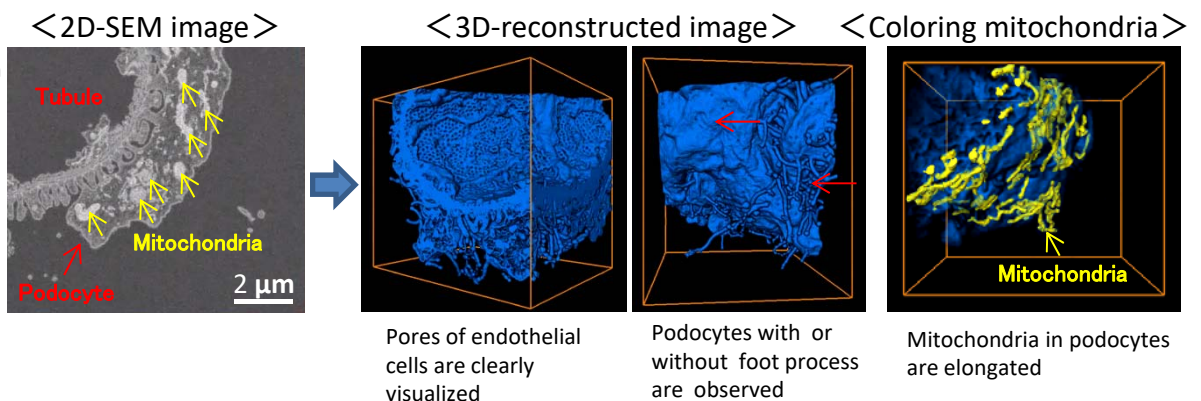
Obtaining 3D information of internal structure in mm/sub-mm range
→ Effective for targeting in 3D-SEM
• Capable of extracting 3D structure of one tubule



3D-SEM

Experimental Condition

- Instrument: Helios G3 (FEI)
- SEM accelerating voltage: 2 kV
- Voxel size: 10 nm/voxel
- Number of images: 790
- Box Size: (X) 10.0 μm (Y) 10.0 μm (Z) 7.9 μm



- Precise 3D structure can be obtained with 10nm spatial resolution.
- 3D-SEM is an effective technique for 3D analysis of internal structure of cells.

Toray Research Center, Inc. · Kamakura Techno-Science, Inc.