

New Ultra-microtome for SEM array tomography

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For morphological study of polymers, the observation of ultra-thin section with transmission electron microscope (TEM) has been widely used. This method has strongly contributed to improving their function. [1] However, in this method, generally, only a few hundred μm square and a range of about 100 nm thick can be observed.

In these days, the improvement of scanning electron microscope (SEM) and their detector enabled imaging with resolution close to that of a TEM. Therefore, SEM continuous cross-sectional observation method of acquiring continuous tomographic images with SEM and reconstructing three dimensions is widely used in the biological study. Although it contains several methods [2], array tomography observing continuous ultrathin sections prepared with an ultramicrotome is an easy-to-introduce technique that can need only a ultramicrotome and a SEM [3]. On the other hand, there has been a drawback that advanced techniques are required for preparation and collection of serial sections. To solve this, Leica Microsystems launched new ultramicrotome, which automatically makes and collects high quality serial sections with high throughput by a new collection method.

In this presentation, we will introduce the ARTOS 3D method and its application example for polymers.



Figure 1: ARTOS 3D (Left) and its collection method of serial sections (Right).

References

- [1] - H. Sano and T. Komoto, *J. Electron Microsc* **32**, 2 (1997)
- [2] – C.J. Peddie, L.M. Collinson, *Micron* **61** (2014)
- [3] – D. Koga, T. Ushiki, T. Watanabe, *Anat Sci Int.* **92**, 1 (2017)