Electron Tomography for the Post-Genomic Era

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Electron tomography defines an imaging technique associated with EM to image specimen in 3-D with angstrom (Å) scale resolution. A set of 2-D projections of an object recorded at different tilt angles is used for calculating the 3-D reconstruction. Electron tomography is a powerful tool to obtain 3-D structural information. Electron tomography is mainly composed of cellular tomography and macromolecular tomography.

Cellular Tomography

Cellular tomography is used for imaging interior of cell's. The method reconstructing 3-D structure for cellular tomography is stereo observation by disparity and tomogram by computation after overlapping each other of serial section. Viewing structures from two different angles is the key to obtaining 3-D depth perception. If one is wearing glasses designed for stereo viewing, the effect is an image that has three-dimensional appearance. Also, serial section and computer software have been the technique to gain 3-D.

Macromolecular Tomography

Macromolecular tomography means the method for single particles such as protein complexes and virus to mount on grid whole then reconstruct 3-D structure with their particle images. It contains subpart as sample and methods, single particle analysis (protein particle, protein-protein complex), icosahedral reconstruction, helical reconstruction, and electron crystallography. TEM images are acquired by negative stained sample or cryo-fixed sample. Three dimensional structure is reconstructed using computer program such as SPIDER.