

**Usefulness of helium ion microscopy for ultrastructural cell biology.****Chubu Univ.<sup>1</sup>, Hamamatsu Univ. Sch. Med.<sup>2</sup>, AIST<sup>3</sup>****°Shiro Takei<sup>1</sup>, Makoto Horikawa<sup>2</sup>, Mitsutoshi Setou<sup>2</sup>, Shinichi Ogawa<sup>2</sup>****E-mail: stakei@isc.chubu.ac.jp**

Helium ion microscopy (HIM) has recently emerged as a novel tool for ultrastructural observation in biological samples. However, optimal sample preparation method which takes advantage of characteristics of HIM for biological samples remains poorly examined. Recently, we have developed the novel sample preparation method for ultrastructural cell biology with HIM. We enabled to observe plasma membrane structures of COS-7 cells with higher resolution images by the use of chemical fixation with glutaraldehyde and osmium tetroxide, a water freeze-drying and osmium coating. By HIM observation with this sample, we observed ultrastructure of plasma membrane including caveolae and vesicle structures which are difficult to observe by conventional SEM. In this work, we discuss the advantage of HIM for biological application and the importance of sample preparation for HIM. Authors acknowledge Dr. Y. Morita and Mr. T. Iijima for the usage of AIST SCR helium ion microscope of the cell observation.

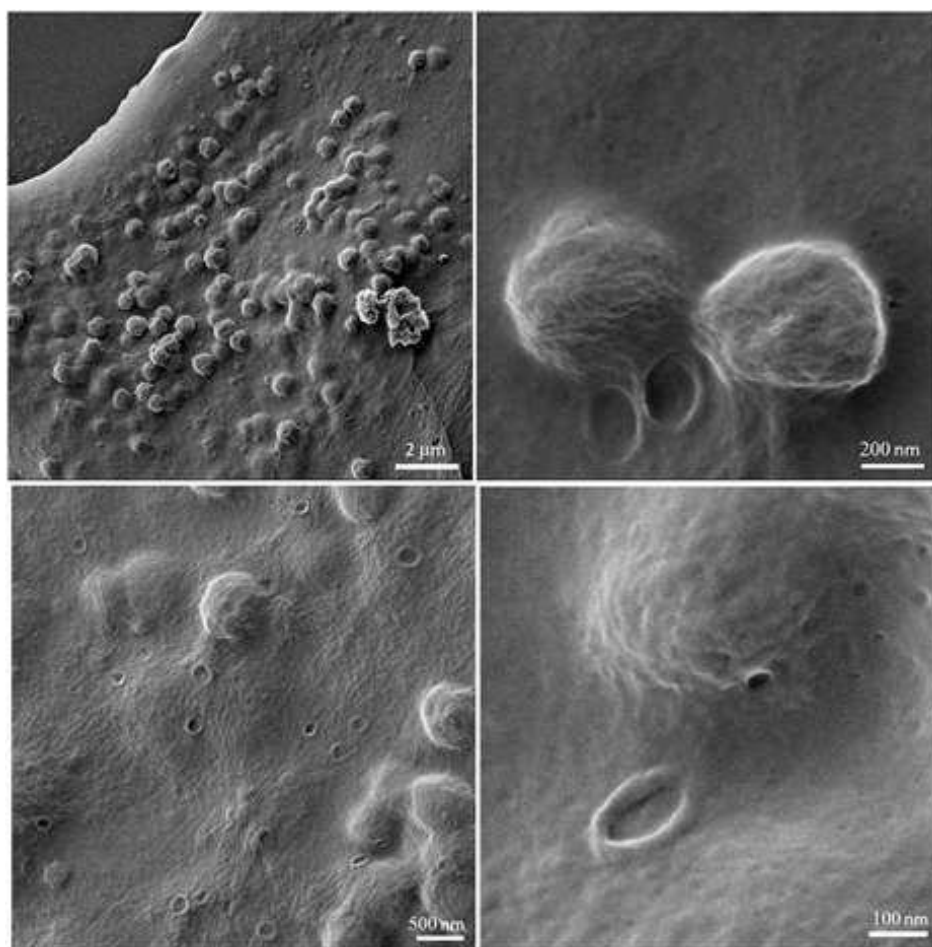


Fig. Ultrastructural observation of plasma membrane of COS-7 cell by HIM observation.