**Biological Tissue Analysis using MS images with Mass Microscope**

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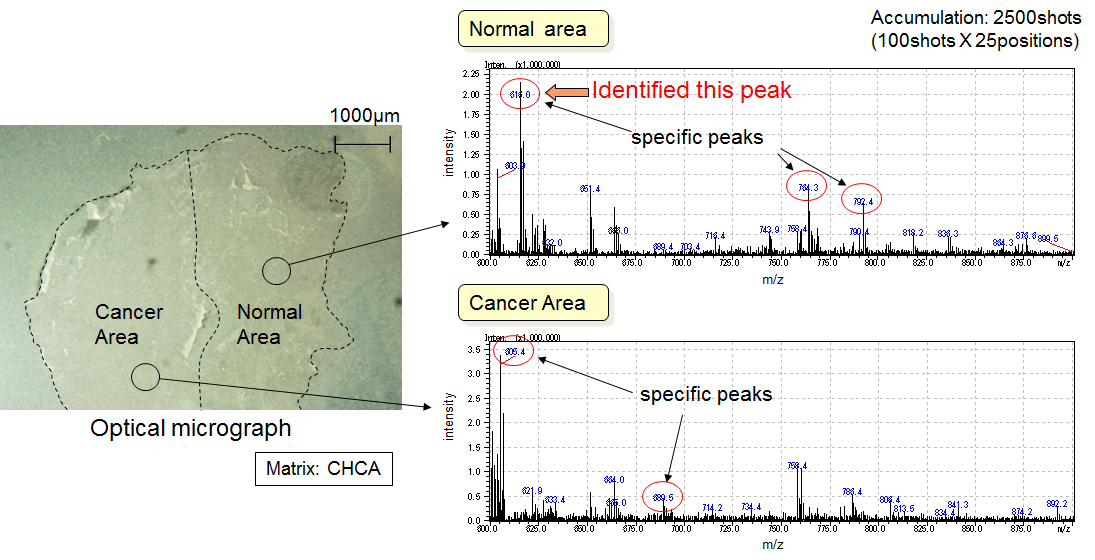
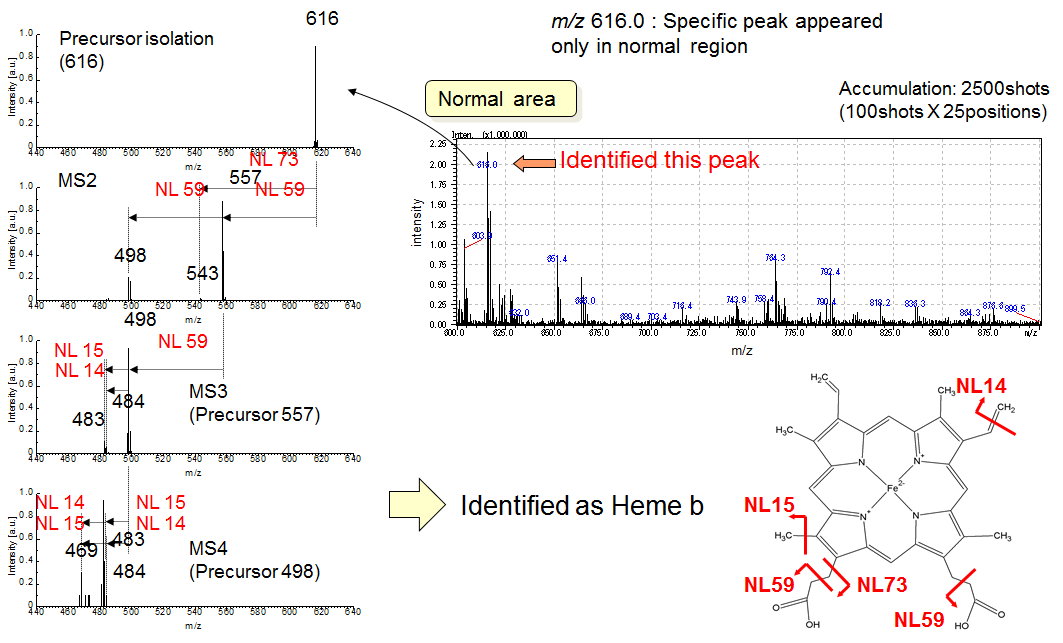
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***Introduction and Results***:

A new “mass microscope” that a combination of an optical microscope and a matrix-assisted laser desorption ionization (MALDI) mass spectrometer has been developed. The new system allows the observation of the morphology of biological molecules in tissues or cells by the optical microscope and the identification and the distribution image of the molecules by the mass spectrometer without losing the morphology observed. The system can achieve the following performance: a spot size of focused laser of 5 μm, accuracy of laser focal position of 1 μm, resolution of precursor isolation of 1000, and mass resolution of 10000. Mass imaging was performed on mouse cerebellum, for which the effective laser spot size was 10 μm or less. The bio-molecular distribution was successfully visualized with high spatial resolution. Furthermore, local analysis of human liver tissue (metastatic liver tumor from colorectal cancer) was performed. The analysis results show that the instrument has the capability of performing MSn identification (up to n=4) of molecules specifically present in a noncancerous region (heme b). The instrument could be useful in the pathological and pharmaceutical research fields.

***Keywords:*** mass microscope, visualization, MALDI, LCMS-IT-TOF

***Introduction to the authors:***

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Dr. Hashi graduated from Dept. of Chemistry, Osaka University, Osaka, Japan in 1986. At the same year, he joined Shimadzu Corporation, analytical instrument division to develop HPLC instrument especially electrochemical detector and column packing materials for protein analyses. In 1994, he moved to Shimadzu Singapore as an application manager for chromatography instruments to take care of the customers in South-East Asia as well as south Asia countries. His major area of interest is development of new application system using LC, GC, LCMS and GCMS for the enhancement of analysis efficiency. Based on this research work, he has received a Ph.D. degree from Research Center for Eco-Environmental Sciences, The Chinese Academy of Sciences in 2009. He is developing new analytical methods with Chromatographic system extensively in the various fields such as food safety, environmental, pharmaceutical and life science (genomics and proteomics). Beside his research work, he is also actively providing the lecture of basic instrumentation in university, and contributing his papers to some technical conferences.