Technical note No 10 for Kawamotos film method 2020

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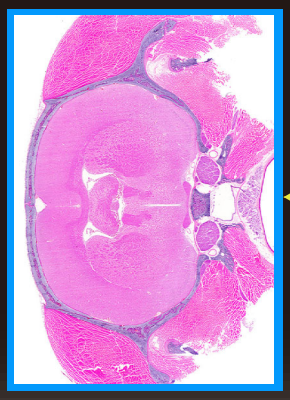
Application for MALDI-MSI

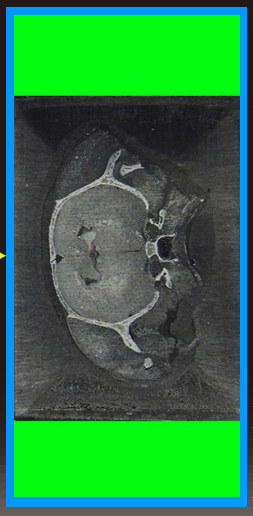
Advantages of Kawamoto's film method on the MALDI-IMS

1) The method produces perfect frozen sections without special training.
2) The method can be applied for many kinds of sample (soft tissues, hard tissues, insect, and plants et al).
3) The method can be used for different types of study (histology, histochemistry, immuno-histochemistry, in-situ hybridization, gene anlysis using LMD technique, and MALDI-IMS).
4) No signals derived from the embedding medium(SCEM) are detected in the tissue areas.
5) The runnning cost is lower than that by an ITO glass slide.



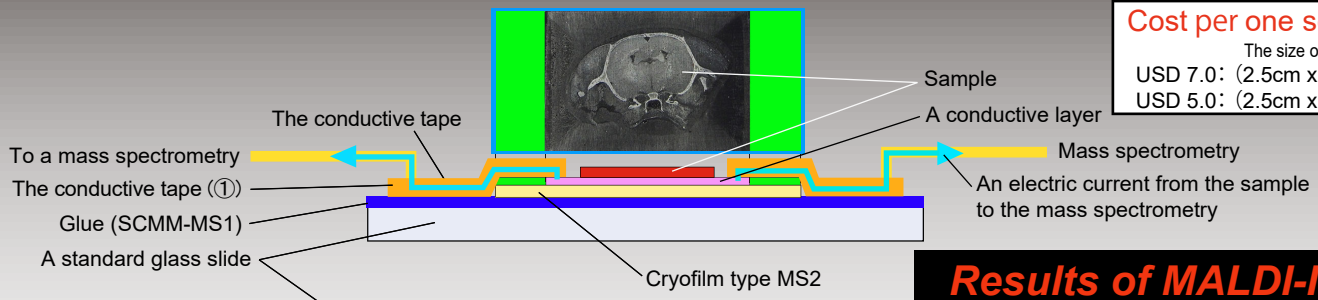
A section made with Cryofilm type 4D(16UF)
(H-E stain, 3μm thick section)

A frozen sample surface
(The head of an adult rat)



A section made with a Cryofilm type MS2
(10μm thick section, for MALDI-IMS)

Cost per one section
The size of section
USD 7.0：(2.5cm x 2.0cm)
USD 5.0：(2.5cm x 1.5cm)

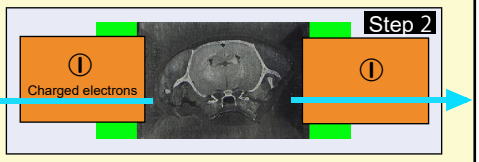


Sample preparation

1) Fix the Cryofilm type MS2 on the standard glass slide with a mounting medium(SCMM-MS1). (the SCMM is polimerized with a UV light.)

The most important point is to make a flat surface of Cryofilm onto the glass slide.

2) Place the conductive adhesive tape① on the Cryofilm and glass slide as shown in the step 2. (The tape ① is made with a copper foil.)



The charged electrons on the sample are released to the mass spectrometry via the copper tape ①.

Materials

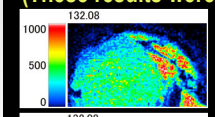
Embedding medium: SCEM
Blade: SL-T30UF
Adhesive film: Cryofilm type MS2 (for the MALDI-IMS)
Adhesive film: Cryofilm type 4D(16UF) (for histological applications)
Material for fixing the Cryofilm to the glass slide: SCMM-MS1

Recommendation

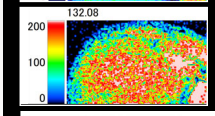
The starter kit is very useful for introducing Kawamoto's film method.
The kit contains a video and all of the tools used for the method.

Results of MALDI-IMS

(These results were made with seiral sections)

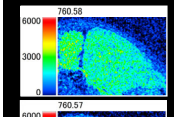


on a ITO glass slide

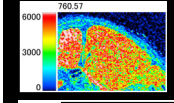


on the Cryofilm type MS2
(a conductive type)

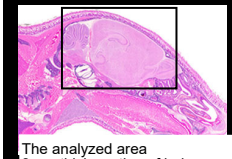
The analyzed area
3 μm thick section of baby mouse



on the Cryofilm type 2C(9)
(a non-conductive type)



on the Cryofilm type MS2
(a conductive type)



Analytical Chemistry, 2019
by Dr. Daisuke Saigusa
(Tohoku University)

The analyzed area
3 μm thick section of baby mouse