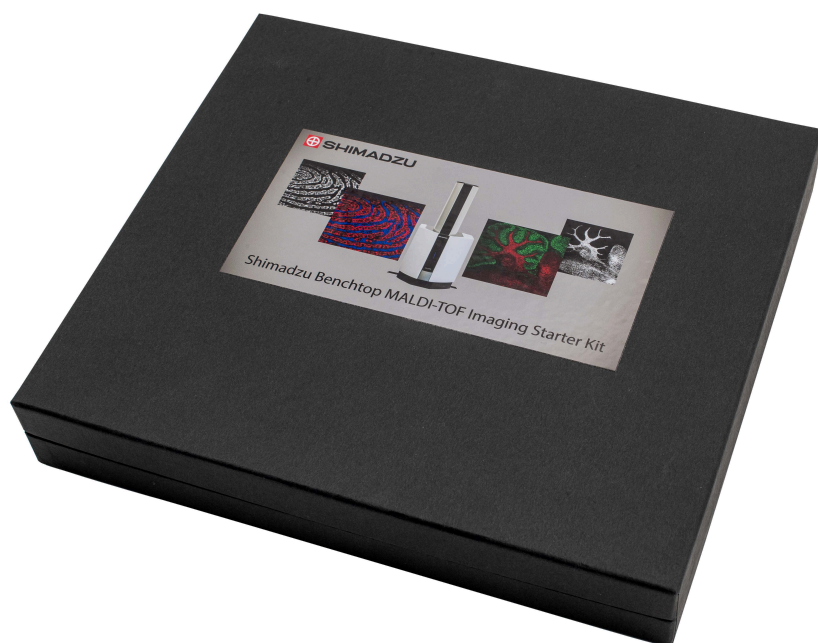
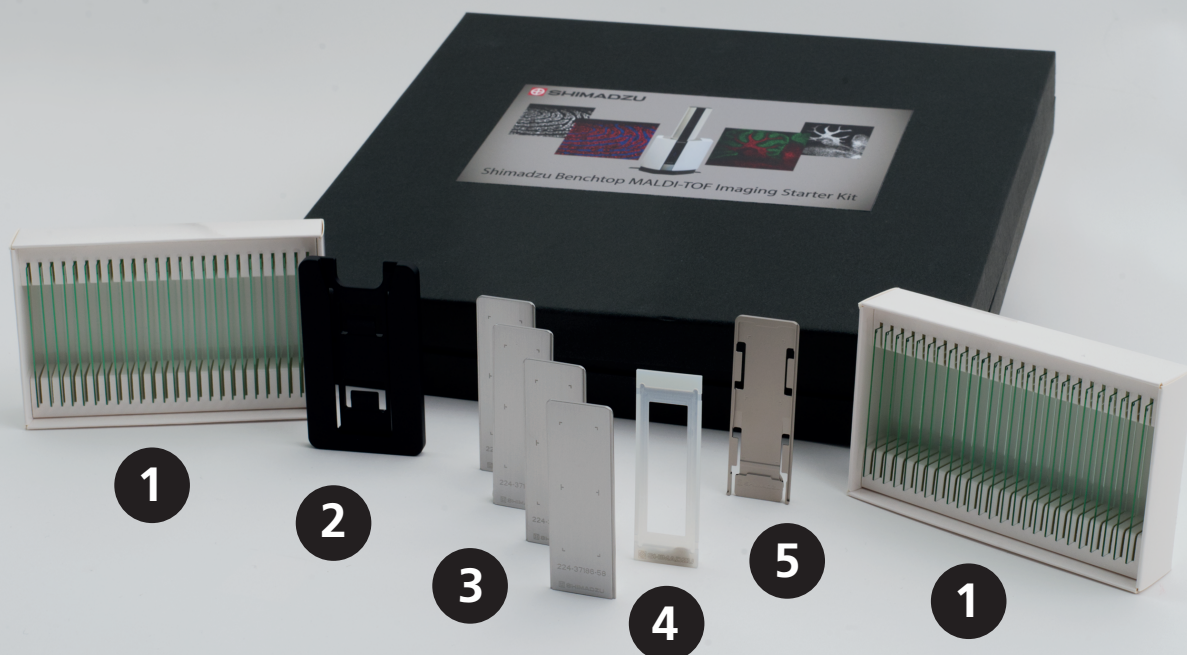


Imaging Application Solution for Your Benchtop MALDI-TOF Mass Spectrometer

# Benchtop MALDI-TOF Imaging Starter Kit



# ALL-INCLUSIVE DESIGN

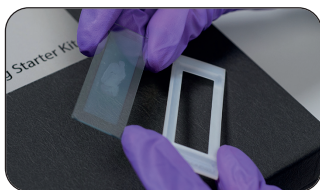


## Benchtop Imaging Kit contains all you need...^

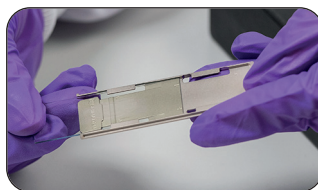
<b>1</b>	FlexiVision™-mini ITO slides (2 packs of 25 slides)	Single-use glass slides custom-sized to fit in MALDI-8020™/MALDI-8030™ mass spectrometers when assembled with Adaption™-mini glass slide adapter
<b>2</b>	Adaption™-mini carrier	Used during optical scanning to securely hold either the Adaption™-mini adapter/ FlexiVision™-mini ITO sample slide or the FlexiMass™-SR1 Stainless steel sample plate. Ensures the sample slide surface does not contact the scanner surface
<b>3</b>	FlexiMass™-SR1 reusable metal sample plates (4 plates)	Reusable* FlexiMass format, engraved with the accessible sample area to aid mounting of samples
<b>4</b>	Slide mask	Fits over the FlexiVision™-mini ITO slides during matrix coating or tissue mounting to clearly identify the usable target area
<b>5</b>	Adaption™-mini ITO glass slide adapter	Custom glass slide holder for use with the FlexiVision™-mini ITO slides
	MALDI Solutions™ imaging acquisition licence	Provides the imaging acquisition wizard to co-register the optical image and define the area to be acquired
	IonView™ MALDI imaging software licence	Software for processing MALDI images. Reads data directly from MALDI Solutions

\*follow appropriate washing procedure; ^ also includes Benchtop Imaging User Guide DVD and Product Insert Sheet

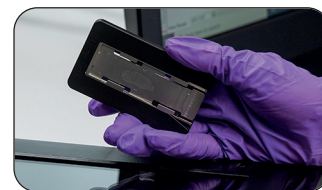
### KIT USAGE EXAMPLES



FlexiVision™-mini ITO slide used with slide mask during matrix coating



FlexiVision™-mini ITO slide used with Adaption™-mini adapter



FlexiVision™-mini ITO slide (within Adaption™-mini adapter) used with carrier during optical scanning

# IMAGING UPGRADE



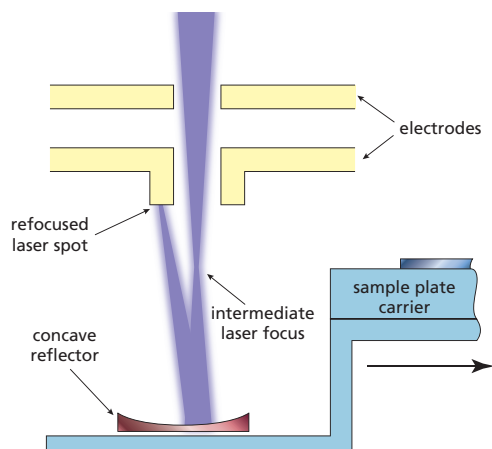
The Benchtop MALDI-TOF Imaging Starter Kit provides a complete MALDI imaging application solution to your existing Shimadzu MALDI-8020 and MALDI-8030 benchtop MALDI-TOF instruments\*. The kit has been developed and robustly tested to the highest quality standards to provide reliable imaging mass spectrometry results.

\*requires MALDI Solutions 2.10 or later and Adapt/ion-mini plate file; some changes may be required to PC hardware on existing MALDI-8020 or MALDI-8030 instruments

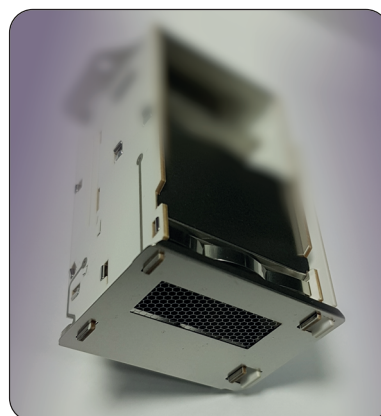
## Shimadzu benchtop MALDI instruments are IDEAL FOR IMAGING:

- ◆ Class-leading sensitivity and mass resolution of the MALDI-8020 and MALDI-8030.
- ◆ FastMS feature - with the 200 Hz laser, fast sample slide introduction (<3 min) and quick sample stage – provides the speed to attain up to 15 pixels per second (lipid imaging acquisition (100-1200  $m/z$ ) at 50  $\mu m$  spacing using an accumulation rate of 10 shots/profile).
- ◆ Robustness provided by the class-leading long-lasting laser lifetime of 2 billion shots<sup>†</sup>, the self-cleaning ion optics using the patented TrueClean™ one-click laser technology – for reduced engineer call-outs, and the long-life, slow-ageing AeonDetector™ which means less intervention even after continuous use in imaging experiments.

<sup>†</sup> or 12 months warranty



Schematic of TrueClean one-click laser technology



The AeonDetector has up to 7x longer life and reduced ageing rate

**Benchtop MALDI-TOF**

Imaging Starter Kit

# MALDI IMAGI

There are three main steps in the MALDI imaging workflow after collection of tissue sections:

- 1 Sample pre-treatment and MALDI matrix coating
- 2 MALDI data acquisition
- 3 MALDI data processing

Solutions are provided in each step to make an otherwise typically difficult imaging workflow into a simple user-friendly application with a successful outcome for your laboratory.

1

## MATRIX COATING

- Automated MALDI matrix coating devices available
- Easy to use
- Simple selection of pre-set methods
- High reproducibility
- Refined crystal size improves mass and spatial resolution and ionisation efficiency



**iMLayer™** matrix sublimation device: ideal for intact molecule imaging

OR



**iMLayer AERO™** automated sprayer: ideal for on-tissue digestion imaging

2

## DATA ACQUISITION

- Easy to use imaging acquisition wizard
- FastMS offers speed
- AeonDetector offers robustness
- TrueClean means easy to clean ion source



**MALDI-8020** linear MALDI-TOF mass spectrometer

OR



**MALDI-8030** linear MALDI-TOF mass spectrometer with dual-polarity

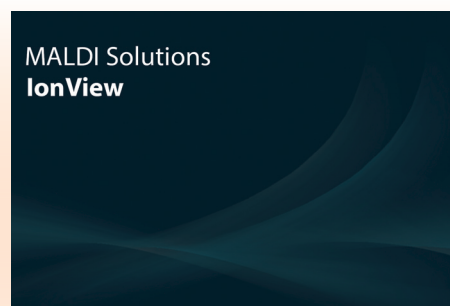
3

## DATA PROCESSING

- IonView imaging viewing software is easy to use
- Reads data directly from instrument
- Quick to reload generated IonView files
- Separate workstation available for user convenience
- Export to imzML (for statistical analysis in IMAGEREVEAL™ MS\* imaging software)

\* Not included in Benchtop MALDI-TOF Imaging Starter kit

MALDI Solutions  
**IonView**



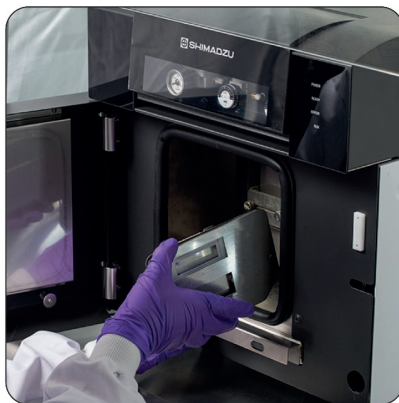
**IonView** imaging viewing software

# ING SIMPLIFIED

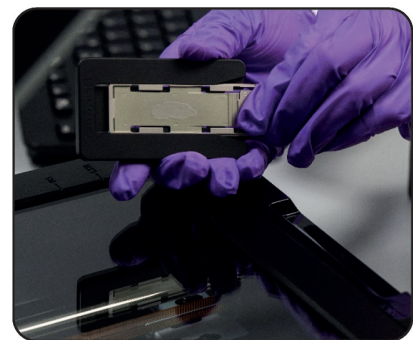


Prepared tissue sections

Coating



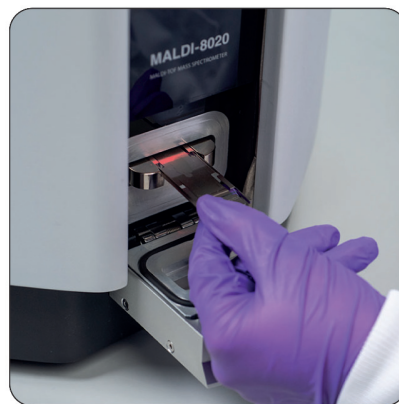
Optical scan



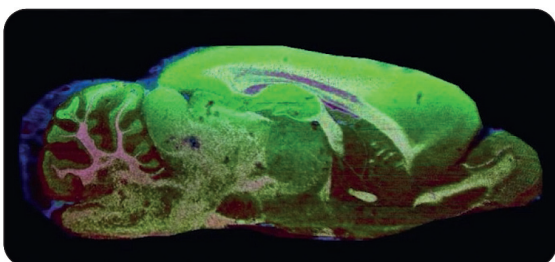
Run imaging wizard



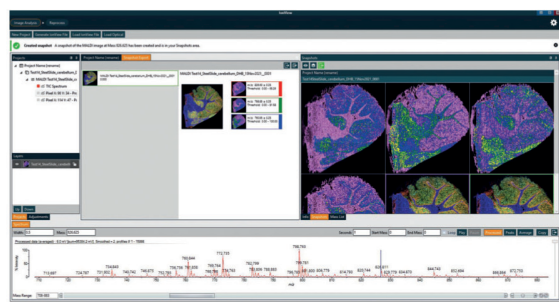
Load



View image



Snapshot regions of interest (ROIs)

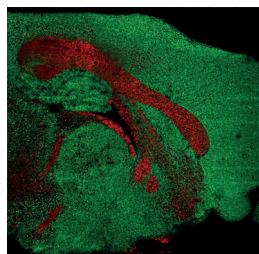


**Benchtop MALDI-TOF**

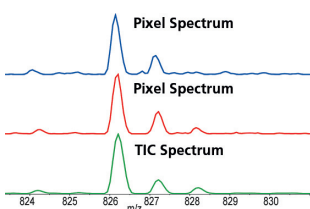
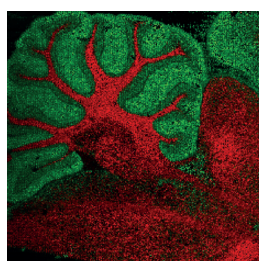
Imaging Starter Kit

# A GALLERY OF

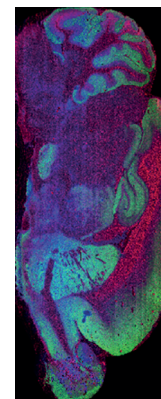
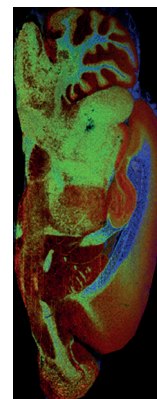
## Rat brain sections (lipids)



MALDI images of rat brain measured at 30  $\mu\text{m}$  spacing using FlexiMass-SR1 reusable metal slide and sublimated with DHB in iMLayer: (top) coronal section, overlay of  $m/z$  772 and  $m/z$  788; (bottom) cerebellum, overlay of  $m/z$  734 and  $m/z$  826 with example TIC and pixel spectra showing good resolution.



## Full rat brain (lipids)



MALDI images of full rat brain using FlexiVision-mini ITO glass slide and matrix sublimation with iMLayer:

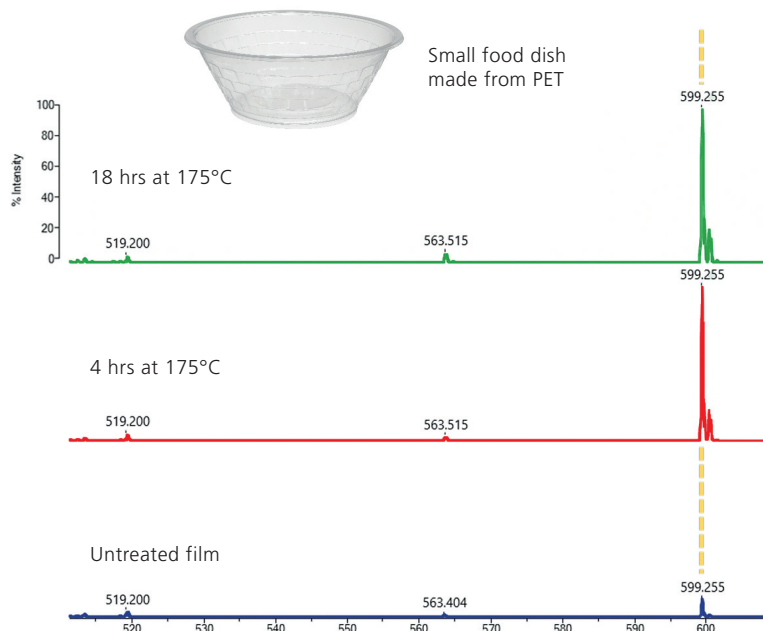
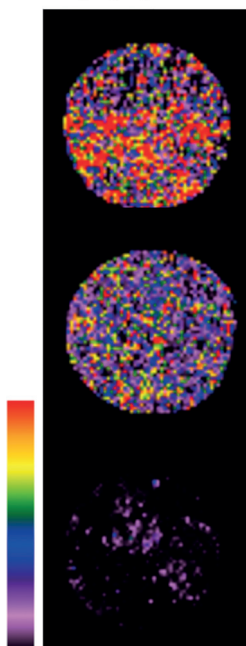
(left) optical scan;

(middle) positive ion mode, overlay of  $m/z$  798,  $m/z$  866,  $m/z$  645 using DHB, 30  $\mu\text{m}$  spacing;

(right) negative ion mode, overlay of  $m/z$  521,  $m/z$  834,  $m/z$  344 using 9-AA, 50  $\mu\text{m}$  spacing.

## Food contact material (PET)

600  $\mu\text{m}$

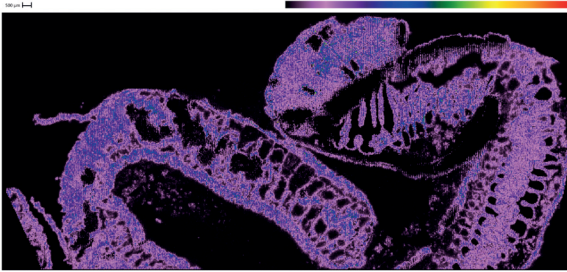


"Mapping" of cyclic trimer of PET in food contact material under various heat stress conditions using 50  $\mu\text{m}$  spacing. PET films were coated with dithranol matrix containing NaI by spraying.

[material source: Yamazaki Y, ASMS 2021 Poster ThP225].

# APPLICATIONS...

## Environmental



Distribution of  $m/z$  86 analyte in earthworm treated with a statin (1000% simvastatin).

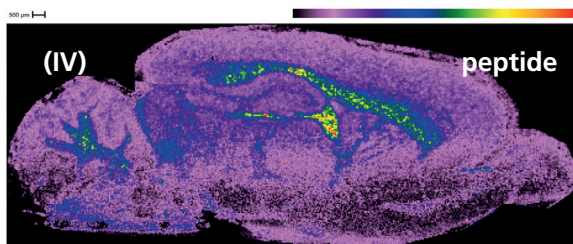
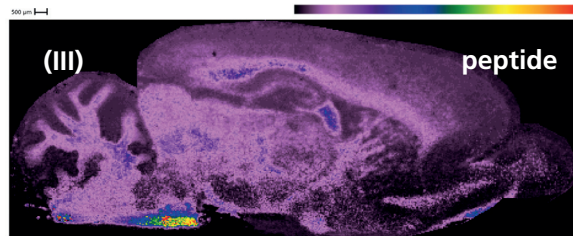
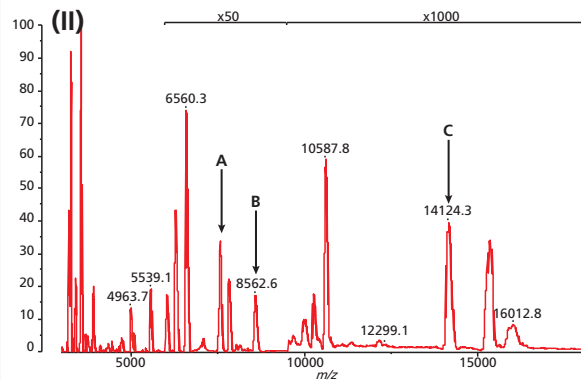
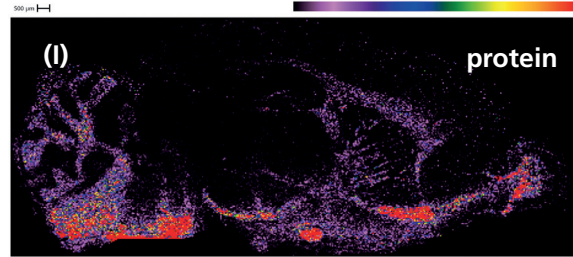
Measurement using FlexiVision-mini ITO glass slide and matrix coating with DHB; 50  $\mu\text{m}$  spacing.

[material source: Kendra Selby, Stephanie L. Shan, and Kevin R. Tucker, Southern Illinois University Edwardsville ASMS 2021 poster WP077]



**Kevin Tucker**, Assistant Professor,  
Analytical Chemistry  
Department of Chemistry  
Southern Illinois University Edwardsville  
(SIUE)

## Protein imaging/on-tissue digestion

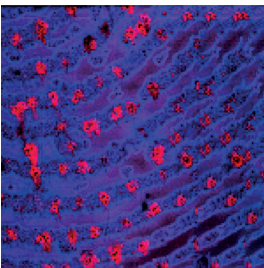
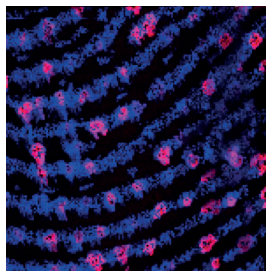
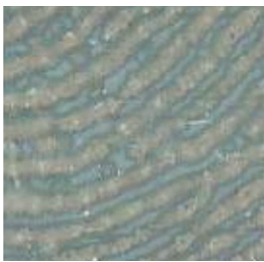


MALDI images showing myelin basic protein (MBP) in full rat brain, using FlexiVision-mini ITO glass slide and matrix coating with spraying: (I) intact MBP, using sinapinic acid coating in iMLayer AERO, 50  $\mu\text{m}$  spacing and acquisition time  $\sim 3.8$  h; (II) related acquisition TIC spectrum showing MBP\* (C,  $m/z$  14124), Neurogranin\* (A,  $m/z$  7537) and Ubiquitin\* (B,  $m/z$  8565); (III and IV) peptides from on-tissue digestion, using CHCA, 50  $\mu\text{m}$  spacing and acquisition time  $\sim 2.8$  h. III = MBP Peptide\*: HGFLPR, ( $m/z$  726.39); IV = MBP Peptide\*: YLATASTMDHAR, ( $m/z$  1336.63).

[material source: Rawlins CR, ASMS 2021 Poster FP308]

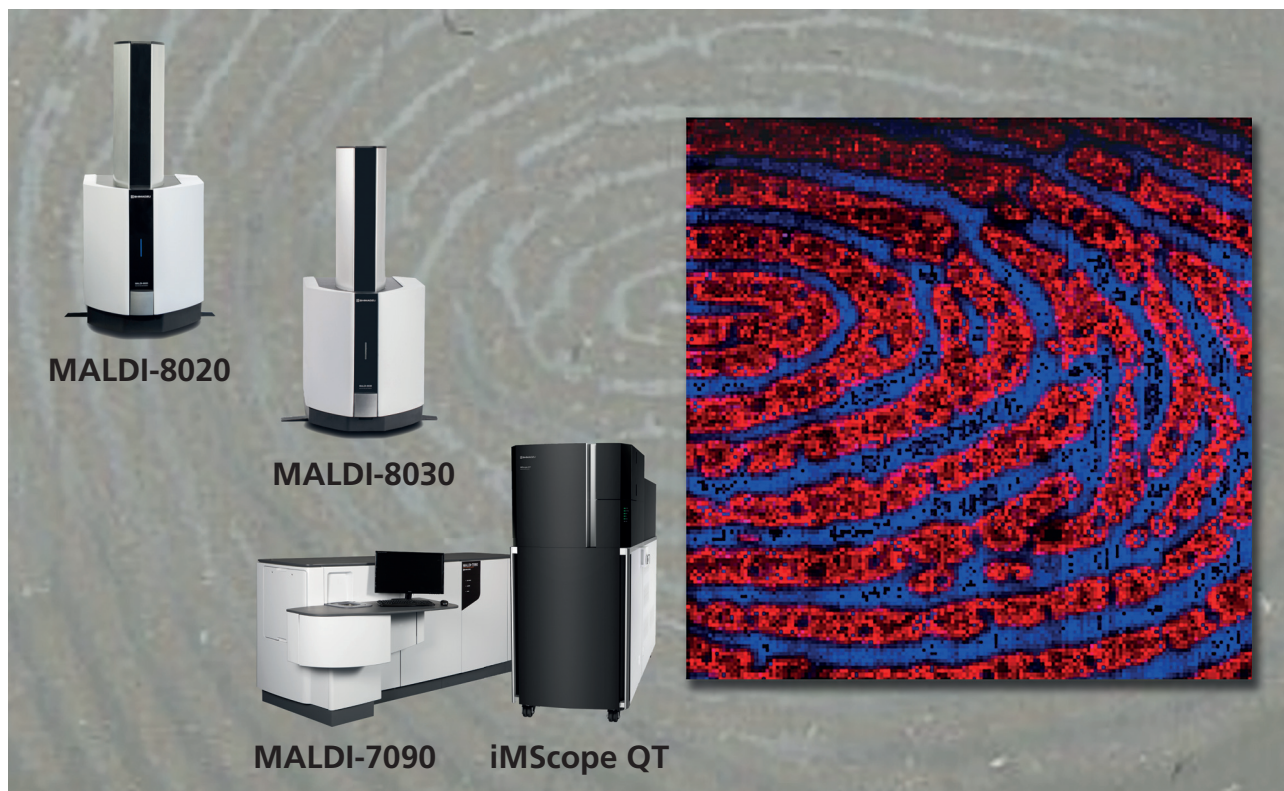
\* tentatively assigned

## Fingerprint (lipids)



MALDI images of fingerprint using FlexiMass-SR1 reusable metal slide and DHB sublimation with iMLayer: (top left) optical scan; (top right) overlay of  $m/z$  375,  $m/z$  829; (bottom) overlay of  $m/z$  567,  $m/z$  549. 30  $\mu\text{m}$  spacing, 23104 profiles, acquisition time  $\sim 3.5$  h.

# IMAGING TEAM-UP



**Maximise your output by combining members of the MALDI imaging dream team:** Utilise the more cost-effective MALDI-8020 and MALDI-8030 instruments to increase the productivity of your more expensive, higher-end instrumentation e.g. MALDI-7090™ and the iMScope QT™. Routine experiments such as optimisation of time-consuming sample preparation methods or lower resolution analyses can be performed on the benchtop systems, thereby freeing up time on higher performance instrumentation for dedicated samples.

(Fingerprint image from MALDI-8020 using 30 µm spacing on FlexiMass-SR1 reusable metal slide, DHB sublimated with iMLayer).

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IMAGEREVEAL MS, iMLayer, and iMScope are trademarks of Shimadzu Corporation.



Discover more!

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URL <http://www.shimadzu.com/an/>



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