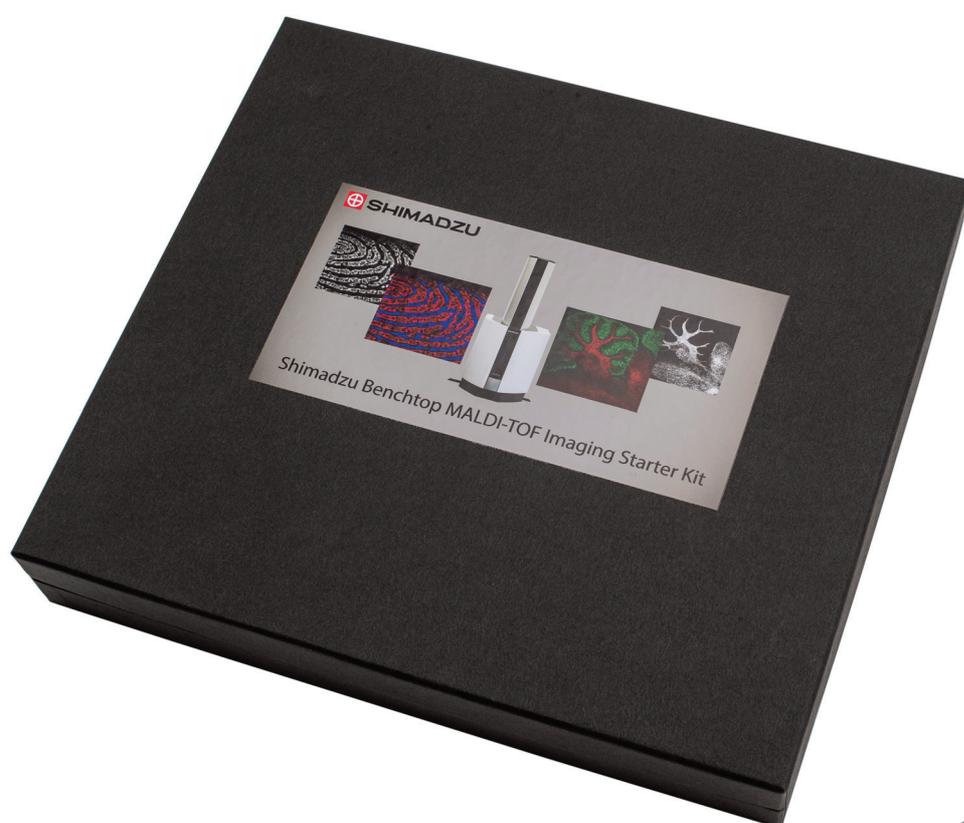
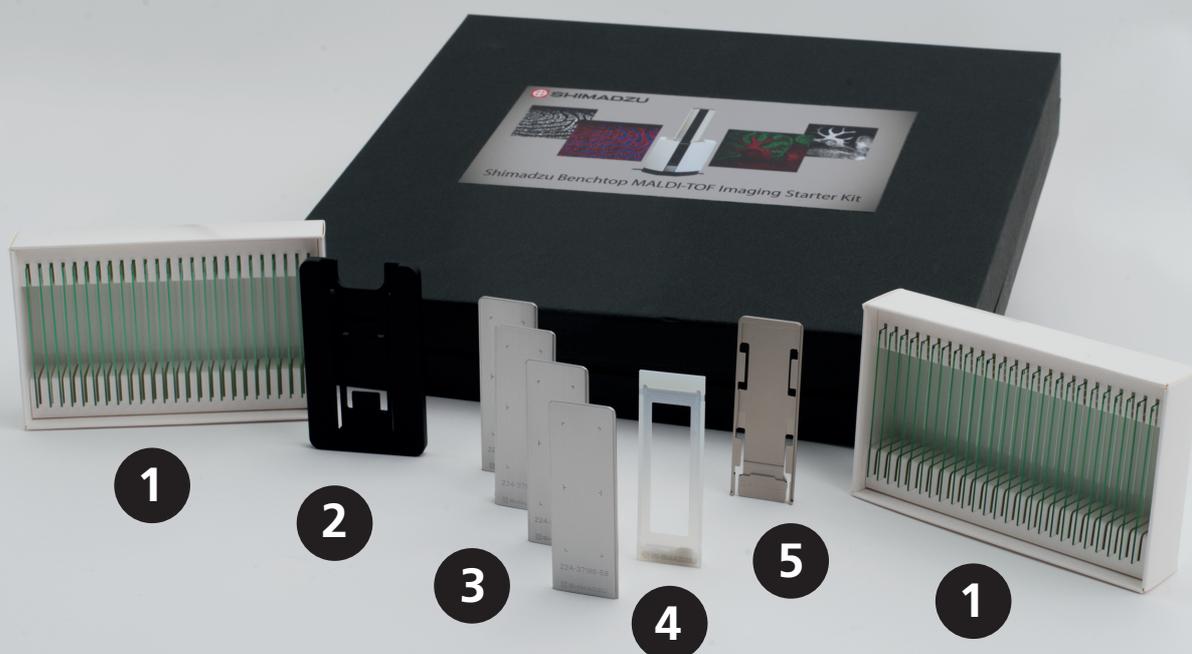


Imaging Application Solution for Your Benchtop MALDI-TOF Mass Spectrometer

Benchtop MALDI-TOF Imaging Starter Kit



ALL-INCLUSIVE DESIGN

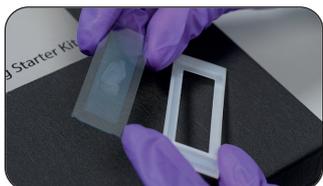


Benchtop Imaging Kit contains all you need...[^]

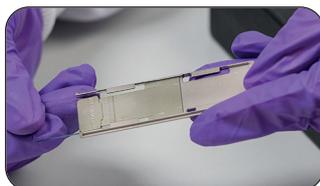
1	FlexiVision™-mini ITO slides (2 packs of 25 slides)	Single-use glass slides custom-sized to fit in MALDI-8020™/MALDI-8030™ mass spectrometers when assembled with Adaption™-mini glass slide adapter
2	Adaption™-mini carrier	Used during optical scanning to securely hold either the Adaption™-mini adapter/ FlexiVision™-mini ITO sample slide or the FlexiMass™-SR1 Stainless steel sample plate. Ensures the sample slide surface does not contact the scanner surface
3	FlexiMass™-SR1 reusable metal sample plates (4 plates)	Reusable* FlexiMass format, engraved with the accessible sample area to aid mounting of samples
4	Slide mask	Fits over the FlexiVision™-mini ITO slides during matrix coating or tissue mounting to clearly identify the usable target area
5	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



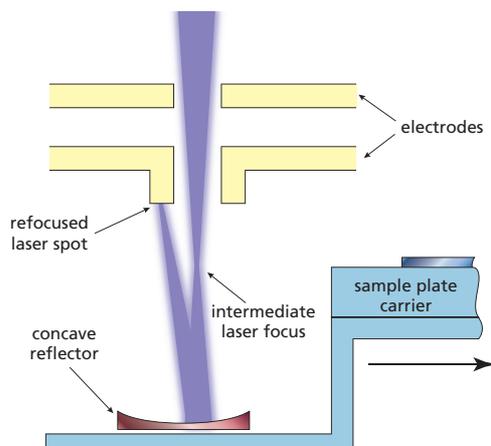
The Benchtop MALDI-TOF Imaging Starter Kit provides a complete MALDI imaging application solution to your existing Shimadzu MALDI-8020 and MALDI-8030 benchtop MALDI-TOF instruments*. The kit has been developed and robustly tested to the highest quality standards to provide reliable imaging mass spectrometry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

*requires MALDI Solutions 2.9 or later and Adaption-mini plate file; some changes may be required to PC hardware on existing MALDI-8020 or MALDI-8030 instruments

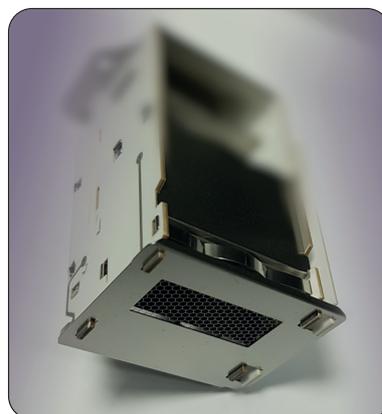
Shimadzu benchtop MALDI instruments are IDEAL FOR IMAGING:

- ◆ 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 μm spacing using an accumulation rate of 10 shots/profile).
- ◆ Robustness provided by the class-leading long-lasting laser lifetime of 2 billion shots[†], 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.

[†] 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
- Export to imzML (for statistical analysis in IMAGEREVEAL™ MS* imaging software)

* Not included in Benchtop MALDI-TOF Imaging Starter kit



MALDI-8020 linear MALDI-TOF mass spectrometer

OR

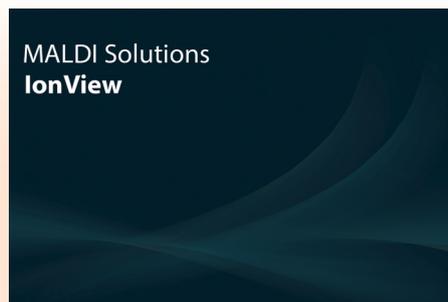


MALDI-8030 linear MALDI-TOF mass spectrometer with dual-polarity

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



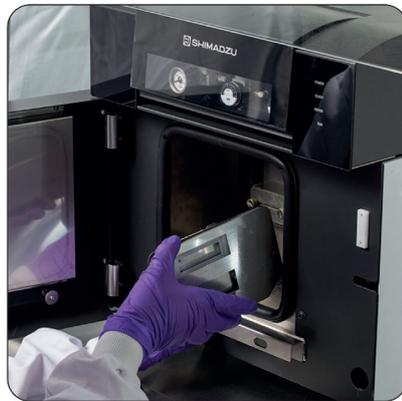
IonView imaging viewing software

ING SIMPLIFIED



Prepared tissue sections

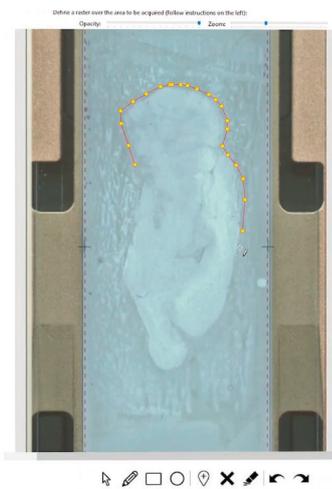
Coating



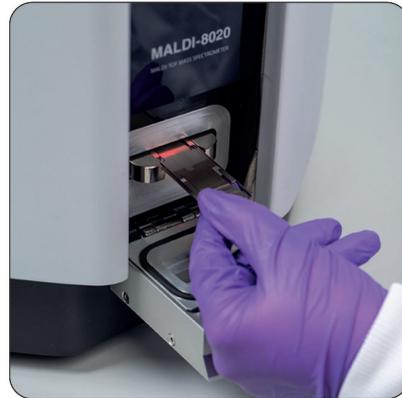
Optical scan



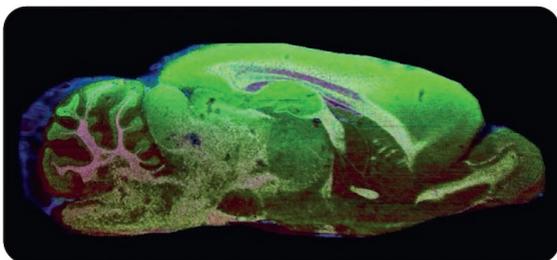
Run imaging wizard



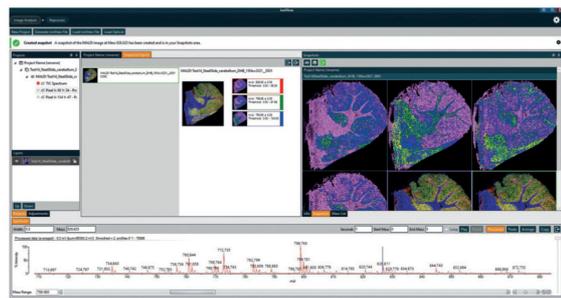
Load



View image



Snapshot regions of interest (ROIs)

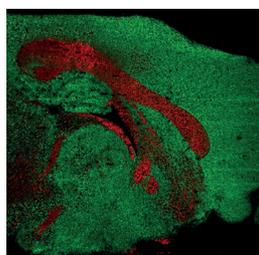


Benchtop MALDI-TOF

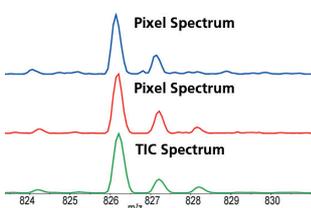
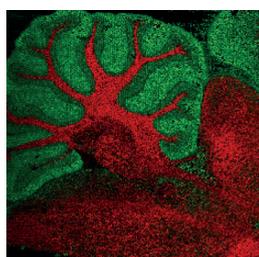
Imaging Starter Kit

A GALLERY OF

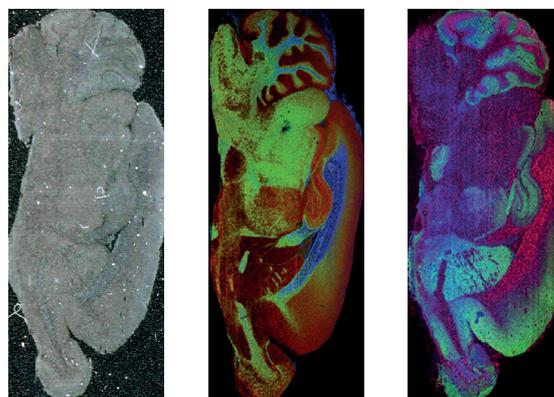
Rat brain sections (lipids)



MALDI images of rat brain measured at 30 μm 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.



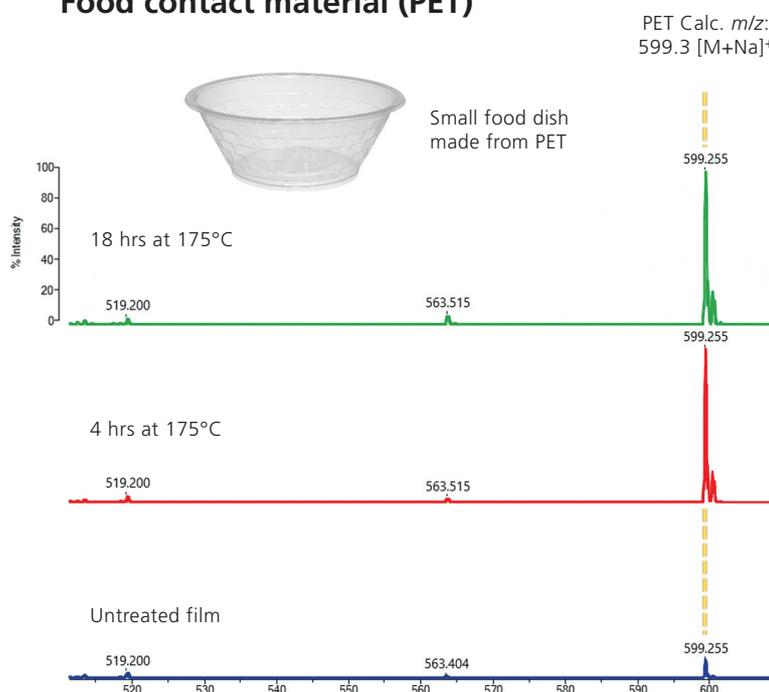
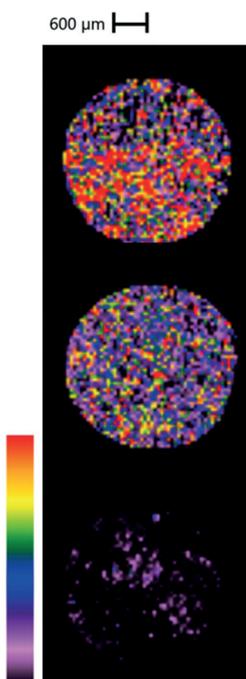
Full rat brain (lipids)



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 μm spacing;
(right) negative ion mode, overlay of m/z 521, m/z 834, m/z 344 using 9-AA, 50 μm spacing.

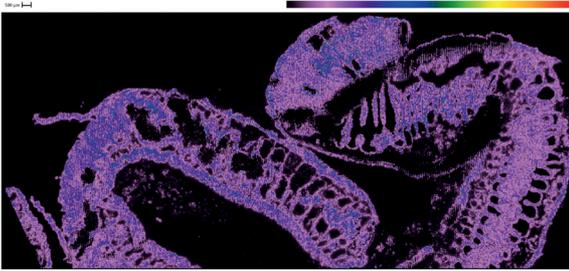
Food contact material (PET)



"Mapping" of cyclic trimer of PET in food contact material under various heat stress conditions using 50 μm 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).

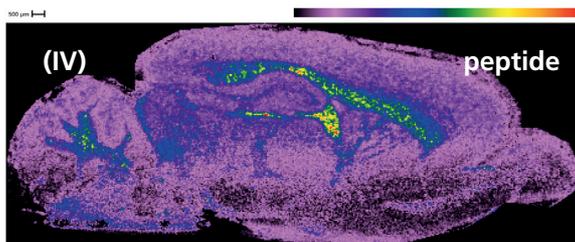
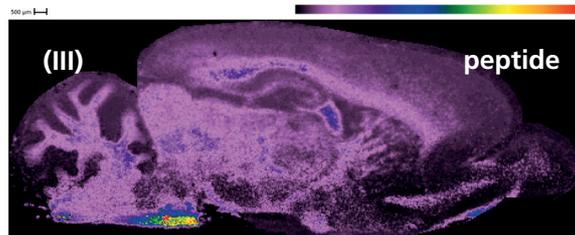
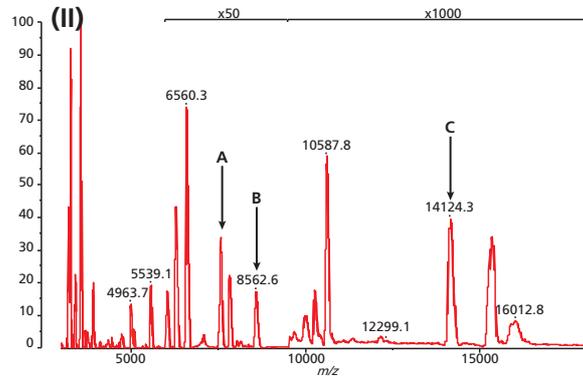
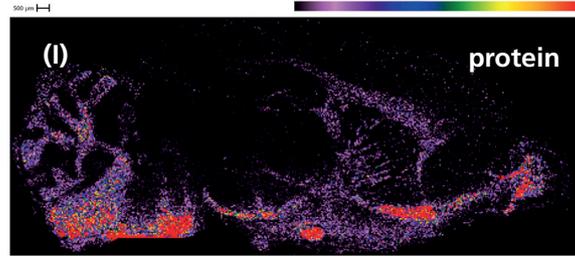
Measurement using FlexiVision-mini ITO glass slide and matrix coating with DHB; 50 μ m spacing.

[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

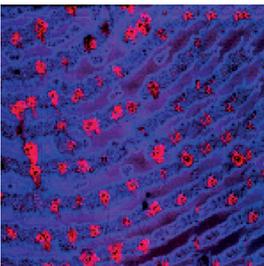
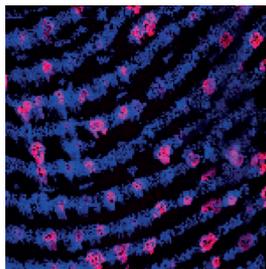
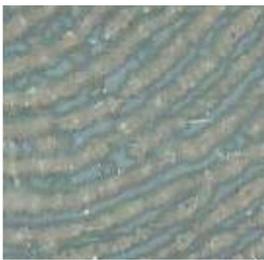


MALDI images showing myelin basic protein (MBP) in full rat brain, using FlexiVision-mini ITO glass slide and matrix coating with spraying: (I) intact MBP, using sinapinic acid coating in iMLayer AERO, 50 μ m spacing and acquisition time \sim 3.8 h; (II) related acquisition TIC spectrum showing MBP* (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 μ 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]

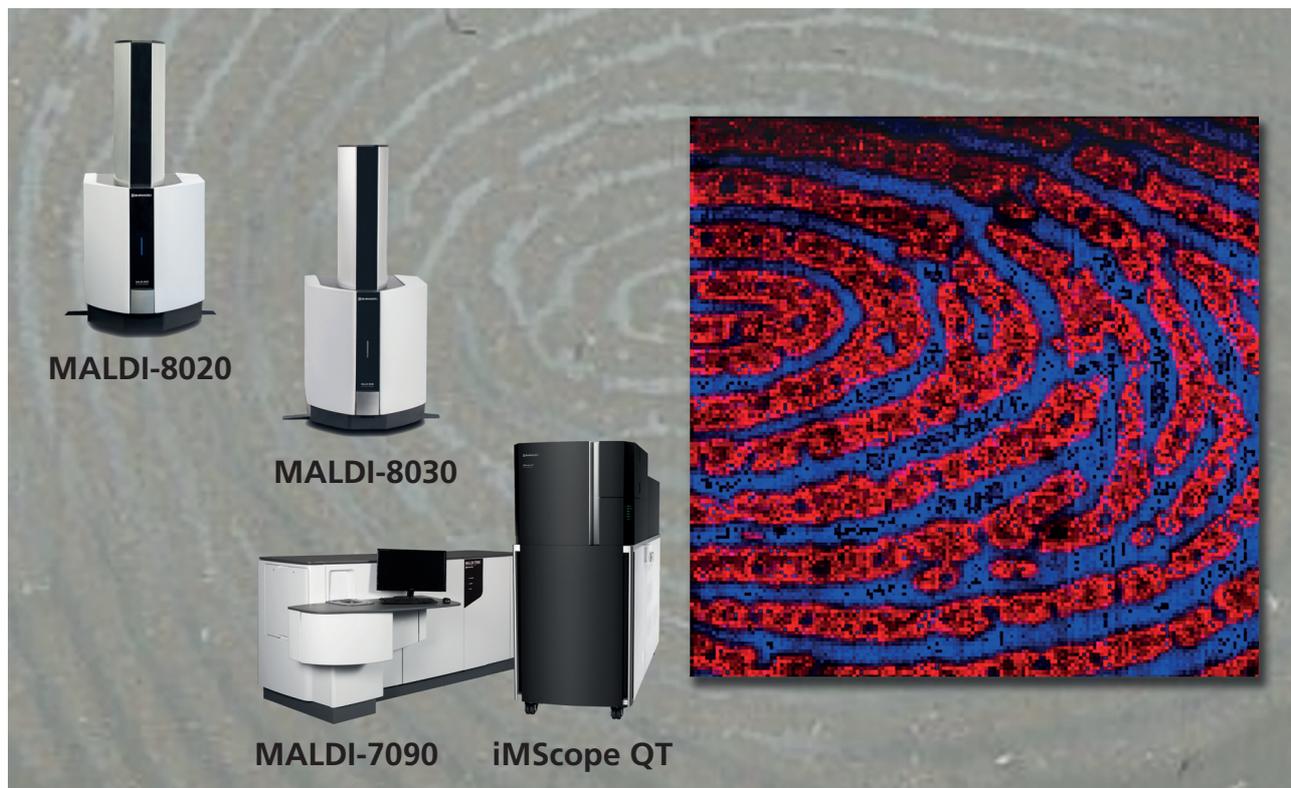
* tentatively assigned

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 μ 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.



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