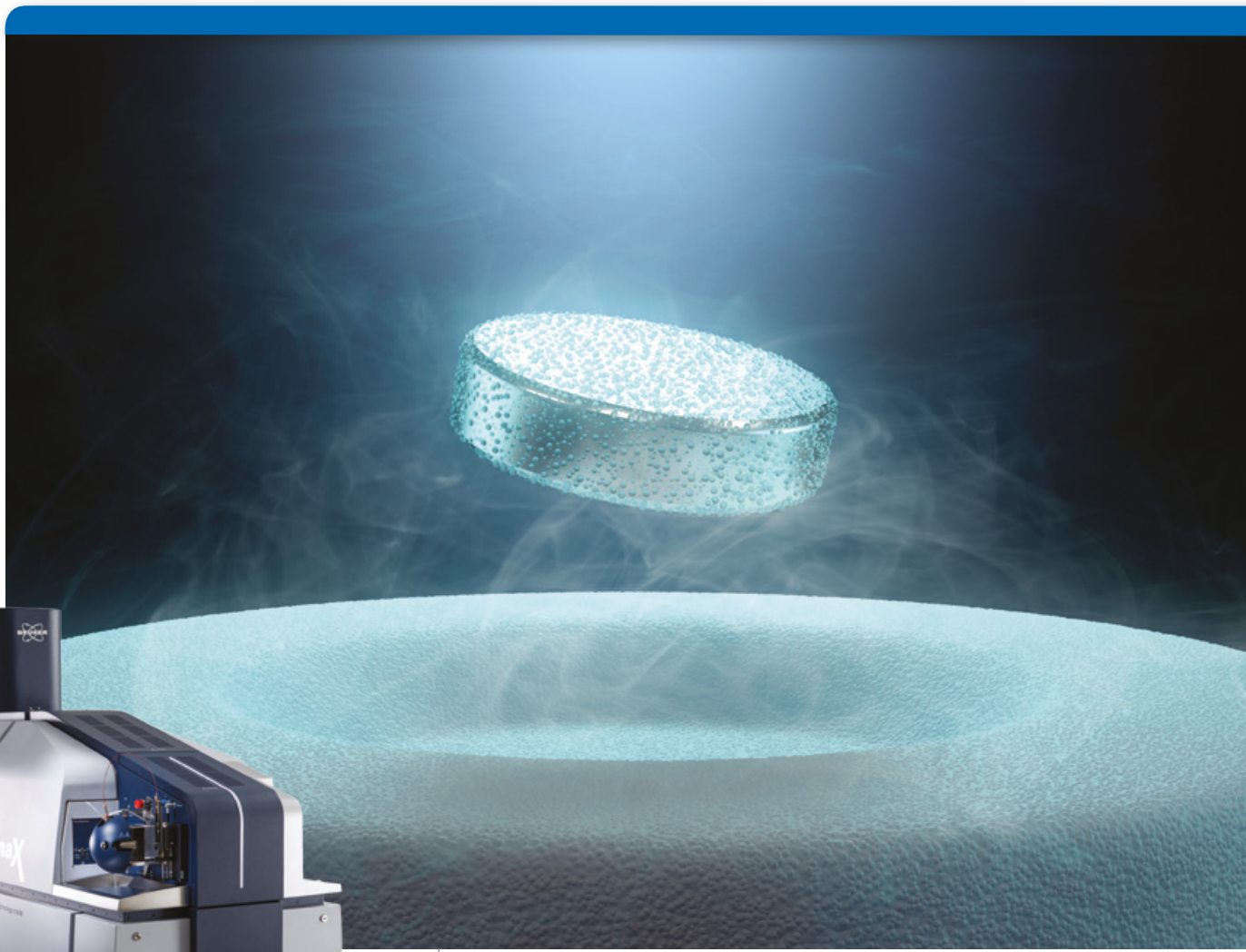
BRUKER



scimaX

Identify with Confidence

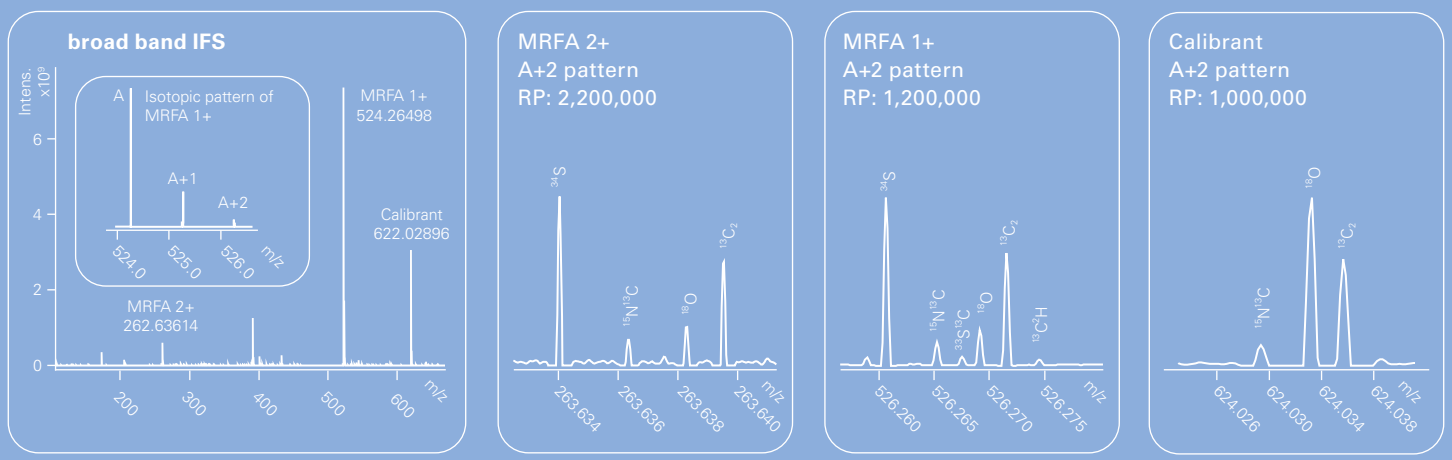
MRMS

Innovation with Integrity

Taking science to the max

Remarkable advances have been made in life sciences research using the advanced capabilities of the versatile solariX platform. Now imagine if this enabling technology was made smaller and maintenance-free when it came to liquid cryogens, so that it could fit in a standard laboratory.

scimaX allows you to dramatically improve your productivity by operating around the clock by doing your ESI experiments during the day and acquiring MALDI imaging data when you go home. Take on projects that demand exceptional scientific insight and breakthrough with scimaX.

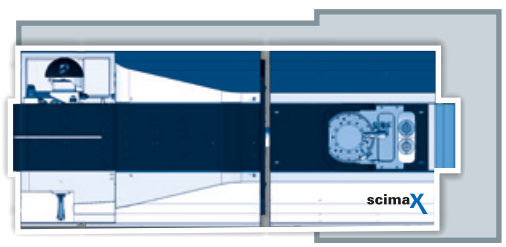


A maximum resolving power of > 20,000,000 without the need for operational cryogen fills, ever!

Solve difficult problems in science and capture the "high hanging fruit." When you want the ultimate extreme performance, with advanced versatility, the only choice is scimaX.

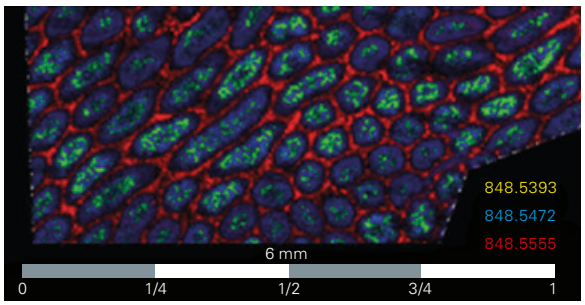
- Featuring an integrated 7T conduction cooled magnet, scimaX is small and fits in a standard lab
- Liquid helium filling and quench line not required
- Includes MALDI and ESI with no switching required
- Continuous Accumulation of Selected Ions (CASI) for enhanced sensitivity
- Choice of 8 fragmentation techniques

Footprint: scimaX and solariX

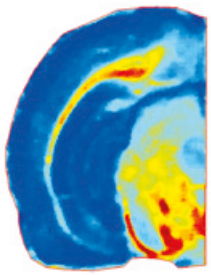


eXtreme Resolution MALDI Imaging powers new discoveries

scimaX is the ultimate MALDI imaging system for analyzing small to medium molecules, m/z 100-1,500. Its unrivaled eXtreme Resolution capability and sub-ppm mass accuracy, over a wide mass range, can differentiate images that are only mDa apart and are prerequisite for Isotopic Fine Structure (IFS) analysis and molecular formula confirmation.



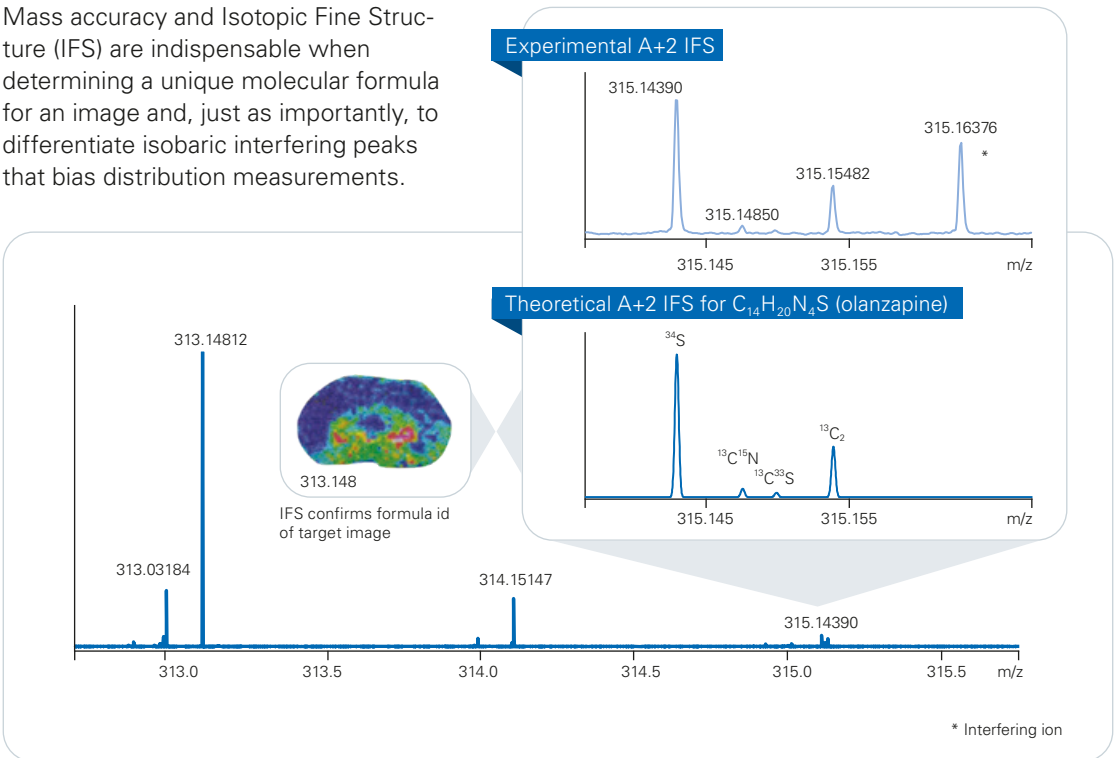
Realize the full benefit of eXtreme Resolution imaging. In the 3-color image, above, the distribution of 3 ions that have a nominal m/z of 848 and differing by only 16 mDa are spatially differentiated.



50 µm image pitch
> 22,000 pixels
< 7 hr to acquire
> 800,000 resolution
@ m/z 200

scimaX Imaging of a rat brain with standard 2xR detection provides fast imaging speed while retaining eXtreme mass resolution.

Mass accuracy and Isotopic Fine Structure (IFS) are indispensable when determining a unique molecular formula for an image and, just as importantly, to differentiate isobaric interfering peaks that bias distribution measurements.

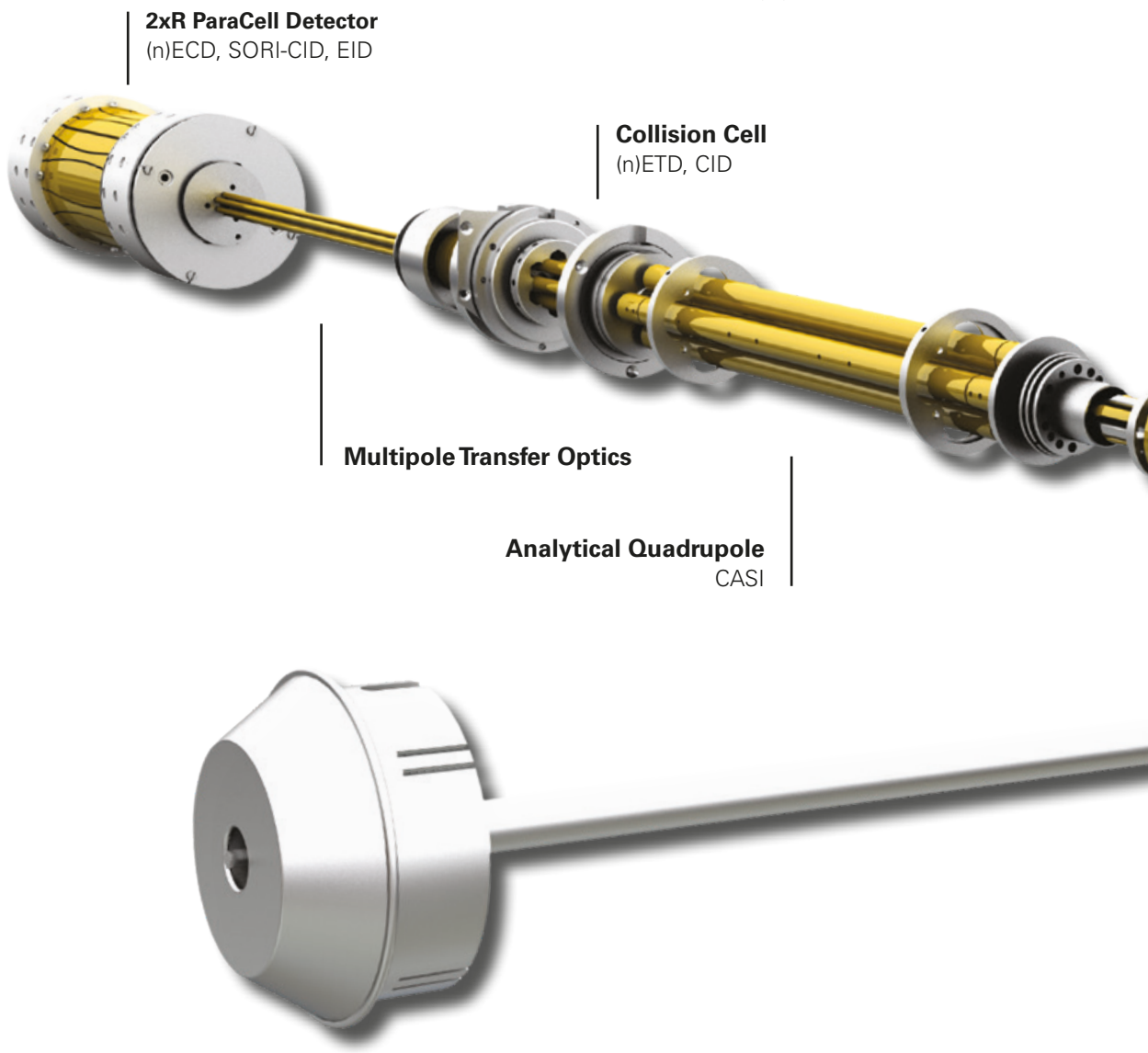


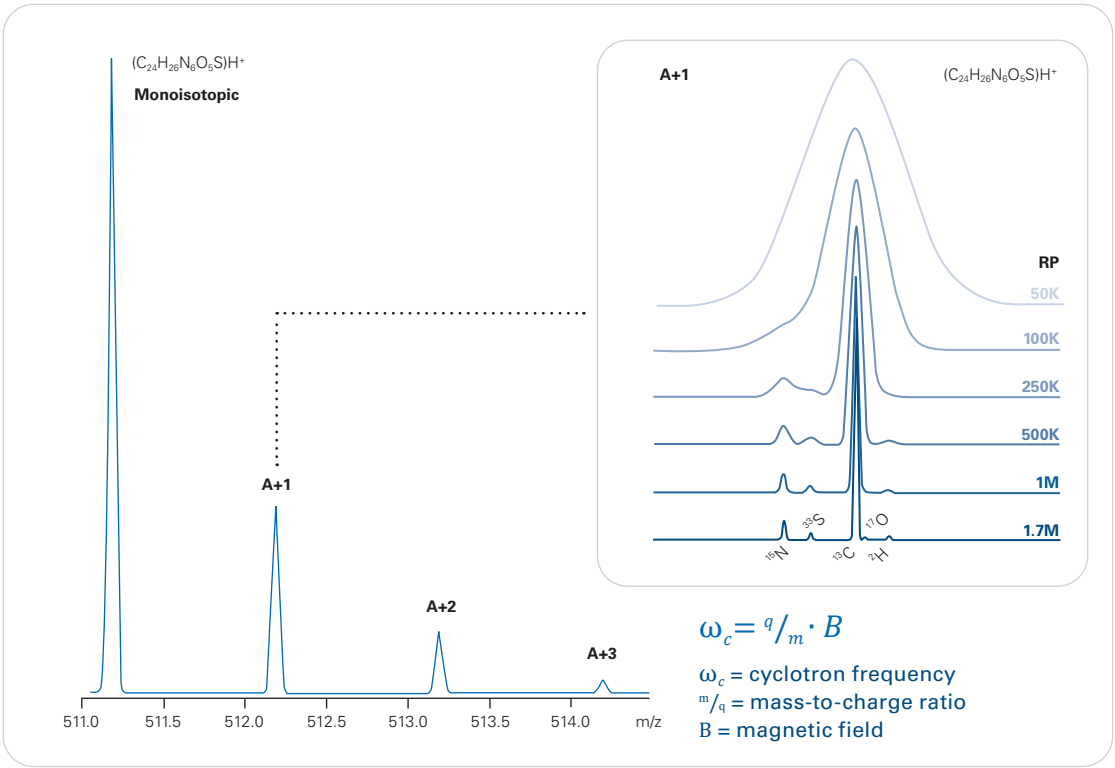
scimaX - powered by MRMS technology

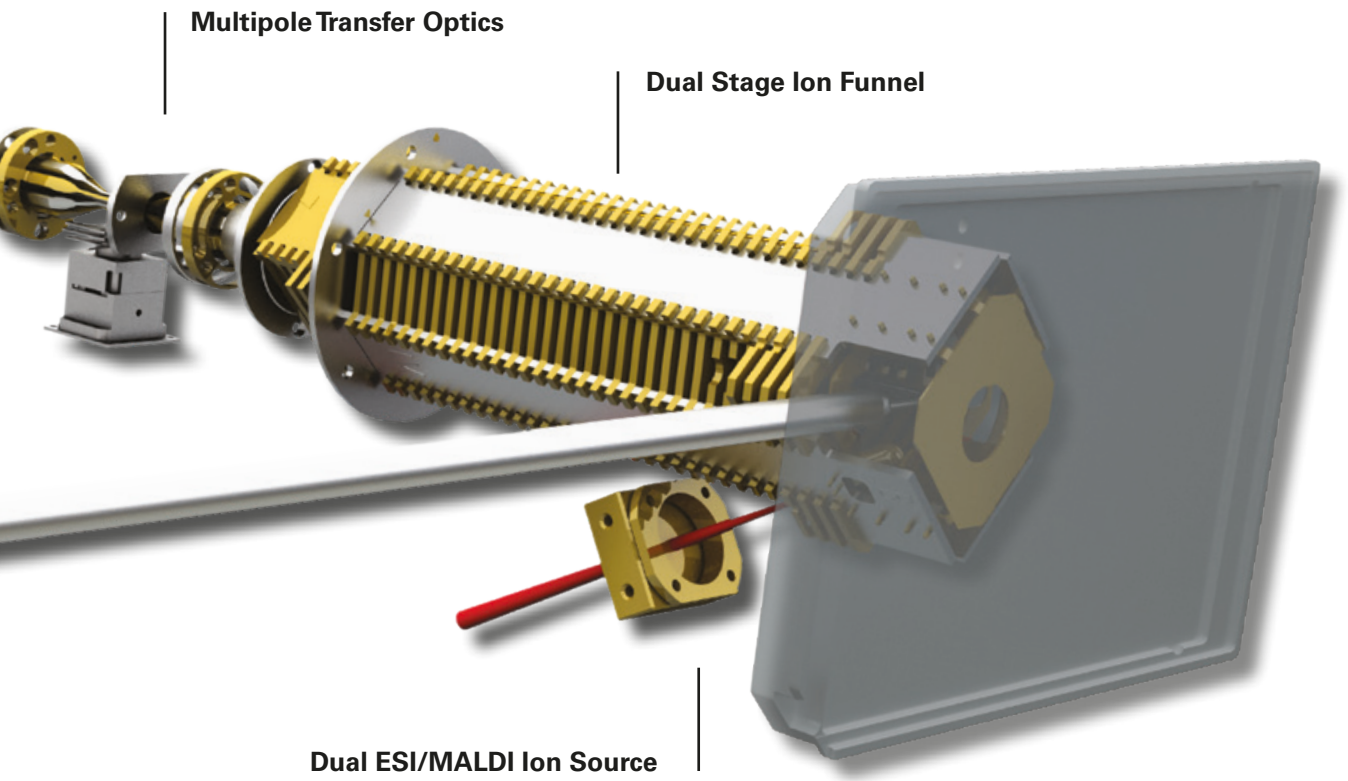
Isotope	mass (Da)	abundance(%)
^{1}H	1.007825	99.9885
^{2}H	2.014102	0.0115
^{12}C	12.000000	98.9300
^{13}C	13.003355	1.0700
^{14}N	14.003074	99.6360
^{15}N	15.000109	0.3640
^{16}O	15.994915	99.7570
^{17}O	16.999132	0.0380
^{18}O	17.999161	0.2050

Isotope	mass (Da)	abundance(%)
^{32}S	31.972071	94.9900
^{33}S	32.971459	0.7500
^{34}S	33.967867	4.2500
^{36}S	35.967081	0.0100
^{35}Cl	34.968853	75.7600
^{37}Cl	36.965903	24.2200
^{39}K	38.963707	93.2581
^{40}K	39.963998	0.0117
^{41}K	40.961826	6.7302

$m(e^-) = 0.000549$ Da




$(C_{24}H_{26}N_6O_5S)H^+$
Monoisotopic
A+1
A+2
A+3
511.0
511.5
512.0
512.5
513.0
513.5
514.0
m/z
A+1
$(C_{24}H_{26}N_6O_5S)H^+$
RP
50K
100K
250K
500K
1M
1.7M
^{15}N
^{33}S
^{13}C
^{17}O
^{2}H
$\omega_c = {}^{q}/_{m} \cdot B$
ω_c = cyclotron frequency
$^{m}/_{q}$ = mass-to-charge ratio
B = magnetic field


Multipole Transfer Optics
Dual Stage Ion Funnel
Dual ESI/MALDI Ion Source

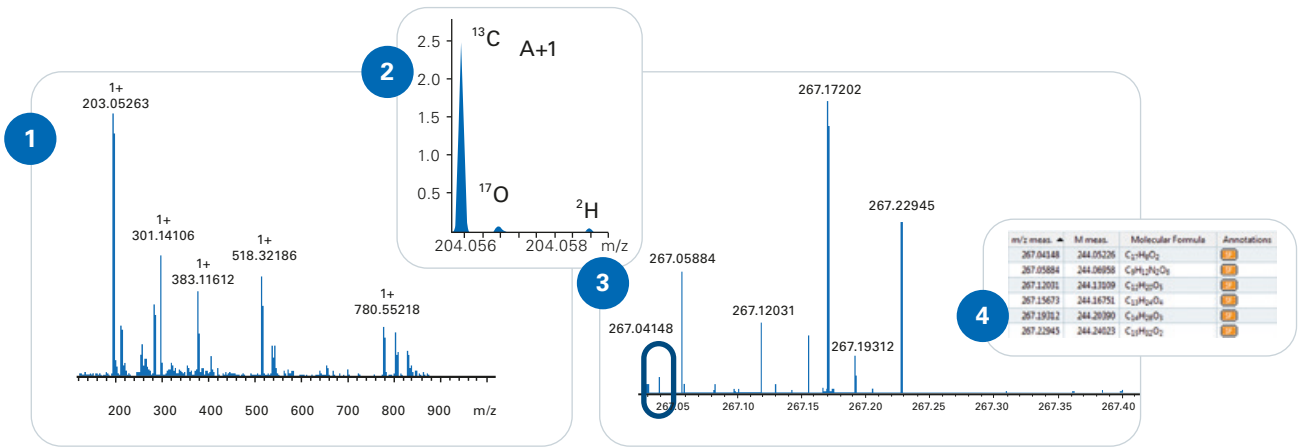
MRMS aXelerate – high throughput with unmatched specificity for Phenomics research

- Accelerate sample throughput enabling large cohort and longitudinal studies in phenomics research (> 200 samples/ day)
- Simultaneous analysis of known and unknown metabolites
- Access compounds not readily detectable by LC-MS analysis

Whether Metabolomics, Phenomics or any other complex sample analysis, large scale sample evaluation is now possible as MRMS aXelerate utilizes the eXtreme resolving power of the scimaX MRMS and **MetaboScape 4.0** to enable a powerful LC free solution.

eXtreme Resolution (XR) allows for direct sample analysis enabling true high sample throughput complementary to established NMR based solutions. From the largest unknown to the smallest, MRMS **aXelerate** incorporates a combination of ultra-high mass accuracy, True Isotopic Pattern, and Isotopic Fine Structure, allowing confident assignments of molecular formulae at any level.

Flow Injection Analysis (FIA) or MALDI based workflows provide access to compounds not readily detectable by LC-MS and provide high information content across a wide dynamic range.



1

Highest abundant compound annotated as: $C_6H_{12}O_6Na$
mass accuracy: 0.09 ppm
RP: 1,500,000

2

Expanded A+1 region of $C_6H_{12}O_6Na$ reveals Isotopic Fine Structure for this compound. Such hexose sugars are not well retained on reversed phase LC-MS and difficult to detect.

3

Low intensity ion with 1.1 x 10^6 vs. highest abundant peak with 3.7 x 10^9 intensity demonstrate > 3 order dynamic range.

4

Mass region zoom: 267.00 – 267.40 m/z. This 0.4 Da mass region exemplifies the richness of information in FIA-MRMS data: 6 species annotated.

scimaX

scimaX is easy to site and maintain
Fits in a standard lab, no quench line needed, no filling of liquid helium needed

scimaX is an integrated and versatile instrument
ESI and MALDI sources are standard and compatible with various API sources (APPI, APCI, GC-APCI) and includes several ion activation techniques (CID, (n)ETD, (n)ECD, EID, SORI-CID, MALDI-ISD)

scimaX brings "high hanging fruit" within reach …
… for various applications like MALDI Imaging, Phenomics, Petroleomics, and more

scimaX enables identification with confidence
Routine sub-ppm mass accuracy and Isotopic Fine Structure (IFS) capability enable high-confidence molecular formula assignments for known and unknown targets

Professor Evgeny Nikolaev, ParaCell Inventor, Skoltech, Moscow

"With scimaX, Bruker continues innovation of MRMS technology to reduce effort while increasing scientific output. scimaX' core detection technology, the 2xR ParaCell, provides uncommon broadband ion stability and mitigates ion cloud coalescence resulting in mass resolution orders of magnitude above other detection schemes. This enables extreme resolving power over a broad mass range needed to perform isotopic fine structure analysis of complex mixtures ."

US7315020B2, GB2402261B, US7064321B2, DE10213652B4, GB2390937B, US6803569B2, DE102009050039B4, US8704173B2, US8859953B2, US8766174B1, DE102014226498B4, US9620349B2, EP2858090B1, US9355830B2, US9111735B1

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