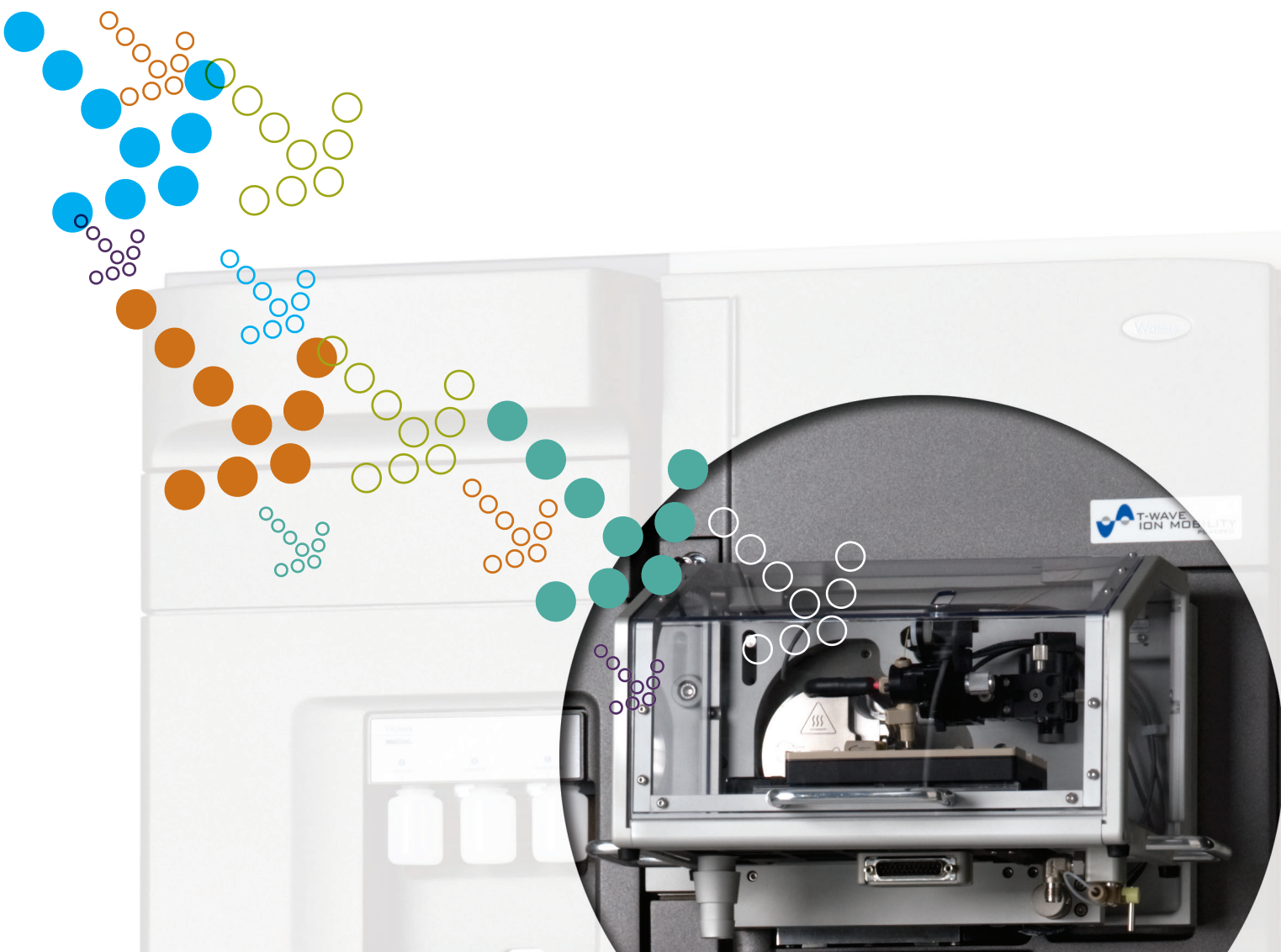


[ MS IMAGING ]




# FULL SPECTRUM MOLECULAR IMAGING

COMPLETE VISUALIZATION OF MOLECULAR DISTRIBUTIONS

SYNAPT G2-S

**Waters**  
THE SCIENCE OF WHAT'S POSSIBLE.®



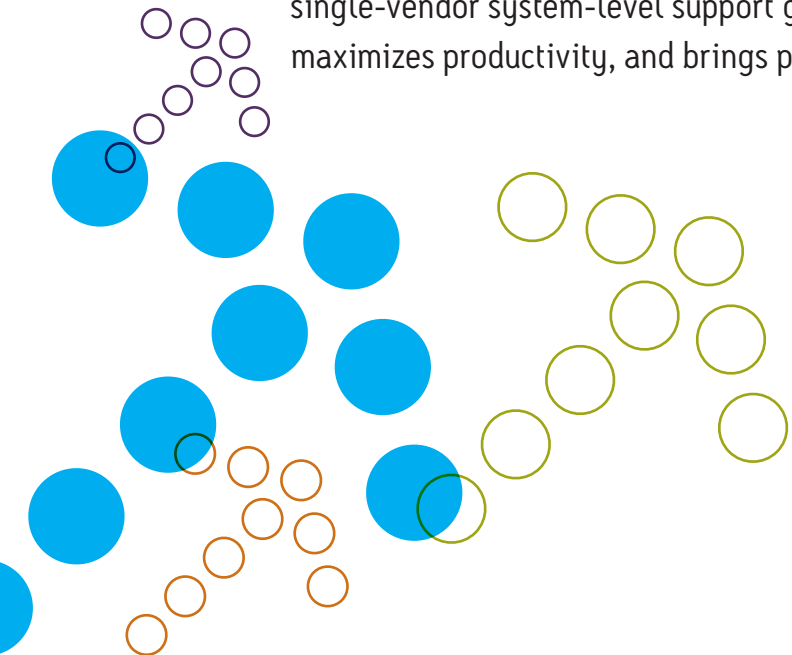
THE SPATIAL DISTRIBUTION OF MOLECULES,  
DETERMINED BY MS IMAGING, CAN PROVIDE A  
WEALTH OF INFORMATION REGARDING BIOLOGICAL,  
PHYSIOLOGICAL, AND CHEMICAL FEATURES  
AND PROCESSES.

**Waters Full Spectrum Molecular Imaging** represents a combination of advanced Mass Spectrometry (MS) imaging technologies, designed to deliver high quality, comprehensive, spatially resolved molecular information across a variety of application areas and with the minimum of time and effort.

Confidence is assured through the coupling of high performance ion mobility separation with high resolution MS, while a choice of complementary ionization techniques provides flexibility and delivers multi-layered, information-rich data from a single sample.

This provides a more complete and comprehensive picture of the sample, through mapping the distributions of a variety of molecule types including small molecules, drugs and metabolites, lipids, and peptides.

An intuitive, fully integrated workflow translates complex samples into meaningful answers faster and easier than ever before, while single-vendor system-level support guarantees compatibility, maximizes productivity, and brings peace of mind for the future.

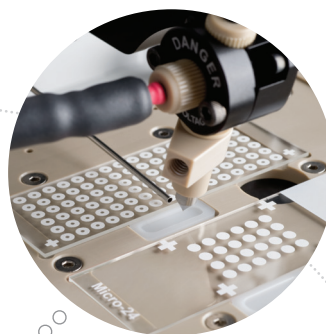


## BRINGING TOGETHER POWERFUL TECHNOLOGIES IN A SINGLE SYSTEM



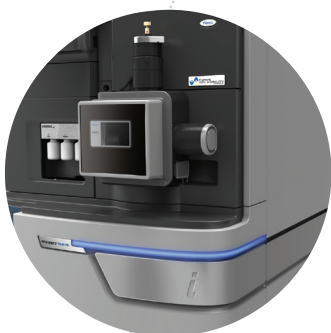
### MALDI\* IMAGING

- Excellent spatial resolution
- Wide variety of applications
- Well established MS imaging approach



### DESI† IMAGING

- Minimal sample preparation
- Excels at lipid and small molecule imaging
- Enables multiple imaging experiments on the same sample



### SYNAPT G2-Si HDMS+

- Enhanced selectivity with unique ion mobility separation
- Proven robustness and reliability
- Superior performance for low molecular weight compounds
- Highly efficient fragmentation by low energy collision induced dissociation (CID)
- Performance unaffected by variations in sample surface topography



### FULL SPECTRUM MOLECULAR IMAGING

- Discover, identify and measure a broad range of molecular targets with one system
- Obtain more comprehensive, detailed information than from any individual imaging technique
- Extract the maximum amount of information from minimal sample
- Definitively and objectively interpret molecular distribution information
- Flexibility to adapt to changing priorities and future needs
- Single vendor for total system support



### HDI IMAGING SOFTWARE

- Intuitive, integrated software suite covering the full MS imaging workflow
- Makes effective use of both mass spectral and ion mobility data
- Optical image overlay to merge molecular and morphological information

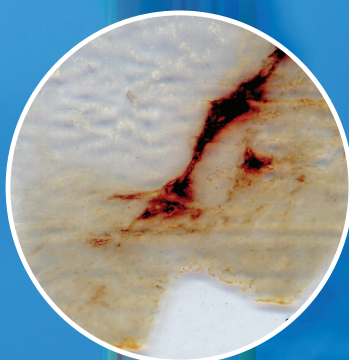
\*MALDI: Matrix Assisted Laser Desorption Ionization. †DESI: Desorption Electrospray Ionization. †DESI is also supported on Xevo® G2-XS QToF.

# MULTIPLE IMAGING EXPERIMENTS WITH THE SAME SAMPLE

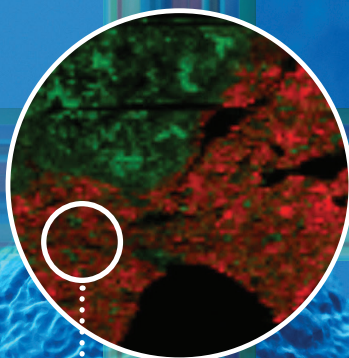
Many applications demand the maximum amount of information from the minimum of sample. The non-destructive nature of DESI means that a single tissue section can be analyzed multiple times, for example at different spatial resolutions or using different polarities, without significant degradation of signal or modification of chemical signature. Following multiple DESI analyses, the same tissue section can then be used for either histological staining (see DESI-Staining Workflow) or analysis by MALDI MS imaging (see DESI-MALDI workflow).

## DESI – STAINING WORKFLOW<sup>1</sup>

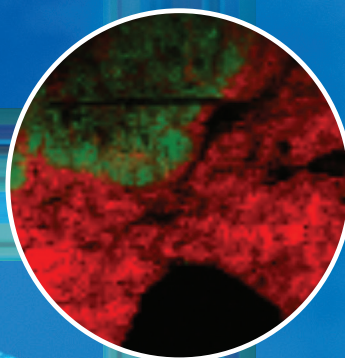
Tissue Section



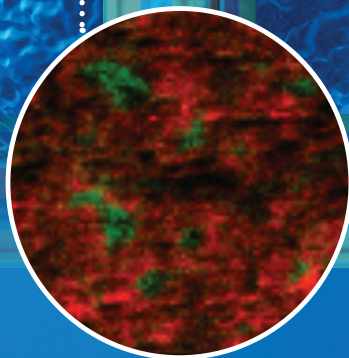
DESI-MS Image  
Negative ion mode  
200 µm pixel size



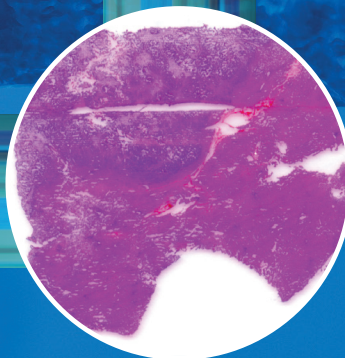
DESI-MS Image  
Positive ion mode  
200 µm pixel size



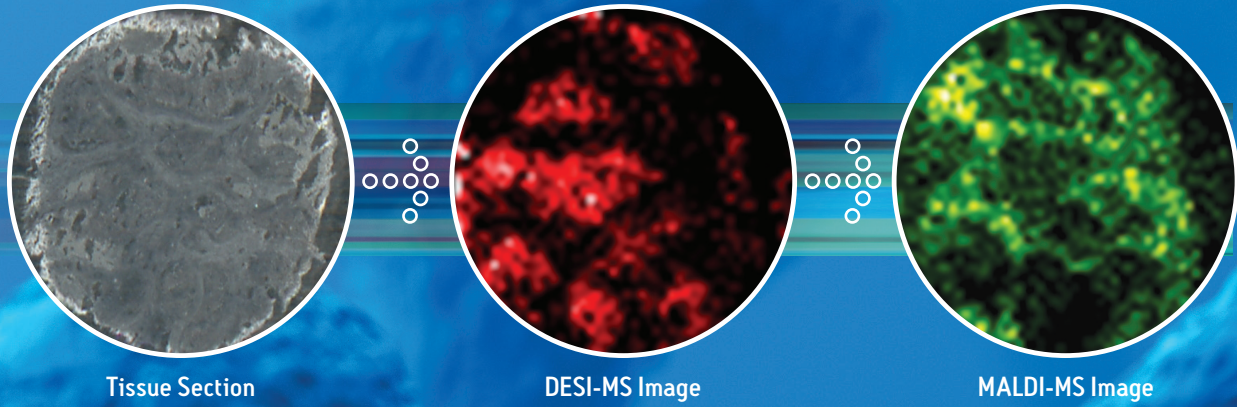
DESI-MS Image  
Negative ion mode  
50 µm pixel size



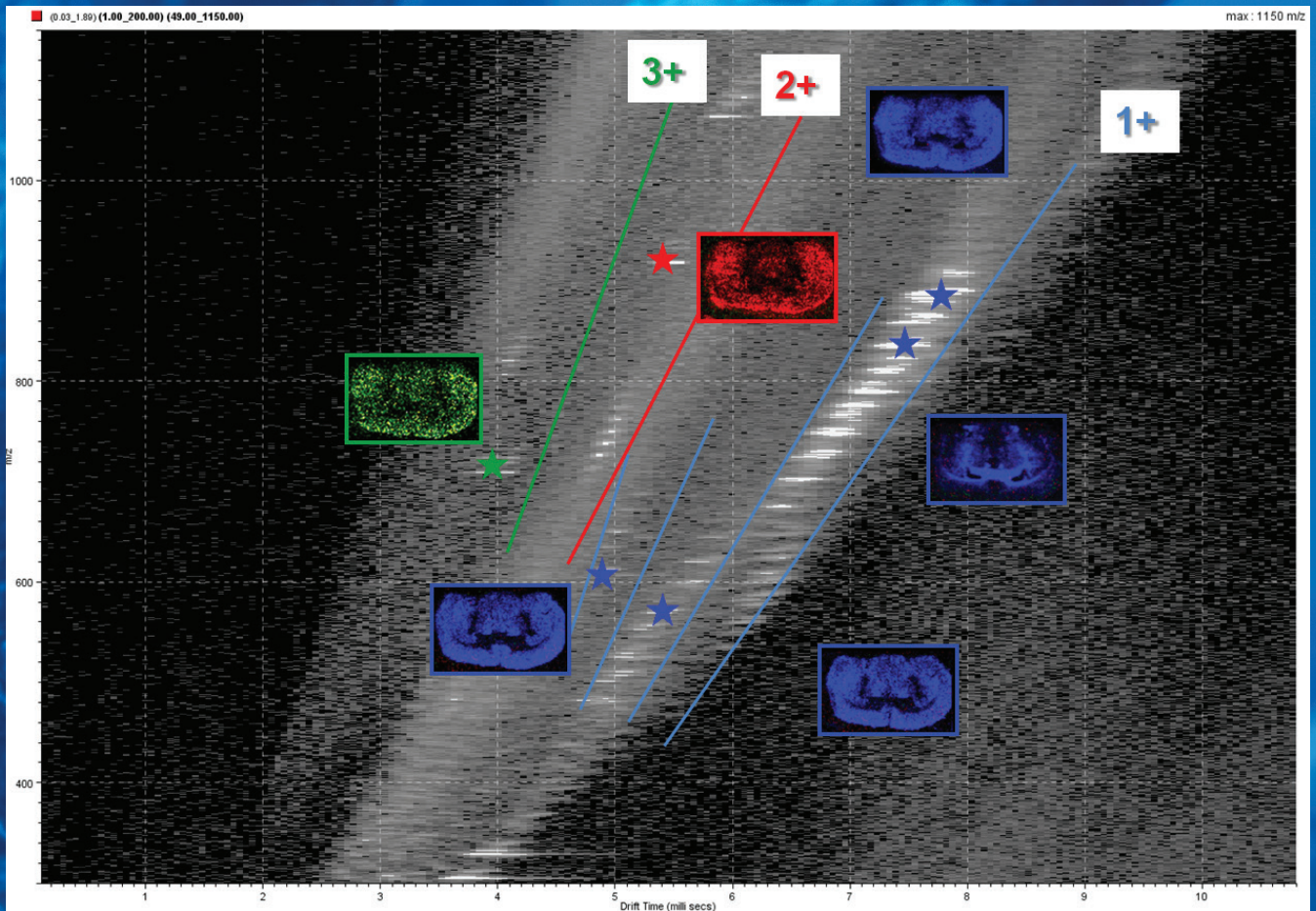
Tissue section after  
Hematoxylin and  
Eosin (H&E) staining



## DESI – MALDI WORKFLOW<sup>1</sup>



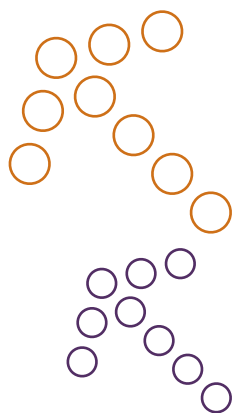
## COMBINE MS IMAGING WITH THE POWER OF ION MOBILITY<sup>2</sup>



Ion mobility allows the gas phase separation of ions by compound class and charge in an MS imaging experiment.

## SALES OFFICES:

Australia 61 2 9933 1777  
Austria 43 1 877 18 07  
Belgium and Luxembourg 32 2 726 1000  
Brazil 55 11 4134 3788  
Canada 1 800 252 4752  
China 86 21 6156 2666  
Czech Republic 420 2 617 11384  
Denmark 45 46 59 8080  
Finland 358 9 5659 6288  
France 33 1 30 48 72 00  
Germany 49 6196 400 600  
Hong Kong 852 2964 1800  
Hungary 36 1 350 5086  
India 91 080 49292200 03  
Ireland 353 1 448 1500  
Israel 9723 3731391  
Italy 39 02 265 0983  
Japan 81 3 3471 7191  
Korea 82 2 6300 9200  
Mexico 52 55 52 00 1860  
The Netherlands 31 76 508 7200  
Norway 47 6 384 6050  
Poland 48 22 101 5900  
Portugal 351 21 893 61 77  
Puerto Rico 1 787 747 8445  
Russia/CIS 7 495 727 4490 / 290 9737  
Singapore 65 6593 7100  
Spain 34 93 600 9300  
Sweden 46 8 555 115 00  
Switzerland 41 56 676 7000  
Taiwan 886 2 2501 9928  
UAE 971 4 214 62 38  
UK 44 208 238 6100  
US 1 800 252 4752



## Acknowledgements

1. Study carried out in conjunction with Imperial College London. For the analysis of human samples, ethical approval was obtained from the National Research Ethics Service (NRES) Committee London – South East (Study ID 11/LO/0686). This work was supported by European Research Council under Starting Grant Scheme (Grant Agreement No: 210356) and the European Commission FP7 Intelligent Surgical Device project (contract no. 3054940).
2. Mouse brain sample provided by Prof. Ron M.A Heeren and Karolina Skraskova, Maastricht University.



[www.waters.com/MSimaging](http://www.waters.com/MSimaging)

# Waters

THE SCIENCE OF WHAT'S POSSIBLE.®

## Waters Corporation

34 Maple Street  
Milford, MA 01757 U.S.A.  
T: 508 478 2000  
F: 508 872 1990  
[www.waters.com](http://www.waters.com)

Waters, The Science of What's Possible, SYNAPT, HDI, and Xevo are registered trademarks of Waters Corporation. All other trademarks are the property of their respective owners.

©2015 Waters Corporation. Printed/Produced in the U.S.A.  
February 2015 720005318EN TC-SIG