BIOANALYSIS ZONE | Spotlight

LC-MS

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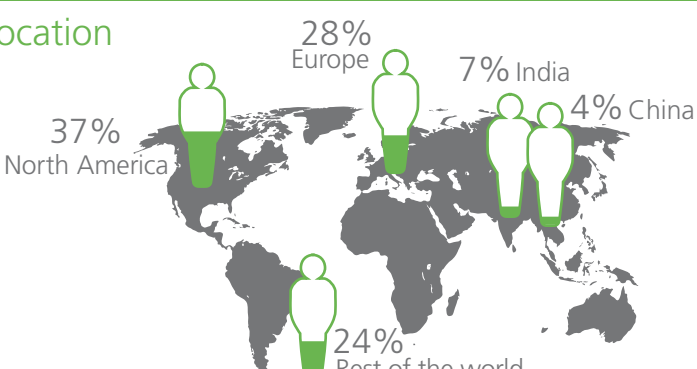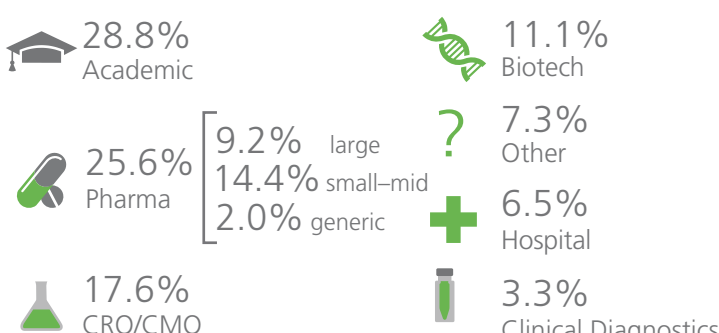
LC-MS is used in the pharmaceutical industry to provide quantitative measurements of an active drug and its metabolites to generate accurate PK/PD, toxicokinetic and bioequivalence data, which are fundamental to the drug development process. The technique is also used for the analysis of biological matrices in a number of other fields (e.g., sports doping, forensic toxicology). LC-MS is currently the 'go to' method for small molecule bioanalysis due to its sensitivity, selectivity, dynamic range and robustness. It is also increasingly being used for the analysis of biopharmaceuticals. LC-MS analysis is constantly developing alongside technological advancements such as HRMS, microflow LC and DBS. We carried out a survey to uncover how you use this technique, and to find out your views on the future of LC-MS.
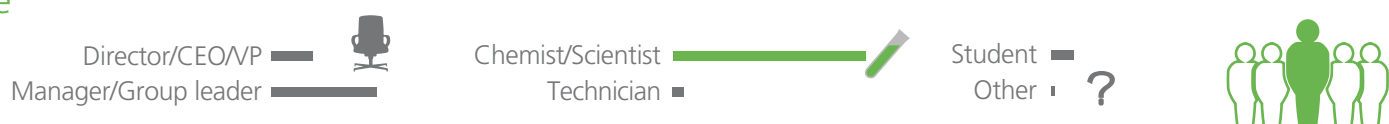
About the respondents

Location

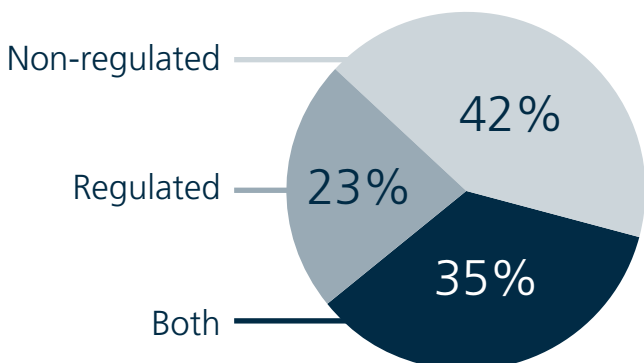37% North America
28% Europe
7% India
4% China
24% Rest of the world

Employer

28.8% Academic
25.6% Pharma
  9.2% large
  14.4% small–mid
  2.0% generic
17.6% CRO/CMO
11.1% Biotech
7.3% Other
6.5% Hospital
3.3% Clinical Diagnostics

Role

Director/CEO/VP
Manager/Group leader
Chemist/Scientist
Technician
Student
Other

LC-MS in your laboratory

In which fields do you use LC-MS?

Clinical 40.9%
Pharmaceutical 68.9%
Forensic 17.1%
Sports doping 3%
Other 18.3%

Is your LC-MS work:

Non-regulated 42%
Regulated 23%
Both 35%

Which of the following chromatography techniques do you use?

HPLC 78.7%
LPLC 1.8%
SFC 6.1%
UHPLC 72.6%
Other 4.3%
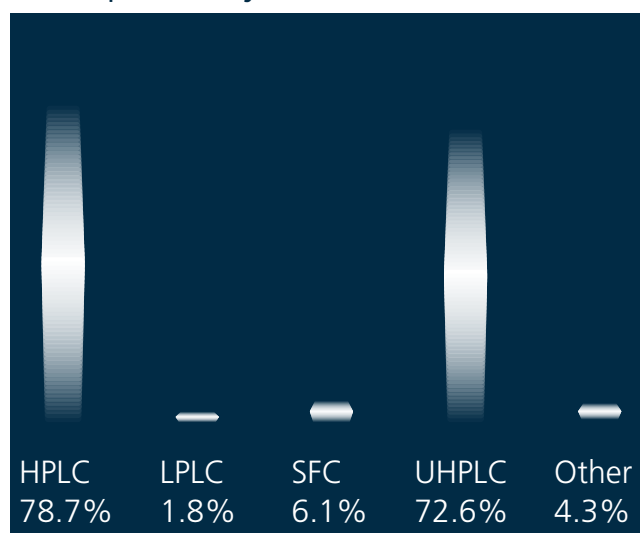
Which of the following MS technologies do you use?

Fourier-transform HRMS | Ion trap MS | Orbitrap MS | QTOF MS | Single quadrupole MS | Triple quadrupole MS | TOF MS | Other
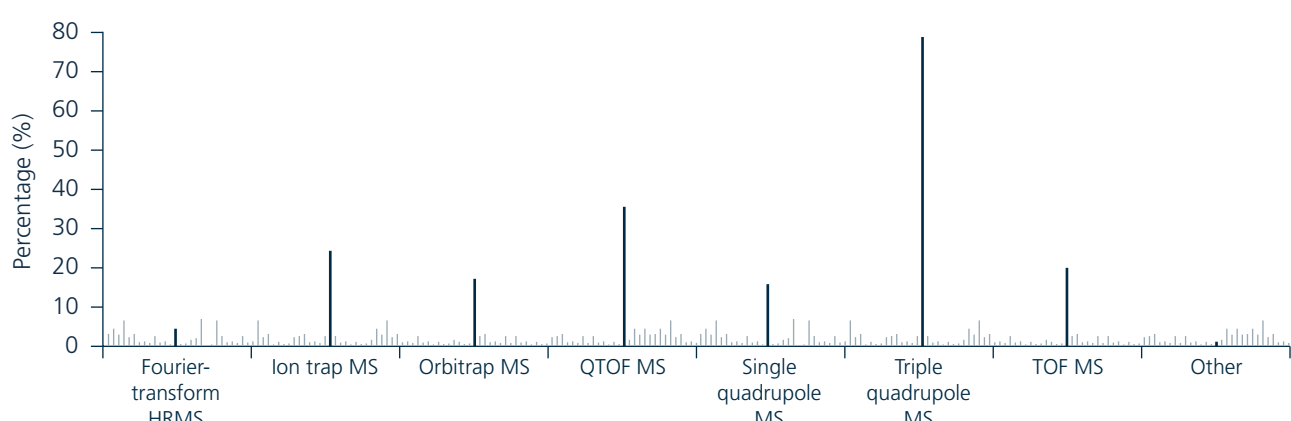
Do you use generic LC-MS methods?

Yes 33%
No 67%
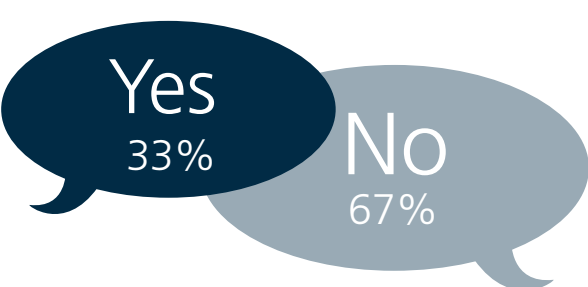
What are the top 3 challenges of LC-MS assays?

1 Ion suppression/enhancement Sensitivity
2 Interfering peaks
3 Data storage, analysis and reporting
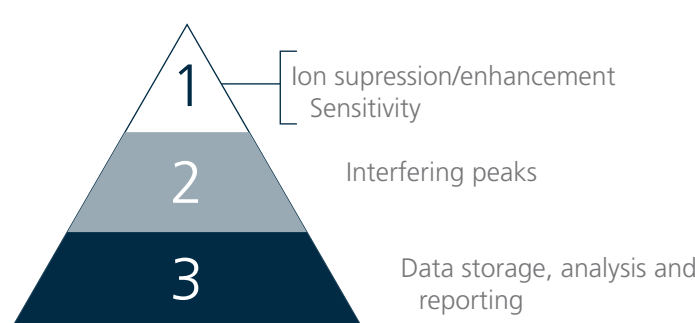
Analytes and matrices

What type of analysis do you use LC-MS for?

Quantitative - Small molecule analysis 82.7%
Qualitative - Small molecule analysis 46.2%
Quantitative - Large molecule analysis 35.3%
Qualitative - Large molecule analysis 26.3%
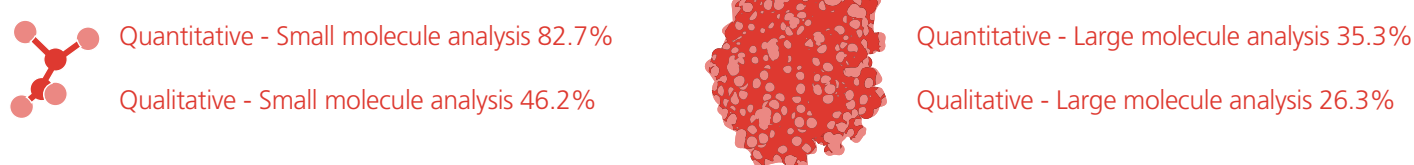
Which matrices do you work with?

CSF 34.6%
Diluted whole blood 24.2%
Dried blood spots 26.8%
Feces 13.7%
Plasma 71.9%
Serum 56.2%
Urine 58.2%
Whole blood 37.9%
Tissue 9.2%
Saliva 5.2%
Other 16.3%
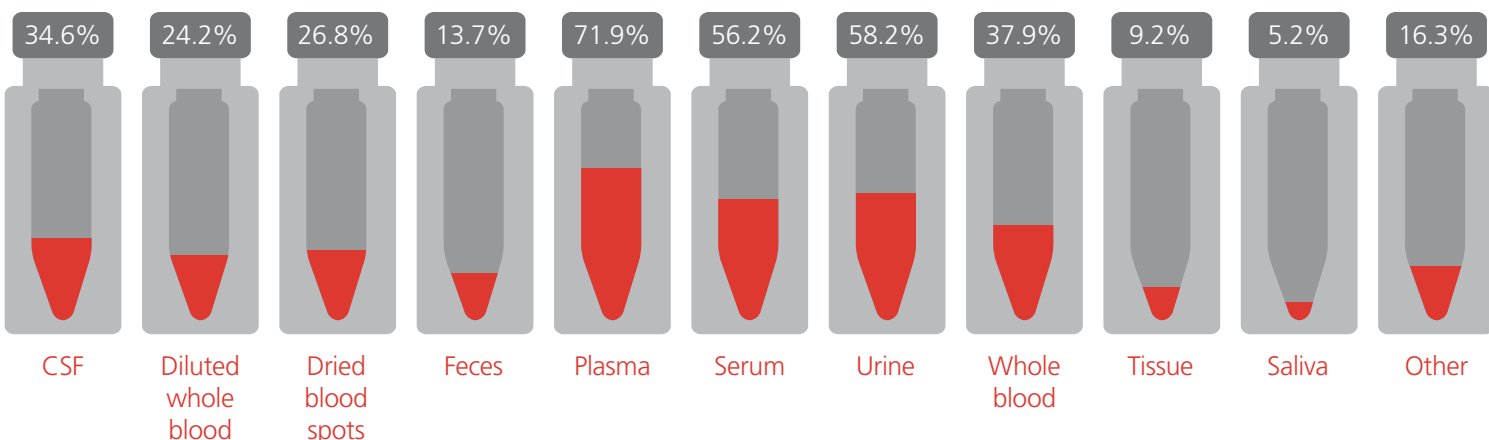
Future of LC-MS

Do you believe...

LC-MS will replace LBA for large molecule analysis
Not sure 23%
LC-MS will be used as a complimentary platform to LBA 44%
LBA will remain the gold standard for large molecule analysis 30%
3%
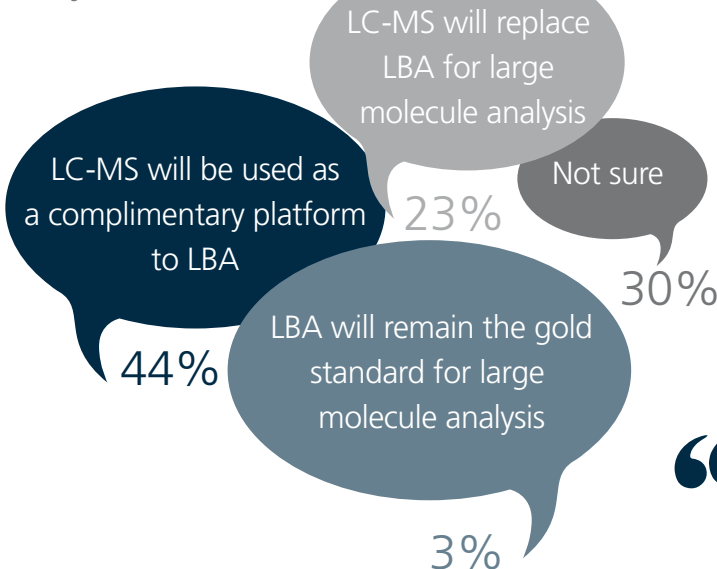
Do you believe the use of low flow LC (micro and nano flow) will continue to increase?

36% Yes, a lot
43% Yes, a little
6% No
15% Not sure

> I can see the possibility of micro flow LC-MS being used more for small molecule analysis in the future. That's assuming there are improvements in sensitivity over current flow rates in the 0.2–0.4 mL/min range without tradeoffs regarding precision and accuracy in quantitation.
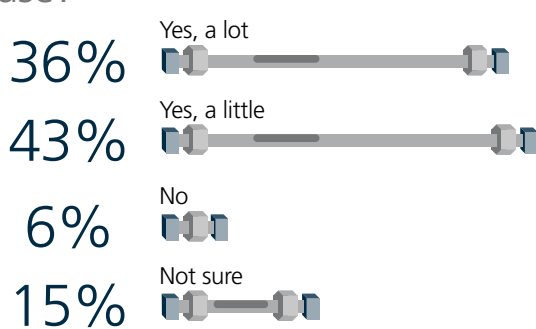
What are your predictions for the future of LC-MS?

> Instruments should get smaller, easier to use and more sensitive. However, all should remember that LC-MS by its nature is more data rich than LBA, therefore data will always take longer to analyze and interpret.

> The use of HRMS will continue to grow. Instrument sensitivity will also improve, which will allow smaller sample sizes to be used, more analytes to be included in a single method, and improved throughput due to the requirement of less sample prep.