Making the most of vendor visits and discussions with colleagues

MSACL US 2018
Palm Springs, CA

Wednesday, January 24th

Deborah French Ph.D., DABCC, FACB
University of California San Francisco
Learning Objectives

After this presentation, you should be able to:

- Describe questions that should be asked of vendors and colleagues when choosing a mass spectrometer
Overview

- questions to ask vendors
- questions to ask colleagues
- have vendors test actual samples
- site visit to vendors
- selection of vendor
Questions to ask vendors

- request for proposals (RFP) - your institution may already have one
- cover all aspects of instrument requirements

Audience Question:

What physical requirements can you think of?
Questions to ask vendors (cont)

- request for proposals (RFP) - your institution may already have one
- cover all aspects of instrument requirements
  - dimensions of instrument
  - venting,
  - electrical requirements,
  - software, hardware (mass spectrometer)
  - liquid chromatography system (pumps, autosampler, column oven, degasser)
  - universal power supply (UPS)
  - nitrogen supply (with or without separate air compressor)
  - service availability
  - interface with laboratory information system
  - training
Questions to ask vendors (cont)

- request for proposals (RFP) (cont)

- cover all aspects of instrument specifications
  - mass range
  - ionization options
  - scan rate
  - minimum dwell time
  - speed of positive/negative polarity switching
Questions to ask vendors (cont)

- Sensitivity of available instruments for analytes of interest
- Specificity of available instruments for analytes of interest
- Availability and cost of training
  - Is any training included in purchase price of instrument?
- Speak with engineer who will install instrument in your laboratory
  - Have them come for a site visit if possible
- Contact information for clinical laboratories already using their instrumentation
Questions to ask colleagues

- ease of use
  - software particularly
- maintenance schedule
- instrument downtime
- if colleague is in your geographical area
  - service availability - how quickly does an engineer arrive on site once service call has been placed
  - how responsive is the sales representative?
Unbiased evaluation of each instrument

- design an experimental set of samples that can be sent to each vendor under consideration

- unbiased evaluation of instruments for analytes you want to measure

- choose or make clinically relevant samples
  - patient samples, or spiked samples, or multi-analyte samples or samples with different analyte concentrations

- carry out sample preparation in the same way for each set
Unbiased evaluation of each instrument (cont)

- provide solutions for optimization of mass spec

- provide a column and detailed HPLC protocol
  - include mobile phase composition, gradient and injection volume

- provide the transitions to be monitored
  - can be found in the literature

- ask for the specific data so you can compare
  - (e.g. peak areas, signal to noise ratio, chromatograms etc)

(Laha, Henderson and Hoofnagle, Judging a book by its data: Planning experiments to fully evaluate prospective instrument vendors, poster presentation, MSACL 2016)
Site visits to vendors

- have vendor walk through daily, weekly, monthly maintenance
- possible to have different users with different privileges?
- how many samples fit in autosampler - do you need to use vials and/or plates?
- develop a data acquisition method and use it
  - set up a run
- develop data analysis method and use it
  - analyze data from the run
Selection of vendor

- hardest decision you will have to make!
- compare instrument requirements/specifications (from RFP)
- compare results from patient and other samples
- most important features to compare
  - performance for current and future analytes of interest
  - reliability of instrument
  - service availability and responsiveness
  - availability of training in method development skills
  - responsiveness of sales representative
### Audience exercise

<table>
<thead>
<tr>
<th>2 µg/mL</th>
<th>Vendor A</th>
<th>Vendor B</th>
<th>Vendor C</th>
<th>Vendor D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voriconazole</td>
<td>3.2%</td>
<td>3.5%</td>
<td>2.9%</td>
<td>3.6%</td>
</tr>
<tr>
<td>Posaconazole</td>
<td>2.6%</td>
<td>3.2%</td>
<td>3.3%</td>
<td>3.5%</td>
</tr>
<tr>
<td>Fluconazole</td>
<td>2.5%</td>
<td>3.3%</td>
<td>3.0%</td>
<td>3.4%</td>
</tr>
</tbody>
</table>

- peak area imprecision of 10 independent extractions of serum in the same batch containing three antifungals

**Question:** Which instrument would you pick?
Audience exercise

- chromatograms of extracted serum samples containing 2 ng/dL testosterone

Question: Which instrument would you pick?
Decision making

- how you feel during decision making process
- how you feel after you make a decision
Conclusions

- make a list of what your laboratory needs ahead of time with regards to sensitivity, robustness, throughput etc
- ask all vendors the same questions concerning instrument requirements and specifications
- give all vendors the same samples to run
- rank each instrument based on what is most important to you
- you will find that each system has pros and cons that are comparable
- hardest decision you will have to make!
References/Resources

- Clinical and Laboratory Standards Institute (CLSI). *Mass Spectrometry in the Clinical Laboratory: General Principles and Guidance; Approved Guideline*. CLSI document C50-A
- French D, Terrazas E. The successful implementation of a licensed data management interface between a Sunquest laboratory information system and an AB SCIEX mass spectrometer. *J. Pathol. Inform.* 2013. 4:1
- [https://www.aacc.org/publications/cln/articles/2015/february/implementing-mass-spec-part-one](https://www.aacc.org/publications/cln/articles/2015/february/implementing-mass-spec-part-one)
- [https://www.aacc.org/publications/cln/articles/2015/may/implementing-mass-spectrometry-in-the-clinical-lab](https://www.aacc.org/publications/cln/articles/2015/may/implementing-mass-spectrometry-in-the-clinical-lab)
- Laha TJ *et al*. Judging a book by it’s data: planning experiments to fully evaluate prospective instrument vendors. *MSACL 2016 poster*
Acknowledgements

Judy Stone  Rob Fitzgerald  Joe El-Khoury
Acknowledgements
Deborah French
University of California San Francisco
Email: deborah.french@ucsf.edu