2nd Workshop on Multi-User Equipment and Facilities
FAPESP
Sao Paulo

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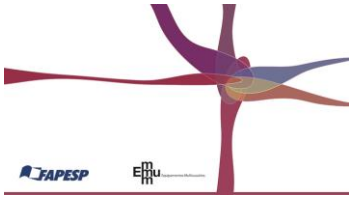

How to thrive in a Multi-User Equipment Program Environment: Lessons Learned…

Alice in Wonderland – The Red Queen's Race

"Run Twice as Fast!"

"Well, in our country," said Alice, still panting a little, "you'd generally get to somewhere else—if you run very fast for a long time, as we've been doing."

"A slow sort of country!" said the Queen. "Now, here, you see, it takes all the running you can do, to keep in the same place. If you want to get somewhere else, you must run at least twice as fast as that!"

Lewis Carroll
Isaac Asimov

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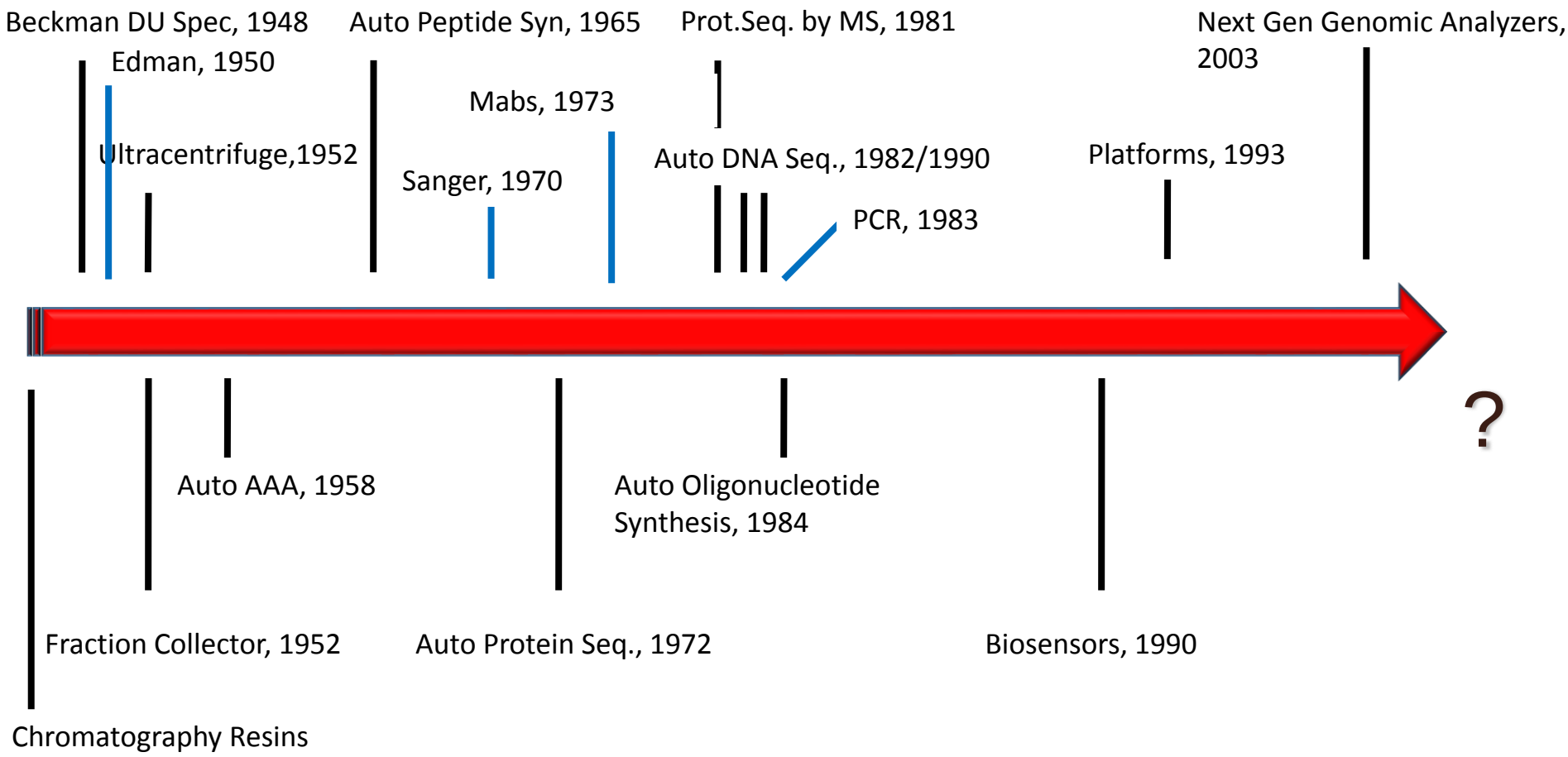
Technological Timeline in Biosciences:

The Yin and Yang of modern science



Origin of Share Resources in the United States

Driven by cost, demand, instrument complexity, and optimized use of resources by funding agencies

- Initially the demand for relatively high cost, sophisticated instruments was small and limited to scientists working closely with the instruments and their development. These included amino acid analyzers, ultracentrifuges, peptide synthesizers, protein sequencers. Late 1950's through 1960's.

- In a relatively short period of time the demand for access to these technologies by "non-experts" grew and funding agencies were reluctant to house instruments in investigators' laboratories where the instrument might not operate at optimal specifications or capacity yet the scientific need for access was clear. The goal was the democratization of technology.

- *The scientific instrumentation "Arms Race" was launched .*

Origin of Share Resources in the United States

Driven by cost, demand, instrument complexity, and optimized use of resources by funding agencies

- The first cores/shared resources were operated out of investigator's labs or in departments with little oversight, vision, or business acumen. First started to commonly appear in 1970's.
- NIH began funding shared instrumets in 1981 under strict guidelines.
- Overtime as operational constraints became stricter and pressure for no redundancy in capabilities at institutions grew stronger cores became centralized within institutions (1990's-2000's).

Key Features of Effective Cores

"It's not just the flashing lights anymore"

- Foremost is *expert staff* who are committed to client support and a sustainable business plan.
- Strong business plan that supports the sustainability of the enterprise.
- Engaged oversight/advisory support of the core.
- Close relationship with institutional administration to ensure alignment of core with institutional research aims/mission.
- Instrumentation is appropriate for the clientele it will support and aligned with instiutional research mission..

Key Features of Effective Cores

"It's not just the flashing lights anymore"

- Foremost is expert staff who are committed to client support.
  - Career track for staff in place. What are the incentives?
  - Opportunities for additional training and education (scientific, management, business) for staff.
  - Expectation that staff will remain scientifically engaged/marketable.

Shared Resources/Cores/Multi-User Instrumets

"So, you think you want to start a core"

1. Is there really a demand? Remember that the efficacy of instrument use (data and budget) is often throughput driven. *If Yes go to #2.*

2. Can the work be effectively outsourced? *If Yes go to #3. If No go to #4.*

3. Outsource unless there are strategic institutional reasons to do work internally. Use your resources for more novel things you cannot outsource……

4. So the work cannot be outsourced. Focus on that aspect. Animal, cell, tissue work is difficult to outsource. Or, you perhaps can do it better, faster, cheaper or requires in-house expertise.

5. Keep in mind nothing lasts forever; cores must evolve or be sunsetted.

Key Features of Effective Cores

"It's not just the flashing lights anymore"

- Strong business plan that supports the sustainability of the enterprise.
  - Business plans matches institutional expectation.
  - Clear mechanisms in place for instrument repair/maintenance.
  - Long term plans for instrument retirement/replacement.
  - Visioning exercises to understand scientific trends and how core will adapt to or lead these trends.

Key Features of Effective Cores

"It's not just the flashing lights anymore"

- Engaged oversight/advisory support of the core.
  - Comprised of users, experts and non-aligned faculty/stakeholders.
  - Trusted by both core staff and administration.
  - Willing to liaise with other stakeholders on behalf of the core.
  - Committee has both institutional and core interests in mind…and preferably not just their personal interests.

Key Features of Effective Cores

"It's not just the flashing lights anymore"

- Director should have close relationship with institutional administration to ensure alignment of core with institutional research aims/mission.
    - Must have have the trust of the advisory bodies and the institutional administration.
    - Must have an understanding of changing research strategies and budgetary constraints of institution.

Key Features of Effective Cores

"It's not just the flashing lights anymore"

- Appropriate instrumentation for the clientele it will support.
  - If you build it will they come?
  - What is the demand; real demand for a particular instrument or technology? What "skin" do the investigators have in the game?
  - Is the instrument sustainable…..what will its usage be?

Funding Sources in USA for Large Instrumentation:

Show me the money!

- National Institutes of Health (NIH)
- National Science Foundation (NSF)
- State Funds
- Institutional Funds
- Industrial Partnerships

ORIP

OFFICE OF RESEARCH
INFRASTRUCTURE PROGRAMS

S10 Shared Instrumentation Program

NIH National Institutes of Health
Office of Research Infrastructure Programs

The S10 Shared Instrumentation Program

- S10 Mechanism: "Biomedical Research Support Shared Instrumentation Grants"

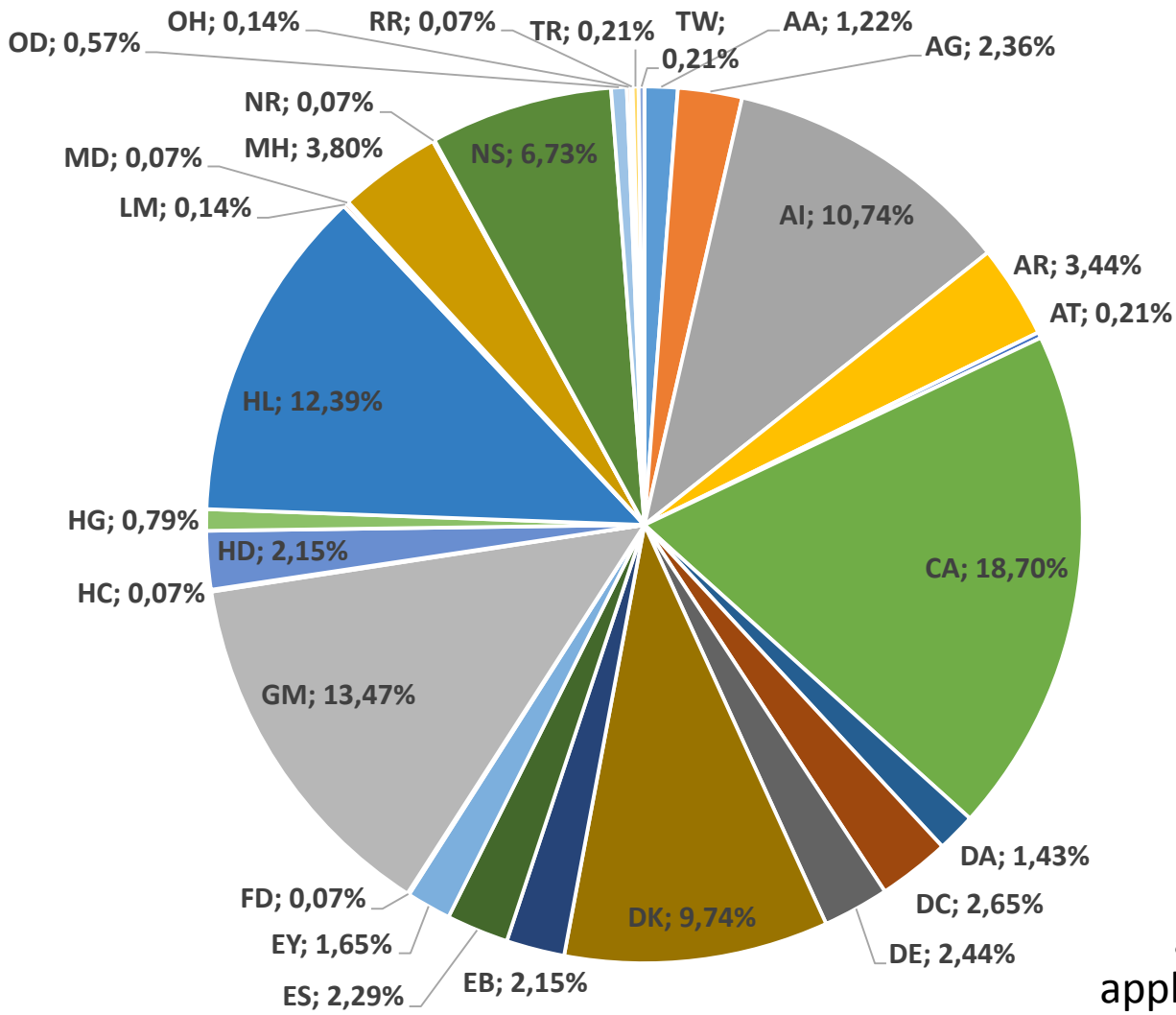
  - Used (only) by ORIP to support the Shared Instrumentation Program
  - To provide support to purchase **state-of-the art**, expensive, **commercially available** instruments to be used on a **shared basis** to **enhance research of NIH-funded investigators**.

  - Program's budget about $65M
  - About 100 awards per FY
  - Individual awards more than $50K, less than $2M

Key S10 Program Elements

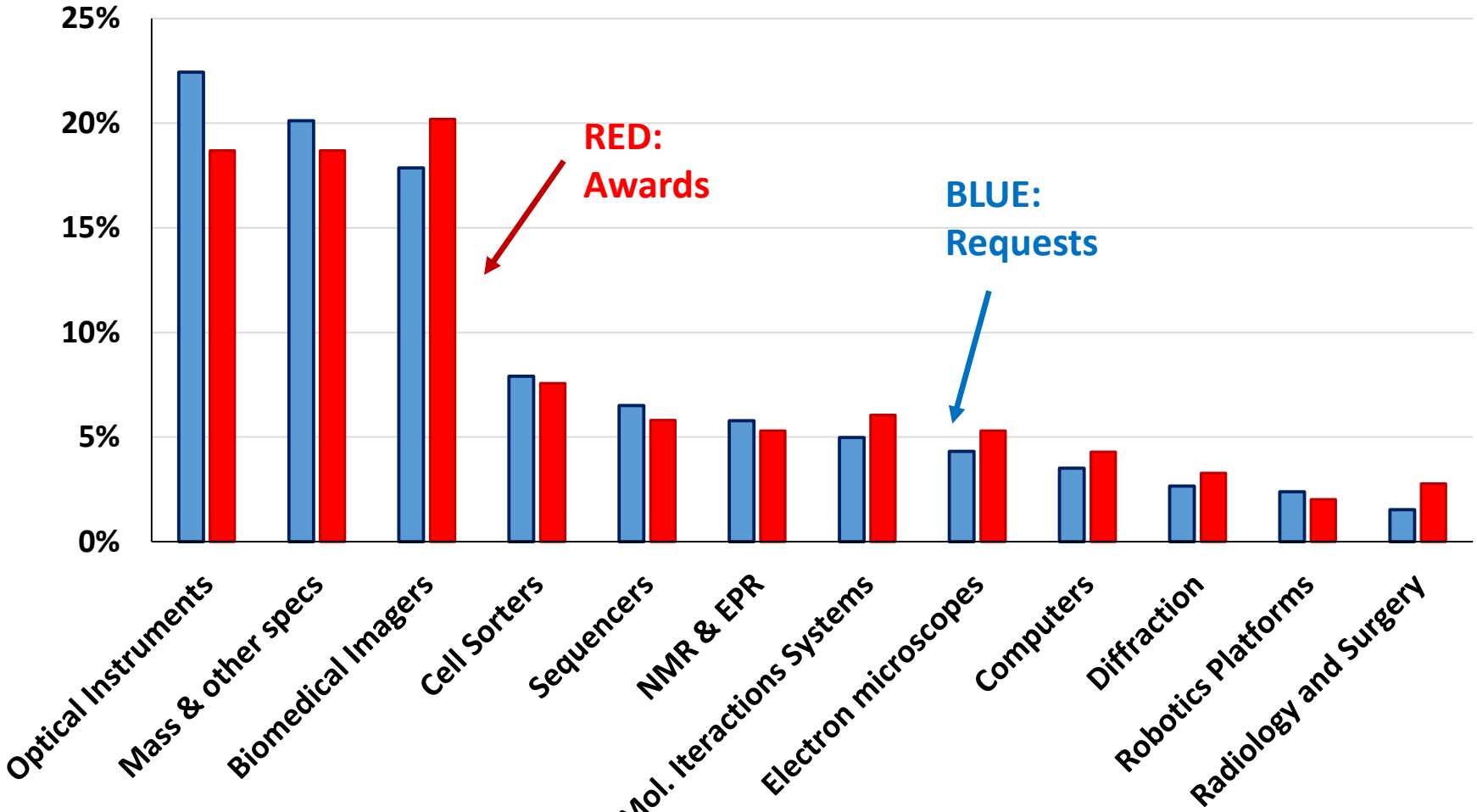
- Program funds Instruments only
  - No maintenance agreements
  - No technical support
- Plan to administer the grant/instrument and assure equitable use on the shared basis
  - Encouraged to house instruments in a core facility
  - Cost-effectiveness of the Program
- Major User group of 3 or more NIH-supported grantees
  - 10-15 NIH-funded users on average
    Target of ~80% usable capacity
- Justification of the need of the Instrument by Research Projects

S10s Benefits NIH Research



Data: FY 2015
Active NIH-funded research grants listed in S10 awarded applications – percentages by IC

Supported Instruments/Funding Decisions



Data: SIG FY2012-2015:

1506 appls/requests, 396 awards

FASEB
Federation of American Societies for Experimental Biology

Representing 125,000 Researchers

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April 5, 2016

Ensuring Proper Acknowledgement of Shared Resource Facilities and Instrumentation: Position Statement of the Federation of American Societies for Experimental Biology

Shared resource facilities and instrumentation broaden access to cutting-edge technology, create new opportunities for interdisciplinary research, and extend the value of research funding. The Federation of American Societies for Experimental Biology (FASEB) recognizes the unique contributions of these facilities to life science research and the need for their continued support. By acknowledging shared resource facilities and instrumentation in publications, presentations, and other research communications, investigators play a critical role in ensuring their continued availability and future development. While such recognition is often a condition of grants that support facilities and defray user costs, acknowledgement is important regardless of grant requirements, as it contributes to assessment of facility productivity. Low acknowledgement rates diminish the ability to secure future support for an individual facility from external sponsors and the home institution. Acknowledgement also serves as an important source of professional recognition for facility directors and staff members who provide critical support and technical expertise for individual research projects. Reporting of facility and instrumentation also contributes to rigorous and transparent reporting of research results.

Ensuring Proper Acknowledgement of Shared Resource Facilities and Instrumentation:

Suggested strategies and best practices

— Facilities —

- Ensure that acknowledgement information (official core name, relevant grant numbers, etc.) is highly visible and easy to locate. Potential places to display it include:
  - Facility website
  - Data/results reports
  - Bills, invoices, and usage summaries
  - Signage in the facility
  - Adhesive labels that can be placed in laboratory notebooks
  - Staff email signatures
  - Thank you messages to users
  - ABRF's Core MarketPlace
- Provide standard language that investigators can insert into a manuscript. For example:
  - *[Technique/technology]* was performed by the *[facility name]* at *[institution name]*, which receives financial support from *[sponsor name (grant number)]*.
  - We thank the *[institution name] [facility name]*, especially *[staff name]*, for their assistance with *[technique/technology]*.
- Remind investigators to acknowledge the facility when providing them with methodology, materials, and analysis information for a manuscript
- Verify that training sessions and materials describe when and how to acknowledge the facility and why this practice is important
- Track new publications by facility users (i.e., with specialized software, PubMed search alerts, etc.)
  - Thank research teams that acknowledge use
  - Remind those that failed to do so that this information should be included in the future

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Ensuring Proper Acknowledgement of Shared Resource Facilities and Instrumentation:

Suggested Strategies and Best Practices

— Researchers —

- Record key information about the facility, instrument, and any corresponding grant numbers in laboratory notebooks
- Check with all co-authors to determine if any facilities or shared use instruments should be acknowledged before submitting a manuscript, grant application, or any other type of publication
- Share draft manuscripts with the facility director or staff to ensure accurate reporting of methodologies, materials, and analyses
- Consider whether co-authorship is appropriate in addition to acknowledgement. The Association of Biomolecular Resource Facilities (ABRF) Authorship Guidelines provides a helpful decision framework

Ensuring Proper Acknowledgement of Shared Resource Facilities and Instrumentation:

Suggested strategies and best practices

— Journals —

- Include a specific prompt for authors to provide information on facility usage. This could be incorporated into the:
  - Instructions to authors
  - Disclosure of author contributions
  - Final acceptance process
- Exclude the acknowledgement section from any word count limits

— Institutions —

- Assist shared resource facilities in tracking new publications by users. This information can help identify instances where acknowledgement was overlooked, providing a more complete measurement of facility impact and personnel contributions

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Whether to Mass Spectrometer?

Only thing certain is there will be new ones and they will be more expensive.

- New mass specs cycle in every 4-6 years with ~10% - 15% increase in cost.
- Service contracts aligned with initial instrument cost; not service required.
- Instrument development is currently only marginally driven by science. More so by technology.
- In general, the instruments are more “user friendly” to operate; not to service.
- Novel, hybrid mass specs are gaining ground (Cytofs etc.).

The Future for Cores:

More of the same but with greater regulation, compliance and professionalism required

- Performance standards (scientific, managerial, business) will increase for cores.
- Some cores may be embedded within scientific teams (aka Team Science).
- Integration of cores for seamless access and scientific production.
- Regional sharing of resources to minimize redundancy; problematic.

Thank You

ABRF 2017 Annual Meeting
March 25-28, 2017
San Diego, CA

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