

# Curriculum for Guidance in Managing Academic Biomedical Core Facilities

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# Curriculum for Guidance in Managing Academic Biomedical Core Facilities

## Curriculum

- Session recordings
- Slides

Available at: [xleratornetwork.com](http://xleratornetwork.com)

## Direct Communications

- [alan.daugherty@uky.edu](mailto:alan.daugherty@uky.edu)
- Zoom

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### SESSION 1:

GUIDANCE IN MANAGING BIOMEDICAL CORE FACILITIES SUPPORTED BY NIH FUNDING

DATE: Monday, February 27, 2023

TIME: 2:00 pm - 3:30 pm Eastern Time

#### Summary

Many Principal Investigators have either no or minimal experience or training in managing core facilities, and this shortcoming is compounded by appointing Core Directors based on their scientific/technical expertise without an appreciation for the spectrum of characteristics that are needed to operate and sustain successful core facilities which must adhere to Federal cost principles. This session is the first in the series to provide a road map for attaining the self-sustainability expected by the Funder.

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### SESSION 2:

GUIDANCE IN MANAGING BIOMEDICAL CORE FACILITIES: OPERATIONS

DATE: Monday, March 13, 2023

TIME: 2:00 pm - 3:30 pm Eastern Time

#### Summary

Many operational aspects of service cores need to be considered for developing effective facilities. This includes staffing appropriately qualified people with a customer service mentality. Also, the equipment in the core needs to be matched to the users' needs and maintained in a highly functional state. The efficiency of the staff and equipment also needs to be optimized to facilitate access that can be managed by several software options. This session will discuss these aspects of core operations.

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### SESSION 3:

GUIDANCE IN MANAGING BIOMEDICAL CORE FACILITIES: ENHANCE DATA MANAGEMENT AND SERVICE CORE USE

DATE: Monday, April 10, 2023

TIME: 2:00 pm - 3:30 pm Eastern Time

#### Summary

Institutional service cores should be managed in a mode that provides data that will be highly regarded with respect to rigor and reproducibility. This includes the management of information, data quality, and availability. To sustain service cores, they must maintain and enhance their user base. This session will explore strategies for both of these elements.

# Curriculum for Guidance in Managing Academic Biomedical Core Facilities

**Presentation is designed to promote discussion on the  
diverse topics of managing cores**

**Please ask questions at the end of each topic!**

- Raise hand icon (preferred)
- Chat function

Discussion moderated by Dr. Chris Richards  
Director, Light Microscopy Core, University of Kentucky

# Curriculum for Guidance in Managing Academic Biomedical Core Facilities - Overview

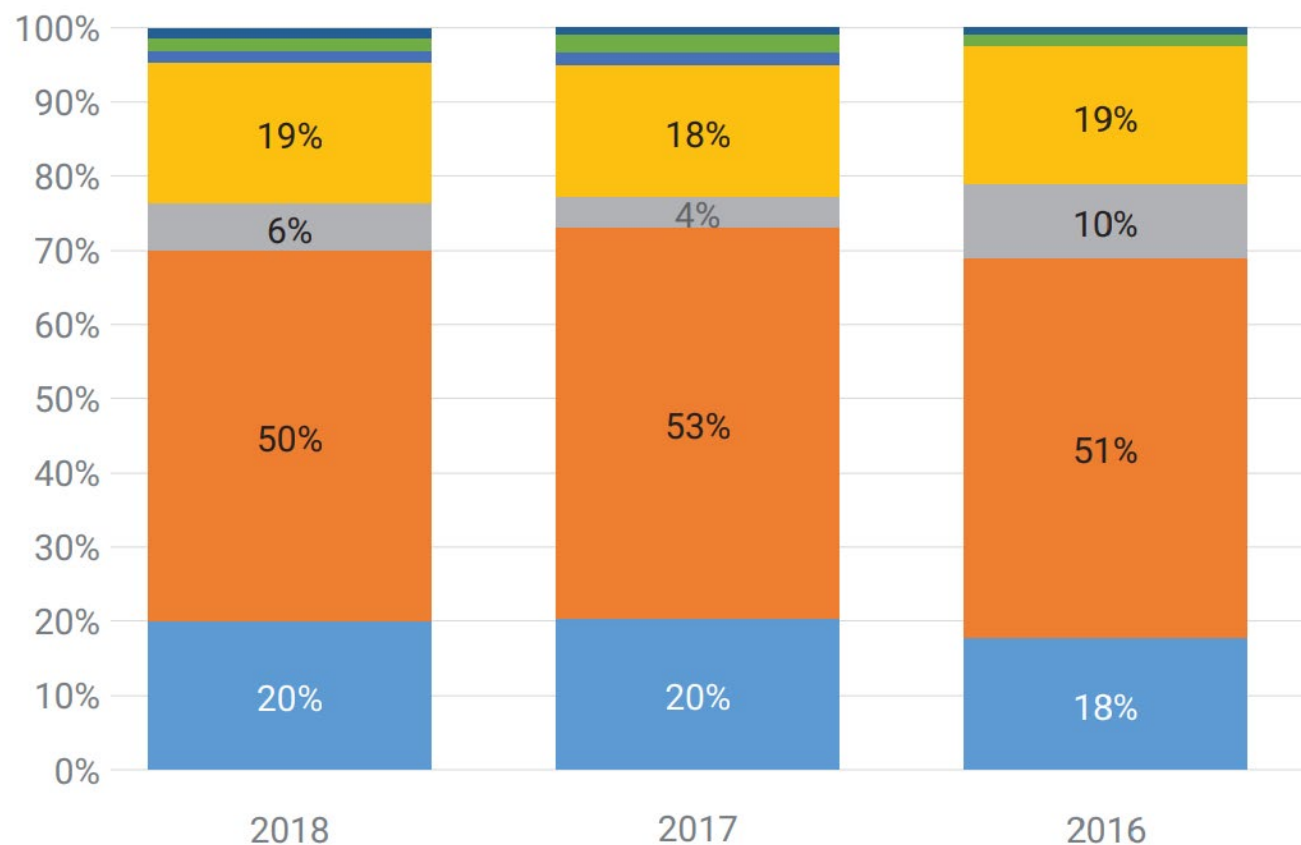
Session	Element #	Topic
Operations	1	Plan for staffing and equipment
	2	Optimize staff and equipment usage and availability
Enhance data management and service core use	3	Manage information, data quality, and availability
	4	Enhance the user base
Financial management	5	Develop rate structures
	6	Fiscal management
Value assessment and contributions to the academic mission	7	Determine the value of service cores to the academic mission of the institute
	8	Institutional oversight

# Session 2 - Operations

Session	Element #	Topic
Operations	1	Plan for staffing and equipment
	2	Optimize staff and equipment usage and availability

# Academic Service Cores

## Expenses Across >100 Institutes



Percentage of Expense by Type



**~ 70-80% of costs**

# **Element 1**

## **Plan for Staffing and Equipment**

# 1. Plan for Staffing and Equipment

## Staffing

### Opinions on Managing Contemporary Core Facilities

The people tasked with running these facilities have a rare collection of skills:

- In-depth knowledge of the hardware they oversee
- Managerial and financial acumen to run what is effectively a business
- Scientific know-how to guide researchers through a range of experimental systems and designs



# 1. Plan for Staffing and Equipment

## Staffing

### Opinions on Managing Contemporary Core Facilities

In a modern core facility technical experts often provide:

- Essential education on how to design an interpretable experiment
- How to validate key methods
- What controls to perform
- Relevant statistical approaches required for data interpretation

Waters JC. A novel paradigm for expert core facility staff training. *Trends Cell Biol.* 2020;**30**:669

# 1. Plan for Staffing and Equipment

## Staffing

Service Cores are usually stand-alone units that need to have appropriate leadership and staffing to maximize use of high technology equipment

- Choose appropriate leaders and staff
- Emphasize the need for “customer service”
- Enhance multiple skills: technical, business, management
- Recognition of contributions to research
- Establishment of job security and advancement options

# 1. Plan for Staffing and Equipment

## Choose appropriate leaders and staff

At all levels, core facility positions involve a love of technology, working with people, working on many diverse scientific questions, and days full of multitasking

# 1. Plan for Staffing and Equipment

## Emphasize the need for “customer service” and skill

- Interpersonal skills of Director and staff are a driving force of the perception of the Core
- Core personnel need to engender the confidence of users regarding their skill and knowledge

# 1. Plan for Staffing and Equipment

## Enhance multiple skills: technical, business, management

### Conferences

- Regional
- National



<https://seasr.abrf.org/>

### Association of Biomolecular Resource Facilities



Boston, MA - May 7-10, 2023

<https://web.cvent.com/event/c098c911-6b50-4c56-9422-11cbf32a088a/summary>

# 1. Plan for Staffing and Equipment

## Enhance multiple skills: technical, business, management

### Conferences

- Instrument specific

### Selected examples

- Instrument manufacturers
- Cold Spring Harbor Laboratory
  - Quantitative Imaging: From Acquisition to Analysis
    - Waters JC. A novel paradigm for expert core facility staff training. *Trends Cell Biol.* 2020;**30**:669
- Vanderbilt
  - Advanced Imaging Mass Spectrometry
    - <https://medschool.vanderbilt.edu/aims/aims.2023/>

# 1. Plan for Staffing and Equipment

## Enhance multiple skills: technical, business, management

To permit training and conference attendance requires institutional commitment of:

- Time
- Money
- Coverage during absence

# 1. Plan for Staffing and Equipment

## Recognition of contributions to research

- Recognition of Core Director in publications
  - Authorship
  - Acknowledgment
- Recognition of Core Staff in publications
  - Authorship
  - Acknowledgment

Association of Biomolecular Resource Facilities guidelines

[https://www.abrf.org/index.php?option=com\\_content&view=article&id=143:authorship-guidelines&catid=20:site-content](https://www.abrf.org/index.php?option=com_content&view=article&id=143:authorship-guidelines&catid=20:site-content)



# 1. Plan for Staffing and Equipment

## Establishment of job security and advancement options

Service Core Facility activities need to provide career options

- Recognition of faculty effort to promotion and tenure decisions (team science)
- Advancement options for core staff

Questions

# 1. Plan for Staffing and Equipment

## Equipment

- Institutional selection process
- Equipment selection within a core
  - Expansion of capacity
  - Enhanced capability
- Focusing equipment purchase on service cores
- Several Federal agencies have grants for acquiring equipment
- Institutional priorities on core equipment

# Service Cores Can Prioritize Equipment Acquisition Decisions

## Institutional selection process

- Core are well placed to drive an institutional selection process



# 1. Plan for Staffing and Equipment

## Equipment selection process

How to gauge potential users:

- Surveys
- On site demonstrations
- Price tolerance (how to estimate user fees)
- Instrument-based seminars

Our experience – very poor predictors of demand once installed

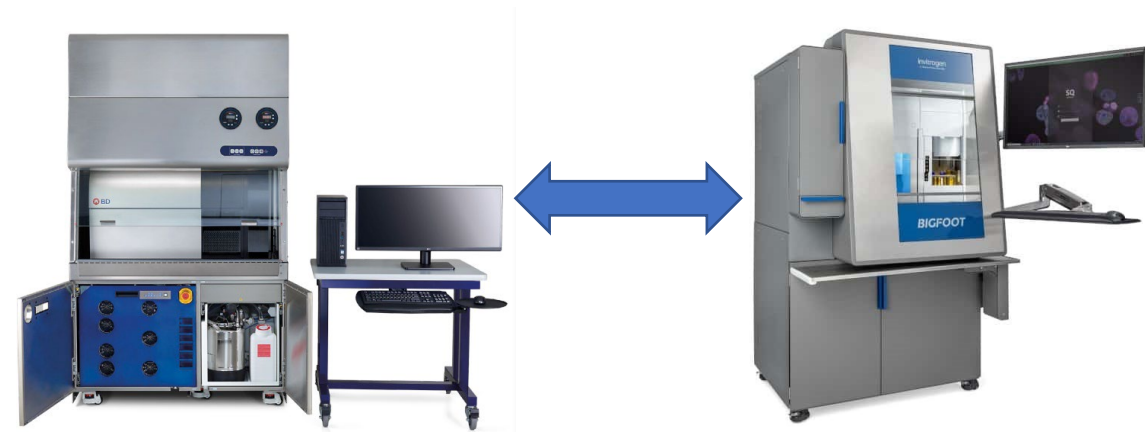
# 1. Plan for Staffing and Equipment

## Selection of Equipment Purchases

### Influences on choice

- Funding
- Cost of equipment
- User preferences – frequently not uniform
- Familiarity of users with manufacturer
- Cutting edge versus work horse
- Volume of work
- Standard platform
- Quality of service

### Competition for Different Instruments of Similar Capability



# 1. Plan for Staffing and Equipment

## NIH Grant Mechanisms for Equipment Acquisition for Cores ORIP – Office of Research Infrastructure Programs

### R24 Equipment Program

- ORIP introduced the R24 Equipment Program to support the acquisition and installation of modern research-supporting equipment to enhance the operations and protocols in biomedical research facilities. Core facilities, animal research facilities, and other similar shared-use facilities are spaces targeted by this program. \$50K to \$250K in direct costs.

### S10 Instrumentation Programs

- Basic Instrumentation Grant Program (BIG) – BIG Program funds grant awards in the \$25K to \$250K
- Shared Instrumentation Grant Program (SIG) – SIG Program funds grant awards in the \$50K to \$600K
- High-End Instrumentation Grant Program (HEI) – HEI Program funds grant awards in the \$600K to \$2,000K

# 1. Plan for Staffing and Equipment

## NIH Grant Mechanisms for Equipment Acquisition for Cores ORIP – Office of Research Infrastructure Programs

- Whenever practical, the S10 funded instrument should be integrated in a centralized core facility, to encourage optimal sharing among individual investigators, research groups, and departments, and to foster a collaborative multidisciplinary environment
- No matching funds, but expectation of support such as the space to house the instrument, technical personnel, and post-award service contracts for instrument maintenance and operation



# 1. Plan for Staffing and Equipment

## NIH Grant Mechanism for Equipment Acquisition for Cores ORIP – Office of Research Infrastructure Programs

### Issues

- Require the coordinated effort and responses of multiple faculty
- Helpful to enlist the assistance of a Proposal Development Office (if available)
- Difficult to acquire “work horse” instruments that provide additional capacity
- Depreciation can not be included in rate structure calculation

# 1. Plan for Staffing and Equipment

## Other Federal Programs

### NSF

- Major Research Instrumentation Program
  - <https://beta.nsf.gov/funding/opportunities/major-research-instrumentation-program-mri>

### DOD

- Defense University Research Instrumentation Program (DURIP)
  - <https://www.nre.navy.mil/education-outreach/sponsored-research/university-research-initiatives/durip>

# 1. Plan for Staffing and Equipment

## Institutional priorities on core equipment

- Institutional emphasis on focusing resources on purchasing equipment in core labs rather than replicating equipment in Departments or individual labs
- Process for auditing all equipment purchases using institutional funds to determine whether it would be more appropriate for a service core.

Questions

## **Element 2**

**Optimize Staff and Equipment Usage and Availability**

## 2. Optimize Staff and Equipment Usage and Availability

Service Cores need to be organized to accommodate multiple users in a mode that optimizes the staff and equipment time

- Implement a web-based facilities management system
- Time management of equipment and personnel

## 2. Optimize Staff and Equipment Usage and Availability

### Implement a web-based facility management software

The basics

- Web-based instrument/service booking system
- Intuitive interface
- Facilitate optimal use of equipment and personnel
- Restrict access until completion of training
- Monitor use of equipment
- Automated billing procedures – integration into institutional financial system

## 2. Optimize Staff and Equipment Usage and Availability

### Implement a web-based facility management software

Some section criteria

- Cost
- Transfer of data from previous system
- Ability to use institutional login
- Ease of setup for monitoring equipment use



## 2. Optimize Staff and Equipment Usage and Availability

### Implementation of Facility Software Management

- Agilent CrossLab iLab
- Stratocore PPMS
- Idea Elan Infinity
- QReserve
- Facilitates Online Manager (FOM)

<https://www.agilent.com/en/service/laboratory-services/lab-operations-management/core-facilities-management>

<https://www.stratocore.com/>

<https://www.ideaelan.com/>

<https://get.qreserve.com/>

<https://www.fomnetworks.com/>

Questions

## 2. Optimize Staff and Equipment Usage and Availability

### Time Management

- Charging for use versus booked
  - Making a prospective choice for billing
- Ensure equitable access to instruments
  - Restrictions of time frame of booking (for example, booking that are mid-morning to mid afternoon can impact the entire day)
  - Placing restrictions so that one user/lab does not monopolize the instrument(s)

## 2. Optimize Staff and Equipment Usage and Availability

### Charge structure for instrument training

Many cores operate in a hybrid mode that requires users to be trained for appropriate use of specific instruments and authentic acquisition of data

#### Detriments of charging

- Decrease use of facility (maybe)
- Increased training for specific instruments

#### Benefits of charging

- Increase likelihood of training for using an instrument in the core
- Lessens the time diverted to unnecessary training for the core personnel
- Variability in acquiring competence between individuals renders difficulties in providing uniform training time for a specific instrument

## 2. Optimize Staff and Equipment Usage and Availability

### Charge structure for consultation

In addition to time using technical skills and instruments, many core facility personnel expend time for associated tasks such as discussion of experimental design and analysis and interpretation of data

- Benefits of consultation
  - Optimize experiment
  - Enhanced confidence in data interpretation

#### Detriments of consultation

- Without a rate structure, there is a financial burden to cover costs for uncompensated services
- Labs will consider it to be a cost burden

Questions

# Curriculum for Guidance in Managing Academic Biomedical Core Facilities – Schedule for 2023

Session	Date	Time (EST)
Operations	March 13	2-3:30 pm
Data management and enhancing service core use	April 10	2-3:30 pm
Financial management	May 15	2-3:30 pm
Value assessment and contributions to the academic mission	June 12	2-3:30 pm

# Feedback

**Alan Daugherty**  
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**Session recording and slides will be available at:**  
**[xleratornetwork.com](http://xleratornetwork.com)**



