Resource sharing in biomedical research – advancing the institutional research mission through the Cores

NIH-ABRF Workshop
Enhancing Efficiency of Research Core Facilities
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Resource sharing grew out of need for access to technology & expertise. Consolidating and centralizing mandate from NCRR to drive efficiencies for collaboration to tackle big problems.

Biggest challenge remains - $ for shared instrumentation, not salaries for expertise. Evolution towards translational research (preclinical, clinical, outcomes etc.) requires core resources, cross-disciplinary approaches and team science.
## History of Shared Resource Consolidation at NYULMC

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
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<tbody>
<tr>
<td>Jul 2007</td>
<td>Robert Grossman appointed Dean</td>
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<td>Vivian Lee appointed Vice Dean for Science</td>
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<td>Sep 2007</td>
<td>Science Leadership Commission investigates faculty research needs</td>
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<td>David Levy &amp; Bill Carroll, Co-Chairs</td>
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<td>Sep 2008</td>
<td>Science Leadership Commission reports on needs for investment in research infrastructure</td>
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<td>Sep 2009</td>
<td>Office of Collaborative Science formed to coordinate research infrastructure</td>
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<td>David Levy appointed Assoc. Dean</td>
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<td>Oct 2009</td>
<td>Recruitment S. Mische</td>
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<td>Sep 2010</td>
<td>Hired OCS business manager, coordinator, LIMS</td>
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<td>Consolidation of 10 cores under OCS</td>
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<td>ARRA grant</td>
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The Office of Collaborative Science (OCS)

- Collaborative model of interdisciplinary science and administration aligned with institutional mission to enhance collaboration, strategic planning and investment
- Circumvent obstacles and delays in obtaining access to technologies needed for funded research projects

Mission statement: catalyze transformative changes in translational research through collaborative science, state of the art infrastructure, and cutting-edge education
<table>
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<tr>
<th>Core Directors</th>
<th>Cores and Shared Resources</th>
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<tr>
<td>Histopathology Core</td>
<td>Anti-Infectives Screening Core</td>
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<tr>
<td>RNAI Core</td>
<td>Bioinformatics Core</td>
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<tr>
<td>Analytical Chemistry Core</td>
<td>Biostatistics Shared Resource (BSR)</td>
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<td>Rodent Be</td>
<td>Cytometry and Cell Sorting</td>
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<td>Experimental Animal &amp; Exposure Core</td>
<td>Experimental Pathology Shared Resource</td>
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<tr>
<td>Insectary Core</td>
<td>Genome Technology Center (GTC)</td>
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<tr>
<td>Mouse Genotyping Core (MGC)</td>
<td>Glass Wash Team</td>
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<tr>
<td>Small Ani</td>
<td>Proteomics Resource</td>
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<tr>
<td>Small Instr</td>
<td>Reagent Preparation</td>
</tr>
<tr>
<td>Stem Cell Core (SCC)</td>
<td>Translational Research Core</td>
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[http://ocs.med.nyu.edu/cores-and-shared-resources](http://ocs.med.nyu.edu/cores-and-shared-resources)
CHALLENGES to consolidation at NYULM

- Navigating a large, highly decentralized institution
  - contrasting departmental cultures
  - ownership
  - inconsistent historical data
  - evolving organizational structure
  - trust
- Academic vs. Corporate leadership
  - lack of shared vision, goals
    promotes independence & ownership
  - no incentive for teamwork & collaboration
  - overlapping/competing priorities
Start with the definition of Core

- Centralized resource for expertise and technology
- Provide expertise / services not available commercially or prohibitively expensive
- Facilitation of collaboration between researchers
- Institution-wide availability
- Reduction of duplication in instrumentation and expertise
- Reduction of overall institutional costs

Balance the potential benefits against the funds & space available
Requirements for Shared Resource Cores

• Identification of need
  – Technologies
  – Potential users
  – Projected volume of use

• Alternatives?
  – Other institutional resource centers
  – Commercial sources
  – Provision by existing center

• Identification of funding
  – Institutional funds
  – Granting opportunities
  – Gifting opportunities

• Identification of expertise
  – In house, recruitment

• Business plan
  – Start up costs (including renovation, staff, instrumentation, maintenance, supplies)
  – Operation costs (3 years)
  – Expected cost recovery
  – Benchmarking

• Space identification for resource

• Identification of members for Scientific Advisory Board
7 CRITICAL COMPONENTS TO CREATE A COLLABORATIVE RESEARCH ENVIRONMENT

1. STRONG AND CONSISTENT INSTITUTIONAL SUPPORT – Leverage institutional support to invest in access to expertise, establish institutional knowledge management

2. BUILD A STRONG OVERSIGHT COMMITTEE — Ensure the alignment, productivity, and financial solvency of cores by forming a committee to oversee the activities and performance of all shared resources.

3. CREATE ACTIVE FACULTY ADVISORY COMMITTEES — Leverage teams of influential investigators to support individual cores, evaluate instrumentation and staffing needs and assist with extramural grant funding activities.

4. MAKE DATA-DRIVEN DECISIONS — Use data and analytics to understand core users, track grants, and evaluate the performance for each core.

5. IMPLEMENT A CENTRAL BILLING SYSTEM — Create a single administrative group to handle billing and financial reporting for each core.

6. HIRE EXPERTISE — Hire scientists who are educators and innovators, to advance research and connect the scientific community in new ways.

7. FOSTER TEAMWORK & COLLABORATION — Not just within the core, but among all of the cores, by bringing together core directors and scientists throughout the institution.
Build a partnership of resource sharing and INVESTMENT to benefit the ENTIRE community

- Partnering to identify opportunities and provide financial support
- Committed institution and policies to enable resource sharing
- Driving the conversation
- Democratize science
Office of Collaborative Science Core Structure

OCS Advisory Board

Core Director
- Associate Director
- Assistant Director
- Core Manager
- Sr. Research Scientist
- Research Scientist
- Associate Research Scientist
- Assistant Research Scientist
- Program Coordinator
- Sr. Research Technician
- Research Technician
- Research Associate

Scientific oversight, goal review, strategic planning

User Group
- Sounding board for Core, SAB for user needs
Create opportunities for education, exchange, “what if…”

The Office of Collaborative Science (OCS) is launching an ongoing seminar series called “Lunch and Learn,” where on the last Tuesday of each month from 1:00 p.m. to 2:00 p.m., a core director will present. Researchers, postdocs, and graduate students are encouraged to bring their lunch and learn about the cores’ current and future services. Beverages and light snacks will be served to enjoy with your “brown bag” lunch.

Mark your calendar, and come to Skirball 5 CR with your lunch:

Feb. 24: Chi Yun, PhD, Director, RNAi Core
Mar. 31: Alice Liang, PhD, Director, Microscopy Core
Apr. 28: Cindy Loomis, PhD, Director, Experimental Pathology Core
May 26: Chris Hansis, PhD, Director, Stem Cell Core
Jun. 30: Youssef Zaim Wadghiri, Director, Small Animal Imaging
Jul. 28: Peter Lopez, Director, Flow Cytometry Core
Aug. 25: Trixi Uebberheide, PhD, Director, Proteomics Resource Ctr.
Sep. 29: Adriana Heguy, PhD, Director, Genome Technology
Oct. 27: Debra Morrison, PhD, Immune Monitoring Core
Nov. 24: Sang Yong Kim, PhD, Rodent Genetic Engineering
Dec. 29: Steven Shen, PhD, Bioinformatics Core

(Speakers and topics subject to change. Dates confirmed.)
Core consolidation provides an institutional platform for extramural partners
…and critical to NYULMC post Sandy recovery
SILVER LINING Nucleation event for culture change

...Impact of Sandy on perceptions of shared resources, shared vision

- Infrastructure collapse strengthened community, collaboration, teamwork
- Cores lead by example and were nucleation site
- Created a distributed model of cores to meet demands of relocated researchers
- Streamlined partnering with external academic and industry partners
Hire expertise, educators, innovators

- Core Directors are fulltime, non-tenured faculty
- Offer comprehensive services from experimental design to data interpretation
- Develop integrated project-centric, cross-disciplinary teams
- Must be not only a creative scientist but demonstrate competencies:
  - Collaborative
  - Business (and financial) acumen
  - Good communicator
  - Approachability
  - Managing Vision and Purpose
  - Entrepreneur
Foster Teamwork and Collaboration

Leadership Development Program

- Lominger competencies for Core Directors (4 half day sessions)
  - Customer Focus
  - Developing Direct Reports and Others
  - Teamwork and Collaboration
  - Managing vision and purpose

- OCS Team development
  - MBTI assessment
  - Conflict resolution styles
  - Receiving feedback from others
  - Establishing Roles & Responsibilities
  - Establishing Goals, Expectations

- Individual Core Director Leadership development
  - 360 Multi-Rater Feedback
  - 1:1 coaching
  - On-line HBS courses
Retain talent

Revised Faculty Titles at NYU School of Medicine

- Instructor
- Assistant Professor (Research)
- Associate Professor (Research)
- Professor (Research)
- Assistant Professor (Clinical)
- Professor (Clinical)
- Professor

Part Time
- Research Track
- Research Assistant Professor
- Associate Professor (Research)
- Professor (Research)

Full Time
- Tenure Track
- Investigator / Educator Track
- Investigator / Clinician / Educator Track
- Clinician Investigator / Educator Track

Clinical Track
- Clinical Assistant Professor
- Clinical Professor

A full-time non-tenure track for those faculty members in any department whose primary career is in research, but who devote a portion of their efforts to education and service.
OCS Core Director faculty promotion criteria

• **Epitomize a Culture of Excellence:** *catalyze transformative changes in translational research through collaborative science, state of the art infrastructure, and cutting-edge education.*

• **Exhibit a strong collaborative nature**
  – The merit criteria for the OCS core faculty must be aligned with the institutional strategy and mission for the NYULMC’s vision of highly collaborative, interdisciplinary, team-based, complex science. Therefore, **not only individual achievements, but also collaborative, interdisciplinary and translational collaborative achievements must be the basis for success of OCS Core**

• **Contributions to academic mission**
  – **Directing a Core Resource Laboratory**
  – Serving as collaborating investigator that aids in obtaining or renewing grant funding for the institution
  – Selection as grants reviewer at national or regional level
  – Selection as editorial board member in peer reviewed journal
  – Selection as a consultant to externally funded, not-for-profit organization

• **Publications / acknowledgements** in a variety of fields across scientific, biomedical, and technology journals.

• **Funding** for technology and expertise based cores is **limited** compared to other biomedical fields; may be primarily obtained via collaborative grants.
evolving cores model: epicenter for team science

• Drive translational research between the clinical and research sides of NYULMC.
• Develop integrated project-centric, cross-disciplinary teams
• Provide nucleation for collaboration
• Offer comprehensive services from experimental design to data interpretation
...challenges

• Change in culture:
  – Reward teamwork, community behavior
  – Broken model for training PhD scientists – shifting paradigm

• NIH funding – shift from RO1 to multi-investigator grants to drive team science, core integration

• Funding for Cores
  – “non-billable” core activities = institutional investment
    • Experimental design
    • Education and mentoring of next generation
    • Innovation - new methods development and validation
    • Core scientist team science
    • “Big Data” generation, data sharing/integration

• Metrics for ROI: Balance service/scholarship/collaboration by core scientists
  • Contribution to grants submitted, funded, % effort, education, IP
  • Authorship policies