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NORTHWESTERN UNIVERSITY

THE UNIVERSITY OF CHICAGO

UIC UNIVERSITY OF ILLINOIS AT CHICAGO

Core Facility Partnership Feasibility Study

Final Report
March 2010

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Core Facility Partnership Feasibility Study

Report outline

- Executive Summary
- Observations
- Recommendations
- Next Steps
- Appendix

Executive Summary

Project objectives and scope

- The primary focus of our study was on the key issues and obstacles related to possible core research facility partnerships between:
  - Northwestern University (NU)
  - University of Chicago (U of C)
  - University of Illinois at Chicago (UIC)
- Key value proposition of our review:

> Development and discussion of recommendations related to the potential open access to, and formal cooperation among, selected biomedical core research facilities for investigators at NU, U of C, and UIC.

- Despite our focus on biomedical facilities, several of our recommendations are of a nature general enough to be applicable to core facilities in other scientific and engineering disciplines.
- Such partnerships, offering open access and formal cooperation, offer the potential to increase the effectiveness, efficiency, financial performance, accessibility, and adaptability of core facilities at Chicago research institutions – and their contributions to faculty and the research enterprise.

Executive Summary

Project approach

- Activities undertaken as part of our study included interviews and selected review of facility data.
- *In-Depth Interviews of Key Stakeholders* – We conducted interviews with over 75 individuals involved in the operations and management of core research facilities at the three institutions, members of central and unit research leadership and administration at the three institutions, and faculty members. (A list of interviewees is provided in the Appendix.)

Our interview observations provided a framework for better understanding faculty members' and administrators' satisfaction levels and needs associated with core facilities at the three institutions, facilities' shared and unique challenges and opportunities, and the current and potential roles and responsibilities that university administrators and leaders have in improving core facility operations, management, and strategy via partnership approaches.

- We integrated our interview observations with our past core research facility experiences – and drew on 'best practices' relevant to the three institutions – to develop recommendations related to core facility partnership feasibility.

Executive Summary

Summary observations

1. Core research facilities are key elements to the research enterprises of NU, U of C, UIC, and many other research universities across the country.
2. Research enterprise growth at NU, U of C, and UIC has been robust over the past several decades, particularly during the last 10 years.
3. Despite diverse institutional histories and academic and research cultures, the three institutions each have large research enterprises with significant medical schools.
4. The core research facility models that have emerged at each institution differ, but there are numerous potential touchpoints for partnership and collaboration, particularly when looking toward future major core research facilities.
5. This said, numerous challenges and obstacles to increased inter-institutional use of core research facilities are present that must be considered.
6. There are limited best practices in this area, although some examples of core facility partnerships between other institutions may offer lessons learned to NU, U of C, and UIC.
7. Federal funding agencies (especially the NIH and NSF) make significant investments in core facilities at research universities (including NU, U of C, and UIC) and are at an early stage of exploring issues related to inter-institutional and even regional core facility collaboration – presenting an opportunity for the three institutions to explore the opportunities and challenges of core facility partnership and become a resource to these agencies.

Executive Summary

Summary recommendations

Our recommendations related to NU, U of C, and UIC core research facility partnership feasibility are organized into four functional areas:

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Executive Summary

Summary recommendations

Overall, the feasibility of core research facility partnerships between the three institutions (NU, U of C, and UIC) is strong.

This said, such partnerships should be based on specific, strategic opportunities and needs and should be supported by increased joint vision and decision-making and enhanced facility operations and management structures.

Summaries of our recommendations:

I. Joint Vision, Decision-Making, and Investment

I-1. Senior leadership from the three institutions should strongly consider establishing a generalized, overarching core facility partnership agreement or Memorandum of Understanding (MOU).

I-2. The three institutions should begin exploring and moving toward limited joint decision-making and investment in large-scale, strategic core research facilities.

I-3. Senior leadership from the three institutions should consider conducting a limited-time trial of charging internal rates to users from the other institutions.

Executive Summary

Summary recommendations

II. Facility Operations and Management Structures

II-1. The three institutions should continue working together to explore the operational and strategic aspects of core facility partnership via an inter-institutional coordination committee.

II-2. The three institutions should establish a broad inter-institutional working group focused on core facility partnership administrative issues.

II-3. Each institution should devote increased attention to more rigorous core facility rate development and related compliances policies and procedures.

III. Detailed Partnership Opportunity Exploration

III-1. The three institutions should continue to encourage joint discussions and explorations about shared access and partnerships related to core facilities that involve research animals.

III-2. The three institutions should undertake more detailed explorations of specific core facility partnerships, opportunities associated with several identified core facilities.

IV. Facility Networking and Training Opportunities

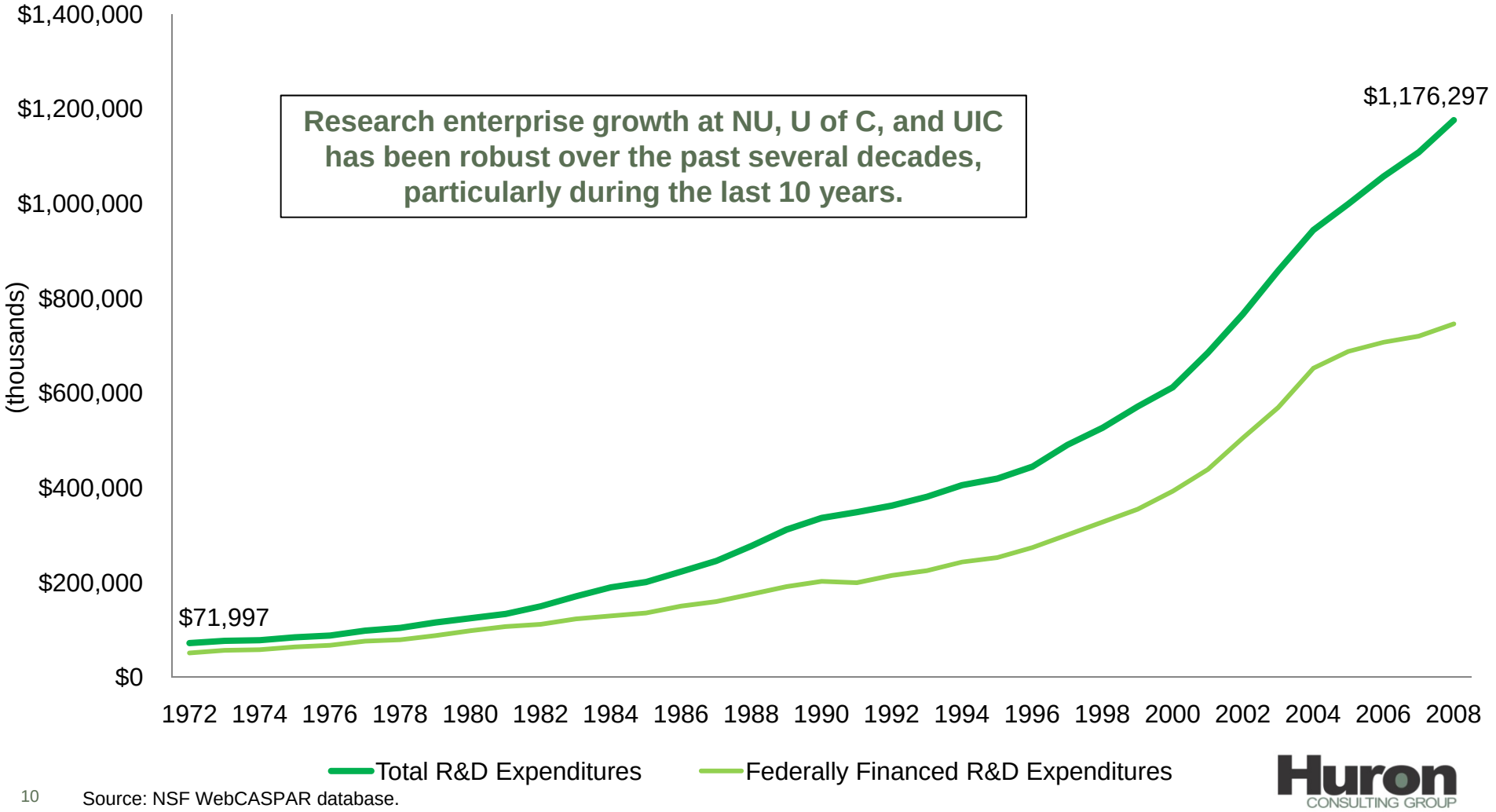
IV-1. The three institutions should explore additional opportunities to facilitate inter-institutional networking between core facility directors and users.

IV-2. The three institutions should continue to explore opportunities to use core facilities to facilitate and enable cross-institutional educational and training opportunities.

Observations

Observations

Research expenditures at NU, U of C, and UIC reached nearly $1.2 billion in FY2008



Source: NSF WebCASPAR database.

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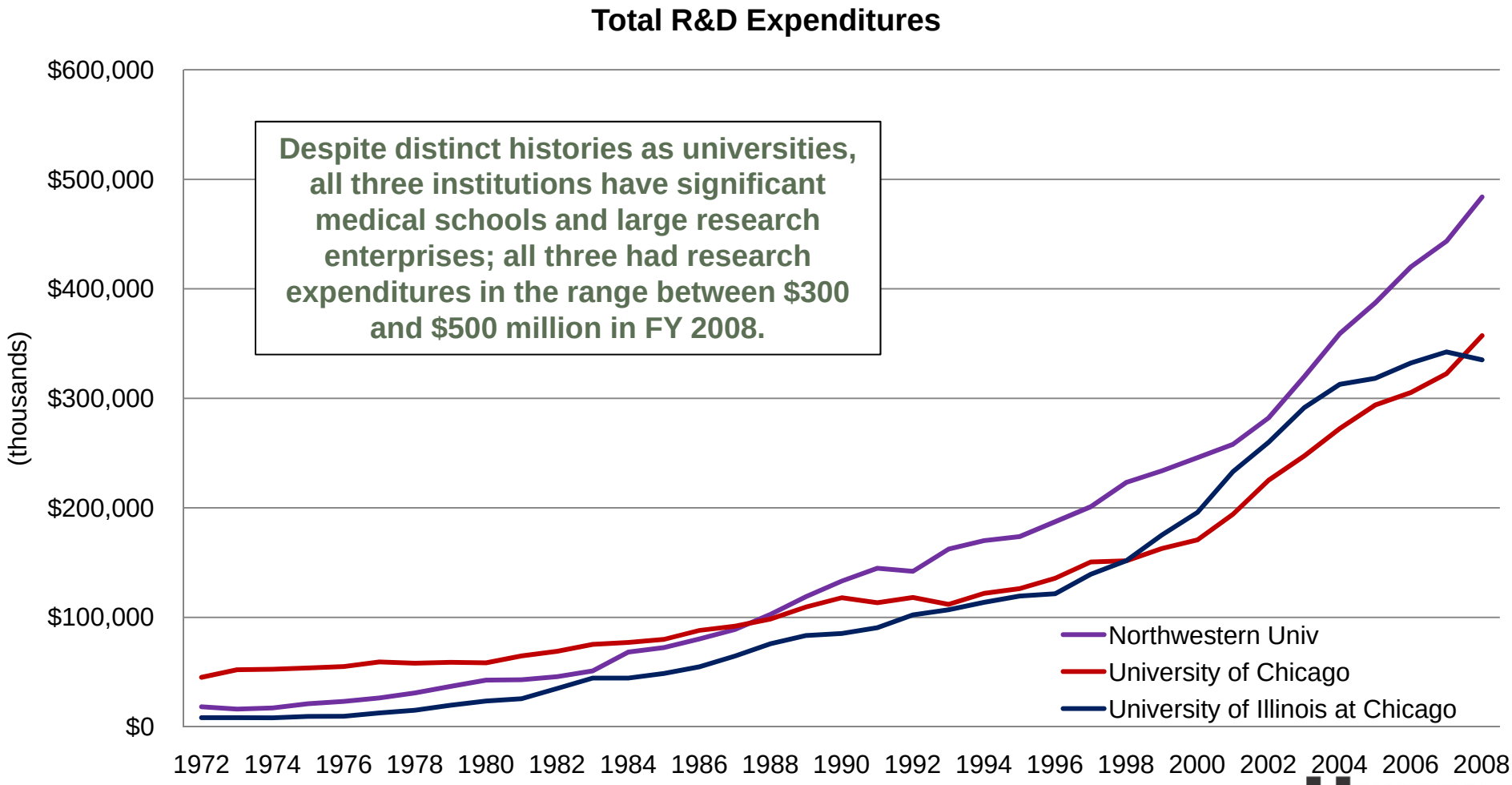
Observations

Institutional growth in total R&D expenditures



Source: NSF WebCASPAR database.

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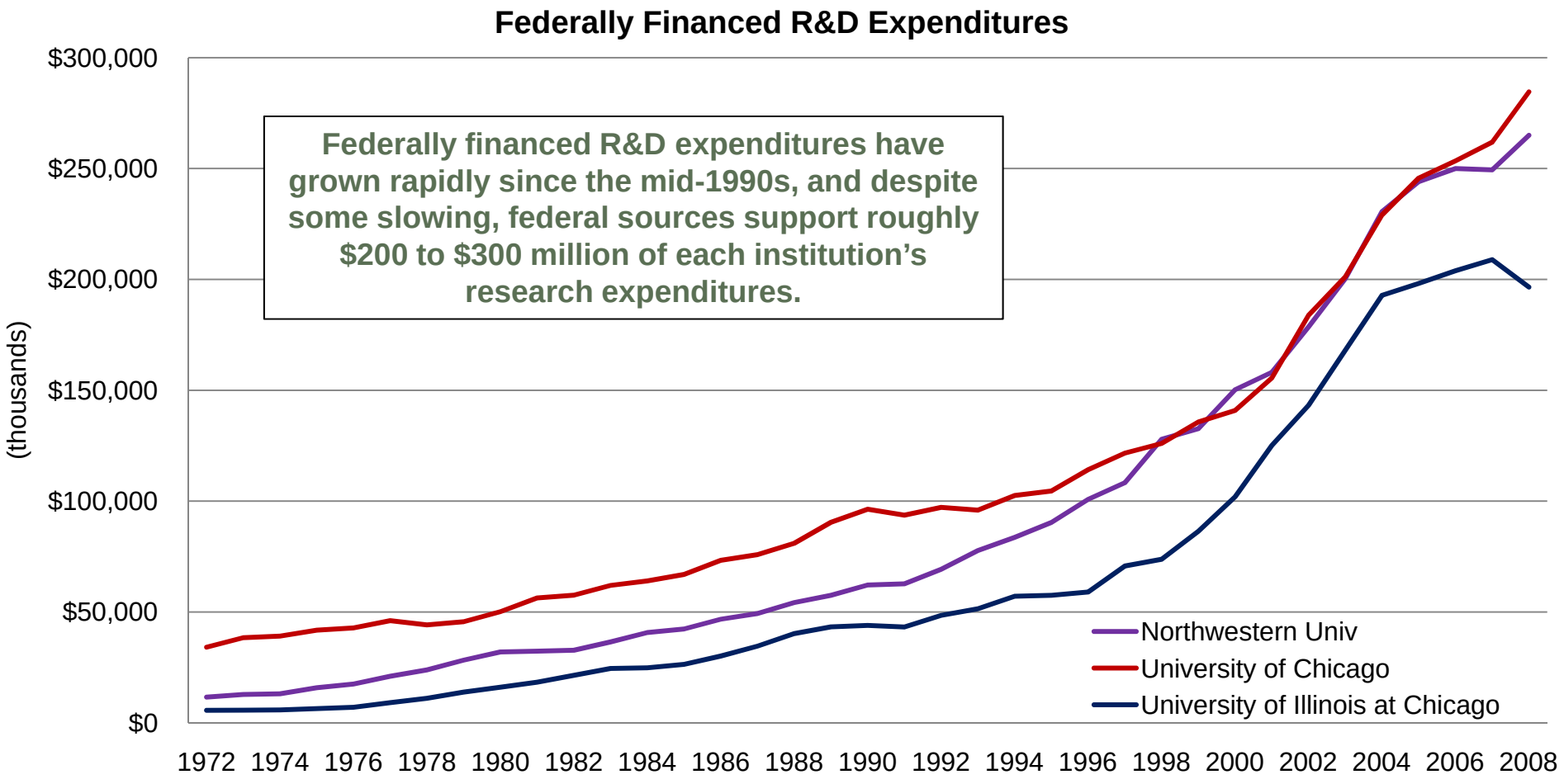
Observations

Institutional growth in federally financed R&D expenditures



Source: NSF WebCASPAR database.

Observations

Core research facility landscape

- Core research facilities (or shared resources, as they are called by NIH's National Cancer Institute) are key elements to the research enterprises of NU, U of C, UIC, and many other research universities across the country.
- The excerpts below provide a situational snapshot of the core research facilities landscape:
  - "Shared Resources provide access to technologies, services, and scientific consultation that enhance scientific interaction and productivity. The support of shared services for an entire center provides stability, reliability, cost-effectiveness, access to specialized technology and methodology, and quality control." [1]
  - "The race is on to develop and effectively use core research facilities to strengthen institutions' research enterprises. Although the impetus to do so varies across disciplines and institutions, it is becoming increasingly clear that the performance of research in many areas within and beyond biomolecular science and engineering (S&E) requires complex, expensive technical equipment that often requires operation by dedicated, skilled scientific personnel.

    "Research institutions—universities, academic medical centers, and independent research institutes—are increasingly realizing the important role that core facilities play in their:
    - Ability to conduct cutting-edge research;
    - Competitiveness for recruiting and retaining strong faculty members; and
    - Competitiveness for external research funding.

    "With this realization comes an understanding that more attention needs to be placed on effective, proactive, and strategic management of these important components of institutions' overall research enterprises." [2]

Sources: [1] The Cancer Centers Branch of the National Cancer Institute, "Policies and Guidelines Relating to the Cancer Center Support Grant." (September 2008); [2] Haley, R. "A Framework for Managing Core Facilities within the Research Enterprise," *Journal of Biomolecular Techniques* 20 (2009).

Observations

Institutional characteristics

- The three institutions have diverse histories, academic and research cultures, and budgets.
- Each operates a large research enterprise with a significant medical school.
  - All three of the institutions have Cancer Centers, and two (NU and U of C) have NCI-designated Cancer Centers, with a combined 28 core facilities significantly supported by NIH.
  - All three of the institutions have Clinical and Translational Science Awards (CTSAs) with significant NIH NCRR support.
  - Two of the institutions (NU and U of C) have NSF-funded Materials Research Science and Engineering Centers (MRSECs) with support for core facilities.
- Furthermore, the core research facility models that have emerged at each institution differ in their degree of central oversight and management, approaches to funding and support core facilities, and other important areas.
- Still, there are many common research areas of strength and pursuit among the three institutions, and thus numerous similar core facilities have emerged at the three institutions.
- These potential touch points represent opportunities for core facility partnership and collaboration.
- In the future, there are likely to be several strategic opportunities for these three institutions to partner on major, cutting-edge core research facilities.
- Addressing the opportunities and challenges associated with such collaborations and partnerships now is likely to lead to short-term as well as long-term opportunities to mutually benefit the institutions' research enterprises.

Observations

Institutional interest in collaboration – Argonne case study

Senior leadership at the three institutions strongly supports research-related collaboration, as referenced recently in a *New York Times* article about Argonne National Laboratory, excerpted below (highlighting added):

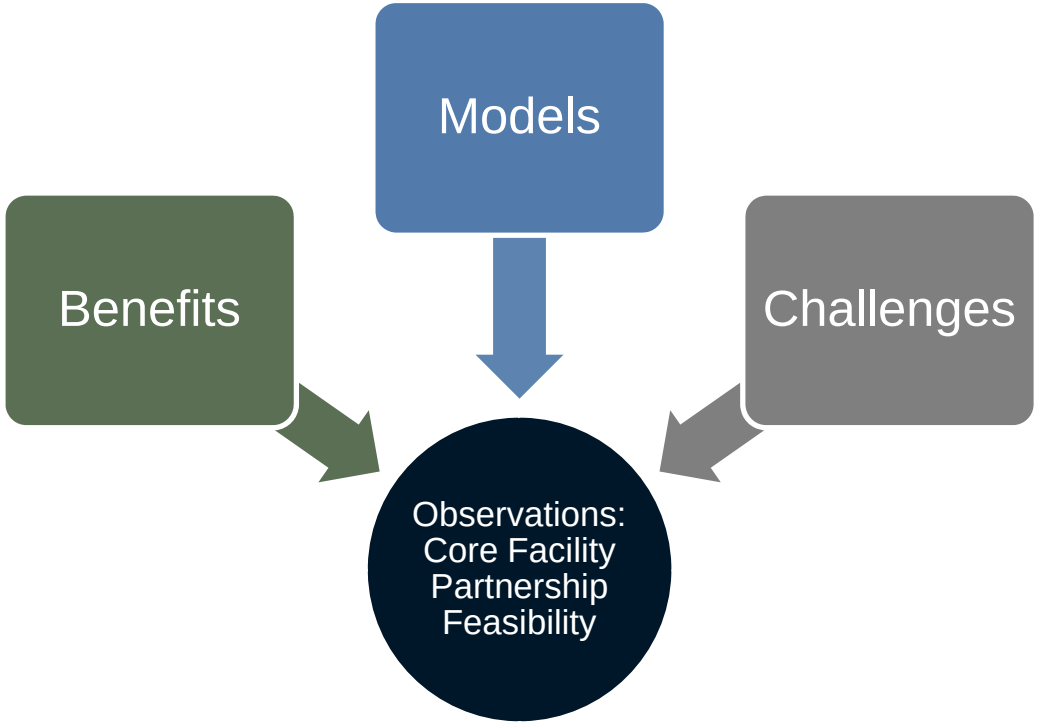
> Over the past three years, the University of Chicago, which had run the laboratory at Argonne for the Energy Department since its inception, invited Northwestern University and the University of Illinois to join in oversight of the laboratory's scientific work. That move has drawn the universities closer not only to Argonne, but also to each other, their leaders said.
>
> In the past year, four federal grants for "energy frontier research centers" were won by Argonne, the University of Illinois, Northwestern and the University of Chicago. By working together, the universities have also won more research grants from the National Institutes of Health and the National Science Foundation.
>
> Winning the energy frontier center grants was a lot easier because of that collaboration, said Donald Levy, vice president for research at the University of Chicago.
>
> "You're not dealing with strangers when opportunities come along," Dr. Levy said.
>
> Northwestern and other universities hope to land another energy research project for Chicago next year. It would be one of the so-called energy research hubs, which are a brainchild of Energy Secretary Steven Chu. He wants to establish laboratories to take large risks when working on energy problems, for potentially big payoffs. Dr. Chu's vision is to create smaller versions of the well-known Bell Laboratories that churned out significant discoveries in past decades.
>
> "It's going to require expertise across a broad range of subfields," said Jay Walsh, vice president for research at Northwestern, "and we have that within these institutions."
>
> Larry H. Danziger, the interim research vice chancellor at the University of Illinois at Chicago, said he and his counterparts spent eight months planning how they could collaborate to win one of three hub awards for the area.
>
> The cooperation, Dr. Danziger said, "is based on Argonne being the glue of our relationship."

Source: Van, J. "At Argonne Lab, a Shift from Radioactivity to Supercomputers," *The New York Times* (31 December 2009).

Observations

Benefits, models, and challenges

The following slides present some of the observed benefits, models, and challenges related to core facility partnership.



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Observations

Benefits

Some of the observed benefits to core facility partnership include:

- Financial efficiencies stemming from economies of scale and the reduction of unnecessary redundancy
- Larger user bases can help to even out ebbs and flows of use (and related recharge revenue)
- Potentially increased scientific effectiveness as sharing may enable more cutting-edge facilities with expensive equipment and highly-skilled facility personnel (e.g., reducing the need to find multiple highly-skilled personnel to run similar specialized facilities across a metropolitan area like Chicago)
- Economies of limited laboratory space and the ability to make the case for core facility space

All of these benefits become increasingly important in the face of strained/limited institutional resources for investment in core facilities.

Observations

Models

- As stated previously, all three institutions have constantly evolving and changing portfolios of core research facilities – and the management and strategy structures related to facilities.
  - Core facilities in operation (and planned for the near future) range from common to unique (on campus and in region)
  - Varying models of core facility management/administration are in place
  - Varying business models (support strategies, subsidy, external major grant support) are in place
  - Varying institutional (and unit) cultures with respect to research are in place
  - Varying guidance on how rates for external users are derived and charged (from charging the internal rate to charging a marked up rate [most commonly, by adding the institution's negotiated F&A rate) – and thus different starting points with respect to normalized rates
- With regard to core facility partnership, there are several models that could be employed.
- As a near term goal, the institutions could identify a few cores where open access, sharing, or partnership could work; then, a model would exist to try out and learn from.
- Longer term, the most compelling core facility partnerships – in terms of enabling something significant and cutting edge in a manner that is scientific effective and financially efficient – are expected to result from strategic new cores (likely very expensive and/or very specialized) that any of the three institutions would have trouble developing on their own.
  - In this case, there would be a scientific research benefit to having a larger, stronger, more robust core with stronger personnel expertise and training.
  - For this kind of cutting-edge shared facility, investigators would more likely consider the obstacles to use 'worth it.'

Observations

Core facility partnership models

Discussions between the three institutions prior to this feasibility study identified several potential core facility partnerships models, listed below:

1. Cooperation among like cores across institutions to expand the repertoire of available technologies. This would be an example of ***Open Access to unique services*** not found at partner institutions.
2. ***Migration of users to existing core facility*** managed by one institution: Close existing cores that duplicate services at partner institutions and are struggling to meet expenses and provide open access to one core (or recommend outsourcing alternatives).
3. Shared Core: ***Establish new cores at one institution*** that would be managed by partner institutions through cooperative agreements (formal partnership).
4. ***Shared personnel***: A formal partnership situation in which oversight of core operations is located at one institution, but fully operational satellites exist at all locations. Core director would oversee education, training, quality and practice at all locations.
5. Establish formal partnership between institutions for ***movement of animals and supplies*** between core facilities. This would allow inter-institutional use of animals enabling researchers to capitalize on variation in technology availability or expertise
6. ***Shared clinical trials cores***: Open access to existing cores that provide clinical research-related services that are not available at partner institutions.

Observations

Challenges

We have organized reported and observed core facility partnership challenges and obstacles into several categories. In moving forward, the following challenges to increased inter-institutional use of core research facilities should be considered:

Geography and Transportation

- Distance and travel time between institutions (and between institutional campuses)
- Availability/accessibility and cost of parking for core facility users at the institutions
- Sample movement between institutions (depending on type, stability, and hazard level of samples and core facility)
- Cost, logistics, and predicted use of a research shuttle service between institutions

Observations

Challenges

Administrative and Financial Obstacles

- General core facility administrative and financial management
- Rate management
- Challenge of how to account for the budget ‘gap’ if some external academic users are charged the internal rate
- Potential for ‘price wars’ between comparable core facilities at partner institutions if not a standardization of rates
- Administrative burdens and cumbersome/clumsy systems for
  - Sign-up/reservations for external users
  - Account set-up for external users/institutions
  - Invoicing/billing external users
  - Collecting funds from externals users/institutions
  - Accounting systems
- University access cards for outside users (varies by institution)
- Core facility and building access (esp. after hours) (varies by location and institution)
- Challenge of educating/training business managers in the units (where turnover can be high) about core facilities and related collaboration/partnership

Observations

Challenges

Core Facility Operations and Management

- Access and priority obstacles:
  - Variable definitions of open (or shared) access and whether it equates to equal priority
  - Challenge faced by facilities of not reverting to local priority access if usage increases to the extent that there are capacity issues
  - Challenge of handling/managing legacy agreements that provide priority access to investigators who secured equipment for a facility and now get priority access or rate – as possible challenge to open access
- Usage obstacles
  - Cores at or near capacity – and for which a discrete additional investment could be made to expand – are reported to not be that great for partnering/shared access/etc.
  - Challenge of predicting the external (and thus total) use of an inter-institutionally shared core facility (and resultant challenges to planning, budgeting, and the core's overall business model)
- Trust obstacles:
  - Challenge of establishing/keeping faculty and other user trust in cross-institutional core facility
  - Barrier to external use created by a shared core facility not having a visible and transparent queue (esp. if there is not a built-up trust in the scheduling and access process for a given shared core)
  - Perception that paying attention to core facility Quality Assurance and Quality Control (QA/QC) means something is wrong, coupled with the need to find ways to demonstrate and communicate QA/QC to all users of an inter-institutionally shared core facility

Observations

Challenges

Core Facility Operations and Management (continued)

- Sharing/stability obstacles:
  - For cores that provide services that are increasingly becoming commercially available, the 'stability' of a core facility partnership may be more limited as users chose to use commercial services
  - More mature core facilities that offer routine, transactional services may seem to be good candidates for potential core facility partnership, but these are also services that can be provided outside the region, and thus there may be very little compelling reason for an investigator to focus on the Chicago area for such services
- Challenge of adequate space – e.g., where do visiting folks using facilities "hang their coats," prepare samples, etc. near facility? Sample prep space could be limiting step for some facilities
- Challenge of marketing – e.g., getting the word out about a given core facility partnership available to Chicago area investigators
- Obstacles related to personal conflicts between individuals (particularly at the core facility director position) can greatly hamper the potential for core facility partnership no matter how compelling other factors may be
- Each institution has its own 'process flow' related to clinical trials, and thus partnerships related to clinical trial related core facilities are likely to be difficult

Observations

Challenges

Cultural Obstacles

- Variable cultures of sharing across institutions, units, and disciplines
- Cultural challenge of convincing faculty that their labs can still conduct top-notch scientific research using core research facilities at another area institution.
- Challenge of forgoing the cache that stems from an individual institution having a particular core facility – with elements including institutional reputation, faculty recruitment, etc.
- Consolidating multiple similar cores (intra- or inter-institutional), unless it provides something particular new or different is likely to feel like something is being taken away; this may be very difficult for faculty (as well as administration and leadership), even with the current economic backdrop
- Negative impact on some faculty hiring of not having particular facilities/shared instruments within the institution

Observations

Challenges

Institutional Commitment, Strategy, and Shared Governance

- Challenge of providing long-term institutional investment and commitment in a multi-institutional core facility partnership
- Obstacles associated with guaranteeing long-term access (and presumably quality) to a core facility at another institution
- Challenge of shared governance of core research facility partnerships
- If an institution has an 'area of strength' and a related core facility, they may have multiple views on potential partnership, creating a challenge:
  - May want to share access to take advantage of this area of strength, or
  - May want not to share to maintain and build upon the strength differential that they have with competing research institutions
- Existing institutional academic and research partnerships and relationships with other institutions (outside of the three institutions) may make it difficult to develop core facility partnerships that only involve a subset of possible institutions; this said, too many partners may diffuse the relationship and increase related management and governance challenges
- Risks associated with potential changes to partnerships agreements (particularly if not formalized) – e.g., universities agree to partner and share a common core facility, but then one of the universities decides to develop a core of its own (with the potential resultant decrease in usage putting the health of the shared/common core facility in jeopardy)

Observations

Challenges

Research Risk and Institutional Policies, Procedures, and Compliance

- Obstacles related to individual and independent IACUC and IRB protocol processes (e.g., having to undergo approval at each institution and likely have a research collaborator at the other institution if interested in using facility)
- Barriers associated with NIH finance office/comptroller – e.g., confusion on how to split costs (for core facilities heavily supported by NIH center awards)
- Intellectual property (IP) considerations
- Overall institutional risk management challenges/differences in institutional risk tolerances related to core facility partnerships (e.g., the degree to which each institution 'worries' about liability or loss of potential recharge revenue stemming from charging internal rates to external academic users)
- Potential contamination of core facility equipment (e.g., tissue samples, bacteria)
- Obstacles related to cross-institutional liability – e.g., damage to equipment by visiting researcher
- Research safety of facility users (and related needs for common training) – e.g., laser safety
- Risks associated with inter-institutional transport of live cells, hazardous materials (biohazard, radioactive), etc.

Observations

Challenges

Research Risk and Institutional Policies, Procedures, and Compliance (continued)

- Uneven approaches to charging external users (esp. external academic users) across the three institutions (e.g., same as internal user, internal rate plus negotiated F&A rate)
- Uneven approaches to whether or not institutions try to limit external use of core facilities (e.g., to 20%)
- Challenges related to UIC being a public institution – and the real or perceived possibility that public funds may subsidize research by investigators at private institutions (i.e., NU and U of C)
- Confidentiality of data (e.g., industry research, human subjects) data that may be present at some core facilities
- Materials Transfer Agreement (MTA) – e.g., if such agreements are extend to all individuals within an institution, how to handle external users of a core facility?

Observations

Challenges

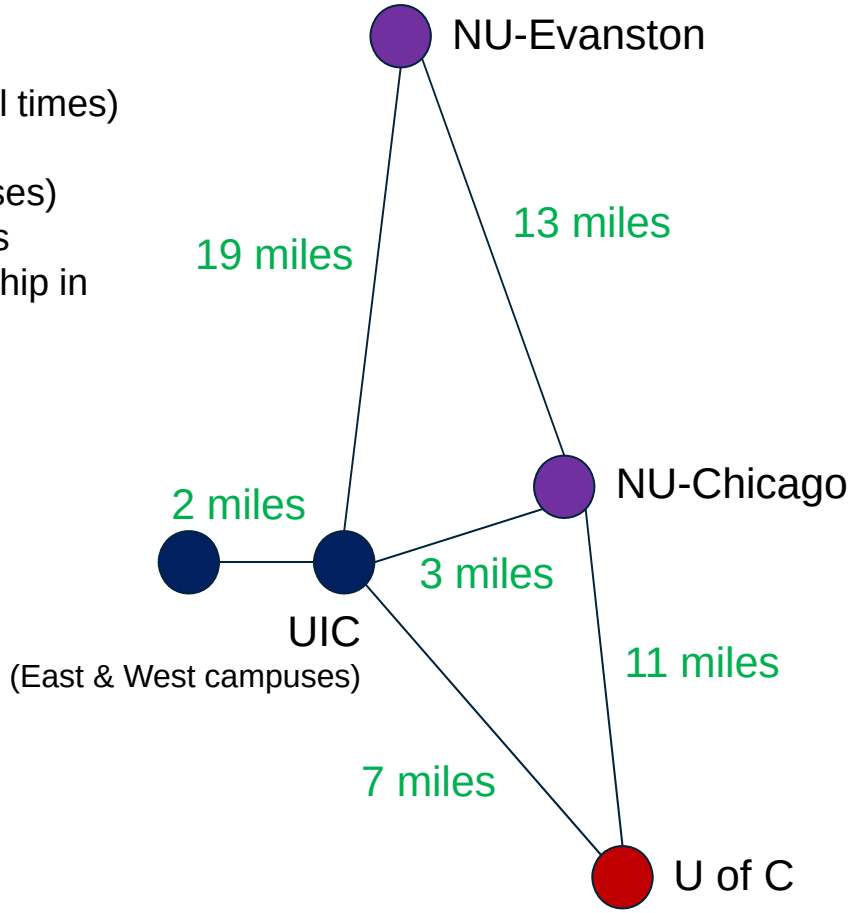
Unique Animal Facility Obstacles

- Paramount importance of, and significant challenge related to, managing and ensuring “health status” of research animals within an institution’s animal facility (and associated quarantine of animals from other institutions) – driven by regulatory committees and institutional faculty
- Lack of common animal facility definitions and language between institutions – e.g., definition and protocols related to “barrier” and other types of locations (e.g., “return facility,” “conventional housing”) – make discussions of core facility partnerships more difficult
- Significant obstacles associated with inter-institutional use of core facilities located within animal facilities/‘barriers’
- Challenge of finding room to accommodate transported animals (assuming animal health challenge is overcome)
- Standardization of per diem charges for animal housing across institutions is a challenge for potential core facility partnership

Observations

Approximate distances between institutions

The distances (and associated travel times) between the three institutions (and between separate university campuses) present opportunities and challenges associated with core facility partnership in Chicago.



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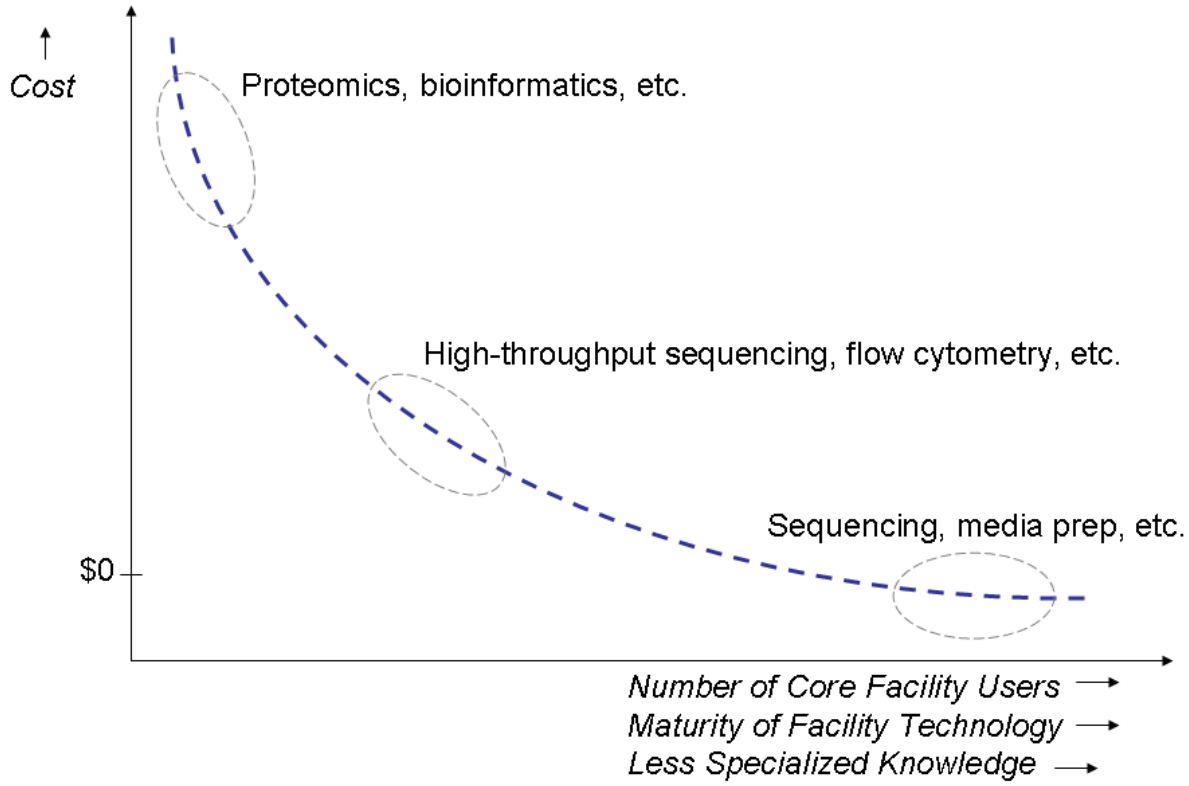
Observations

Schematic relationship between cost and facility characteristics

- The diagram below illustrates, schematically, a general relationship between required subsidies for selected core research facilities and the characteristics of the facilities and services provided.
- While some cores should be expected to require more or less institutional subsidy in order to provide high-quality, cost-effective services to researchers, overall, institutions expect to support their portfolios of core research facilities with some level of recurring, budgeted institutional investment.



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Observations

Chicago Biomedical Consortium

- Three institutions (NU, U of C, and UIC) receive varying forms of support from the Chicago Biomedical Consortium (CBC), a unique organization in the region.

> "The mission of the Chicago Biomedical Consortium is to stimulate collaboration among scientists at Northwestern University, the University of Chicago, and the University of Illinois at Chicago that will transform research at the frontiers of biomedicine."
>
> "Begun in early 2002 with support from a planning grant from The Searle Funds of The Chicago Community Trust, the CBC has been a forum for discussion among scientists from UIC, University of Chicago, and Northwestern.
>
> Three years of ongoing conversations and active collaboration have strengthened a common resolve among research scientists and administrative leaders and shaped a common goal to establish the CBC as a powerful agent to transform biomedical research and education in Chicago into a collaborative enterprise."

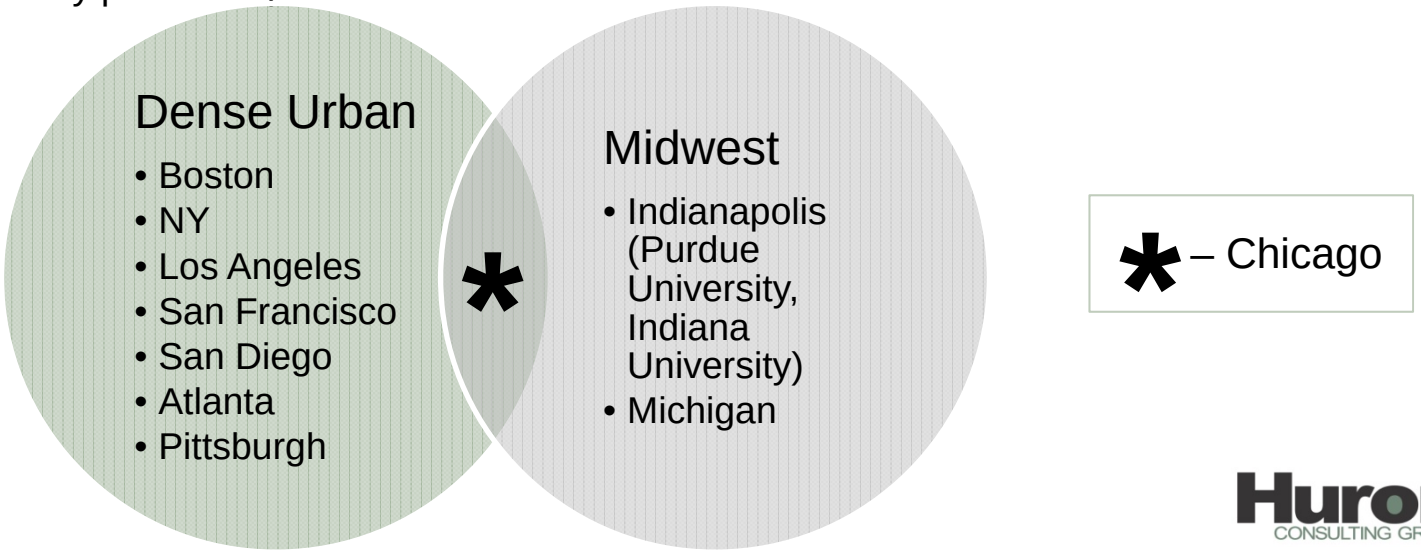
- While potential core research facility partnerships are ultimately the responsibility of the partnering institutions and their faculty, students, researchers, and other stakeholders, the CBC has played – and has the opportunity to play – a catalytic role in testing, seeding, and establishing mutually-beneficial mechanisms by which sophisticated, cutting-edge core research facilities can be effectively and efficiently made available to biomedical researchers in Chicago.

Source: CBC website (www.chicagobiomedicalconsortium.org).

Observations

Best practices and lessons learned

- We identified and explored several examples of other core research facility partnerships.
  - While none represented perfect models from which to draw significant, specific pointers, we have combined relevant lessons learned with information collected during our interviews and analyses at NU, UIC, and UIC to feed into the recommendations presented in the next section.
  - Additional exploration of these and other examples is likely to be beneficial in the future, as the three institutions explore near- and long-term core facility partnerships at more granular level.
- The Chicago MSA (Metropolitan Statistical Area), the third largest in the US by population (at just under 10 million), is home to several major research institutions.
- The three Chicago institutions (NU, U of C, and UIC) are at the interface between lessons learned from core facility partnerships in both dense urban areas and the Midwest:



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Observations

Peer institutions

Eight ‘peers’ were investigated at varying degrees of detail. These examples represent a range of organizational and funding models, and additional study will likely be beneficial to NU, U of C, and UIC.

- ***Center for Advanced Brain Imaging*** – Atlanta – Georgia Institute of Technology; Georgia State University
  Partnership driven by VPs for Research; MOU between Presidents to create a joint center/core facility that currently provides a 3T Magnetic Resonance Imaging system to investigate brain function and structure.
- ***Brain Imaging Research Center/Center for Brain Imaging*** – Pittsburgh – Carnegie Mellon University; University of Pittsburgh
  Brain Imaging Research Center jointly established by CMU and Pitt in 2002; Center for Brain Imaging to be operational in Spring 2010 and BIRC will be ramped down due to economic feasibility issues. Center complements the existing imaging facilities at the Pitt Medical School's Magnetic Resonance Research Center.
- ***La Jolla Interdisciplinary Neuroscience Center*** – San Diego – Burnham Institute for Medical Research; Salk Institute for Biological Studies; The Scripps Research Institute; University of California, San Diego
  Made possible by an NIH Blueprint for Neuroscience Research grant to support core technology facilities for researchers studying the nervous system.
  “The La Jolla Interdisciplinary Neurosciences Center brings together over 100 laboratories from the four San Diego institutions by expanding the range of core services and by allowing investigators access to many of each other's Core Facilities. By making these important Core Services available to the local Neuroscience community, the La Jolla Neurosciences Program hope to promote the study of how the nervous system works and develop treatments for nervous system diseases.”

Sources: CABI website (www.cabiatl.com), BIRC website (www.birc.pitt.edu), La Jolla website (www.lajollaneuroscience.org), interview.

Observations

Peer institutions

- ***New York Structural Biology Center*** – New York – 501(c)(3) with 10 institutional members (Albert Einstein College of Medicine; City University of New York; Columbia University; Memorial Sloan-Kettering Cancer Center; Mount Sinai School of Medicine; New York University; The Rockefeller University; Wadsworth Center of the Department of Health; Weill Medical College of Cornell University; State University of New York)
- ***Purdue-Indiana Cancer Center Shared Resources Partnership*** – Indianapolis – Purdue University, Indiana University

  MOU between sponsored programs directors for investigators to have joint access to each others' cancer center shared resources. (Note that Purdue's cancer center is one of only two NCI-designated cancer centers on an academic campus that are not affiliated with a medical center [MIT is the other], and thus the shared resources at the Purdue and IU cancer centers are somewhat complementary.
- ***AMDeC (Academy for Medical Development and Collaboration)*** – New York – over two dozen member institutions, including academic medical centers, teaching hospitals, and biomedical research institutions
  - "AMDeC has developed several shared core research facilities for advancing genomics research. These cores include the Bioinformatics Core Facility, and the Microarray Resource Center. The goal at the outset of AMDeCs core research facilities program was to increase efficiencies across our affiliated institutions. Rather than having each institution individually invest in costly technologies, our research cores allow them to maximize efficiency by providing shared access to these high-demand resources."
  - "The increased need for data standardization and sharing throughout the biomedical research community has led AMDeC to revamp the original goals of the core research facilities program. Our research cores have become central repositories for standard microarray data (including the single largest collection of microarrays in the country), new bioinformatics software and tools and general platforms for cross-institutional collaboration in areas such as data generation, analysis and sharing."

Sources: NYSBC website (www.nysbc.org), AMDeC website (amdec.org), interview.

Observations

Peer institutions

- ***BIOFAB: International Open Facility Advancing Biotechnology*** – San Francisco/Northern California – University of California, Berkeley; Stanford University
  - "The new BIOFAB: International Open Facility Advancing Biotechnology (BIOFAB), with two years of funding from NSF and matching support from founding partners, Lawrence Berkeley National Laboratory (LBNL) and the BioBricks Foundation (BBF), aims to produce thousands of free standardized DNA parts to shorten the development time and lower the cost of synthetic biology for academic or biotech laboratories."
- ***Core Technology Alliance*** – Michigan – Van Andel Institute, Michigan State University, University of Michigan, Wayne State University, Grand Valley State University, Western Michigan University, Kalamazoo Valley Community College
  - "CTA Corp. is a collaborative network of technologically sophisticated, fee for service core facilities located within the state of Michigan"
  - "501(c)(3), non-stock membership organization owned equally by founding and non-founding members. Each member institution owns the assets and employs the personnel of its own core facilities."
  - Funded by tobacco settle money; hub and node structure
  - Identified weaknesses:
    - Lack of long term funding for personnel and equipment
    - Lack of external funding sources
    - Reporting/oversight burden of institutions high; indirect rate low
    - Hub and node structure had some service redundancies
    - Core director motivations directly proportional to funding level

Sources: BIOFAB website (www.biofab.org), Swiatek, P. "Sharing and Networking Core Facilities: Michigan's Core Technology Alliance," Presentation at AIRI Meeting (October 2009).

Observations

Federal agency perspective

- To complement our interviews of stakeholders at the three institutions, we held initial discussions with selected personnel from federal research funding agencies (specifically, the NIH and NSF) on the subject of core research facility partnership.
- As we recommend later in the report (see Rec. II-1), the three institutions should plan to conduct additional, more detailed discussions with these agencies about the federal funding programs that support both core (or shared) instrumentation (e.g., NIH SIG, NSF MRI) and resources (e.g., NIH/NCI Cancer Centers, NSF MRSECs).
- Our initial discussions confirmed our understanding that ***while federal research funding agencies have started to think about core research facility partnership*** – demonstrated most clearly by a July 2009 workshop described on the next slide – ***there are still many uncertainties about what this means for the agencies' programs and the universities they support***.
- In principle, the federal agencies support efforts to explore inter-institutional core facility partnerships and sharing – and reported this during interviews – but the agencies admit being at an early stage in the process and having very little experiences to date from which to draw lessons learned or best practices.
- Along these lines, it was reported that while some federal research center programs (e.g., NSF MSEC) have begun to encourage the general concept of core facility partnership, there are very few examples on which to judge success.
- Furthermore, it was reported that the institutional barriers to core facility partnership – one of the goals of this study – are currently poorly understood by the funding agencies.

Sources: Discussions with selected senior NIH and NSF personnel.

Observations

Federal agency perspective

NIH Workshop

- In July 2009, the NIH NCRR hosted a national workshop on the “Efficient Management and Utilization of Core Facilities.”
- One of the stated purposes of this workshop was to “raise options to maximize the use and efficiency of core facilities.”
- For example, some of the benefits and challenges of regional cores were discussed.
- Representatives from Chicago area institutions attended this workshop in the DC area.

NIH Notice

- In addition to the workshop, a recent NIH Notice of the “Availability of Recovery Act Funds for Administrative Supplements to Support Core Consolidation” included “Merging core facilities at different institutions into a single facility that served the needs at both institutions” as an example situation responsive to the Notice.
- While it remains to be seen whether awards of this nature will be made, approximately $15 million will be obligated to support requests to this one-time opportunity supported by Recovery Act funds.

Sources: Final workshop report, “The Efficient Management and Utilization of Core Facilities,” (October 2009); “NIH Announces Availability of Recovery Act Funds for Administrative Supplements to Support Core Consolidation,” NOT-RR-10-001, 13 January 2010 receipt date; discussions with selected senior NIH and NSF personnel.

Observations

Federal agency perspective

- Some of the most relevant observations from our initial discussions follow.
- These observations focus on the NCI Cancer Center and NSF MRI programs.

NCI Cancer Center program

- It was reported that within the NCI Cancer Center program, there are no objections to the concept of shared, inter-institutional access to core facilities but that the implementation of such a model could be difficult from an NIH/NCI logistics point of view.
- Some of the potential benefits of inter-institutional sharing of core facilities reported by NCI include efficiencies of scale and the potential to increase inter-institutional research collaboration between investigators.
- Along these lines, the NCI has considered a few options of how it might fund core partnerships involving its Cancer Centers:
  - In one option, a subcontract would be made by the awardee institution to the partner institution (not favored by the NCI because of the extra costs associated with subcontracts).
  - In another option, all the funds would be directed to the center providing the shared service (with the challenge of not knowing in advance what the usage would be across institutions reported as expected to force reviewers to have to guess based on submitted estimates).
  - In a third option, the NCI would make a supplement or utilize another award mechanism to an institution to allow it to purchase services from another institution with an approved resource.

Sources: Discussions with selected senior NIH and NSF personnel.

Observations

Federal agency perspective

- The NCI currently appears to prefer the third option and reported that they would like to test it out via a separate supplement before putting it in the Cancer Center Support Grant RFA.
- This said, the NCI reports that it hasn't had the funds to do so yet.

<u>NSF MRI (Major Research Instrumentation Program) program</u>

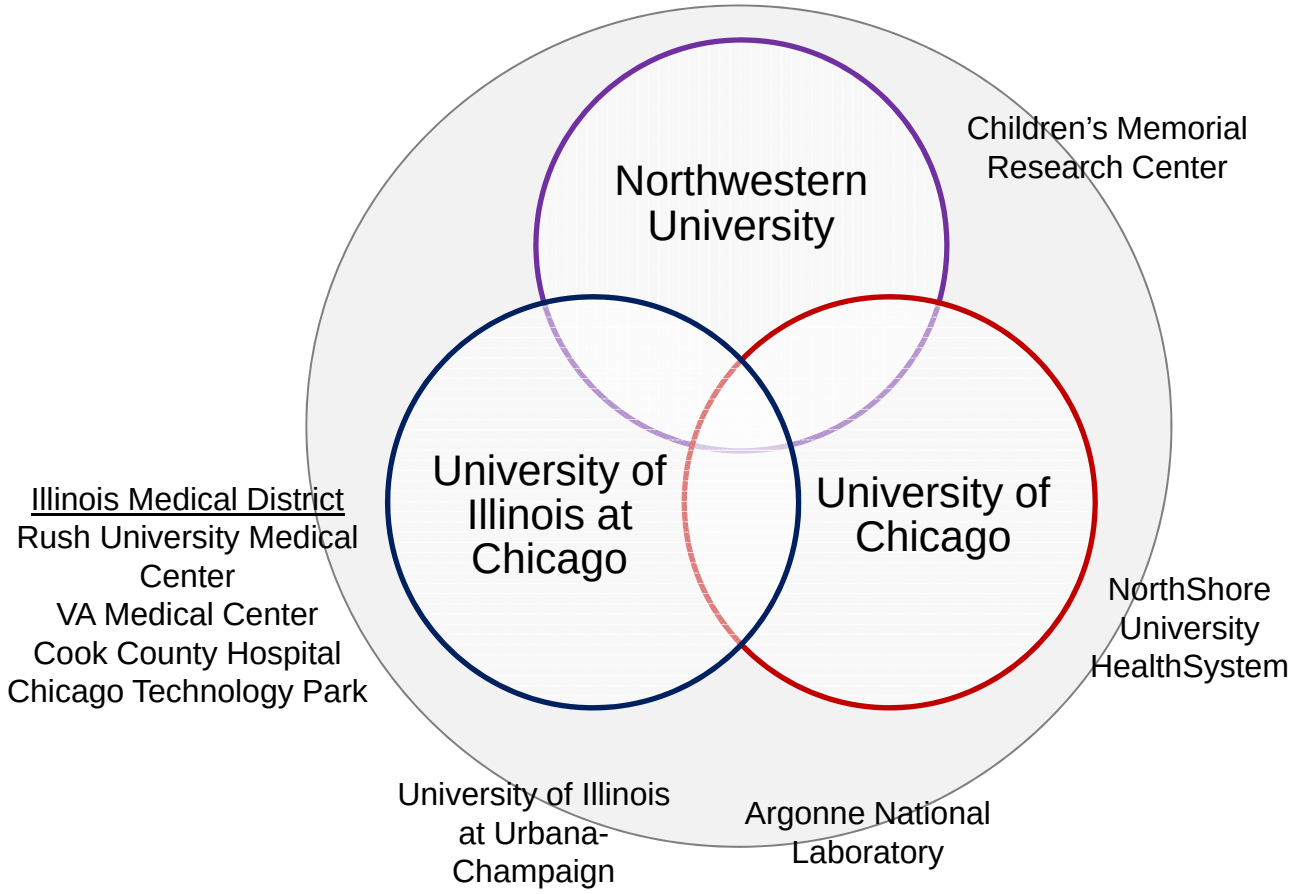
- NSF's MRI program represents a significant potential source for equipment for university core research facilities, with an annual budget of approximately $100 million.
- It was reported that NSF MRI proposal success is a matter of putting together the right kind of proposal regardless of whether or not shared cores are part of it.
- We discussed a possible trade-off that might face reviewers in which a proposed instrument shared between institutions might be able to demonstrate additional demand and usage but might also require the development of a well-defined and robust management plan presenting how access, quality, feedback, and related aspects will be handled.
- It was also reported that as one approaches the maximum allowed award size on any given instrument (in the range of $4 to $6 million), a size is being reached where inter-institutional sharing would make sense and may be necessary to be competitive for funding.

Sources: Discussions with selected senior NIH and NSF personnel.

Observations

Institutional collaborations

Despite this study's focus on NU, U of C, and UIC, existing collaborations between the three institutions and other academic and research partners may necessitate broader future discussions and explorations.



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Recommendations

Recommendations

Overview

- Many of the challenges associated with core facility partnership addressed in the previous Observations section have inherent, connected recommendations – i.e., to overcome the challenge.
- This section focuses on additional, broader recommendations that improve the likelihood of productive core facility partnerships that benefit academic research at the three institutions (NU, U of C, and UIC).

Overall, the feasibility of core research facility partnerships between the three institutions is strong.

This said, such partnerships should be based on specific, strategic opportunities and needs and should be supported by increased joint vision and decision-making and enhanced facility operations and management structures, as addressed on the following slides.

Recommendations

Overview

Our recommendations related to NU, U of C, and UIC core research facility partnership feasibility are organized into four functional areas.

Each of these areas is explored in more detail on the following slides.

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Recommendations

Overview

- While our charge was to explore the full range of possible core facility partnership models and to not be limited to the six models identified by the three institutions prior to our study (see slide 19), the table below offers summary statements of the perceived feasibility for these specific models.

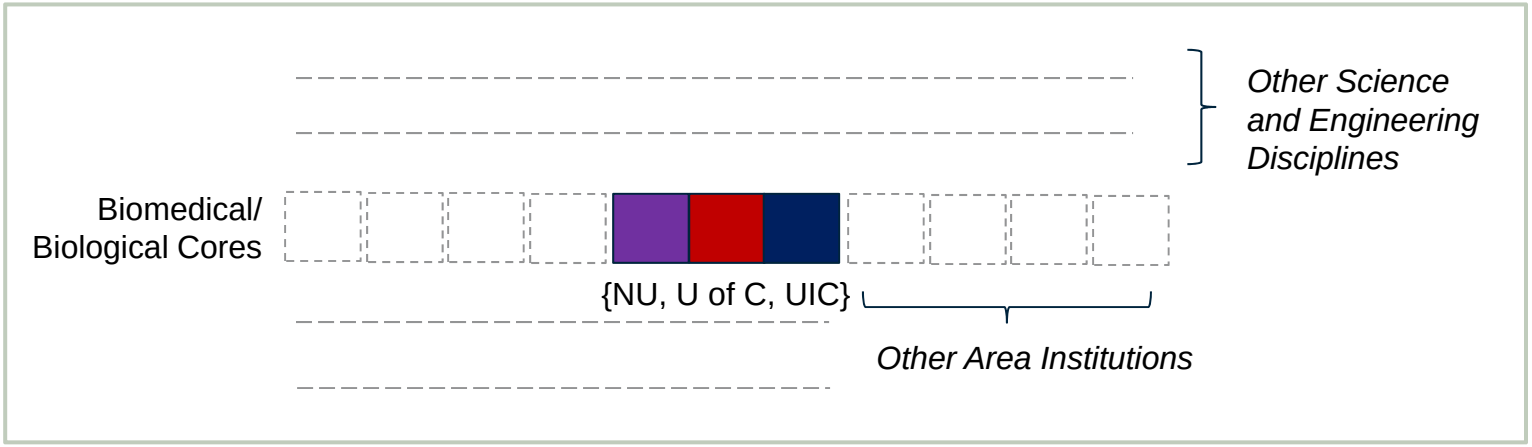
Summarized Feasibility Assessments of Six Selected Core Facility Partnership Models	
Example Partnership Model	**Summary Thoughts on Perceived Feasibility**
1. Open Access to unique services	Moderate feasibility, provided that the services are perceived to be high-quality and well-managed and that open access makes sense to the local needs of all institutions
2. Migration of users to existing core facility	Moderate feasibility, provided that the service is unique enough and that the economics and usage concerns are severe enough that shutting down a core is a consideration
3. Establish new cores at one institution	High feasibility, provided that the core facility is expensive and provides a unique, cutting-edge service for which investigators are willing to travel and provided that governance, investment, and management issues are jointly addressed
4. Shared personnel	Moderate feasibility, provided that high-quality services can be delivered (with built-in shared governance to offer some guarantee) across a given core area using such a model
5. Movement of animals and supplies	Very low feasibility, especially considering significant associated costs, research risks, and cultural barriers
6. Shared clinical trials cores	Low feasibility, driven largely by diverse institutional approaches to clinical trials management

Notes: See slide 19 for additional background on these selected models/case studies. In addition, slides 20-28 present a consolidated picture of potential obstacles to core facility partnership that cut across (and beyond) these models.

Recommendations

Overview

- While our charge was focused on selected biomedical/biological core research facilities, some of our recommendations extend beyond disciplinary boundaries and are thus applicable to core facilities in the physical sciences and engineering (S&E), including key areas such as materials and nanoscale S&E.
- In addition, while our charge was on NU, U of C, and UIC, there are several other institutions in the Chicago area (and beyond) that are potential partners for joint core facility activities (as addressed in the Observations section), and it may be possible to expand some of our recommendations to other institutions, as deemed appropriate.



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Recommendations

Area I recommendations

I. Joint Vision, Decision-Making, and Investment

I-1. Senior leadership from the three institutions should strongly consider establishing a generalized, overarching core facility partnership agreement or Memorandum of Understanding (MOU).

I-2. The three institutions should begin exploring and moving toward limited joint decision-making and investment in large-scale, strategic core research facilities.

I-3. Senior leadership from the three institutions should consider conducting a limited-time trial of charging internal rates to users from the other institutions.

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Recommendations

I. Joint Vision, Decision-Making, and Investment

I-1. Senior leadership from the three institutions should strongly consider establishing a generalized, overarching core facility partnership agreement or Memorandum of Understanding (MOU).

- The agreement will serve to communicate institutional interest and commitment to research collaboration generally and core facility partnership more specifically.
- The agreement should likely be made between the Vice Presidents/Chancellors for Research or Presidents/Chancellors at NU, U of C, and UIC.
- The document will establish general core facility partnership operating principles, allowing more detailed agreements/MOUs to be established for specific core facility partnerships.
- The agreement will also serve to increase core facility visibility among investigators at research institutions in the Chicago area and among federal funding agencies (such as the NIH and NSF).
- We recommend that the agreement be jointly drafted by key core facility leadership at the three institutions (i.e., Drs. Hockberger and Hendrickson and Ms. Auger), with help from their institutions' General Counsels, and delivered to the VPs/VCs for Research for comments and suggestions.

Recommendations

I. Joint Vision, Decision-Making, and Investment

I-2. The three institutions should begin exploring and moving toward limited joint decision-making and investment in large-scale, strategic core research facilities.

- Much of the decision-making and investment related to core facilities at the three institutions is currently ad hoc, and even intra-institutional core facility coordination is challenging.
- This said, there are considerable opportunities to more strategically align intra- and inter-institutional decisions and investments related to significant core research facilities.
- This is considered especially important because it is predicted that the greatest opportunities for 'win-win' core facility partnerships will be new, very large, strategic cores that are truly enabled and strengthened by multi-institutional partnership and investment.
- For these compelling types of core facility partnerships, it is expected that researchers will most be willing to navigate the associated access hurdles (e.g., logistics, travel), hurdles that can be reduced but will remain present.
- Several stakeholders reported that, ideally, the three institutions would have input into technology purchases and investments at each others' campuses;.
- While this is unlikely in the short- to medium-term, the potential for related joint processes and mechanisms should be explored.

Recommendations

I. Joint Vision, Decision-Making, and Investment

- A small, high-level ***Inter-Institutional Core Advisory Committee*** should be created.
- This committee should be based loosely on the Science Policy Council established for Argonne.
  - "The Science Policy Council is responsible for guiding the interactions and scientific directions of Argonne and its Illinois academic partners and for addressing such issues as joint appointments, student and faculty access, and the development of new scientific directions for Argonne." Recent membership:
    - Larry Danziger, Vice Chancellor for Research, University of Illinois at Chicago
    - Jay Walsh, Vice President for Research, Northwestern University
    - Donald H. Levy, Chief Executive Officer, UChicago Argonne, LLC and Vice President for Research and for National Laboratories, the University of Chicago
    - Eric D. Isaacs, President, UChicago Argonne, LLC and Laboratory Director, Argonne
    - Ravi Iyer, Vice Chancellor for Research, University of Illinois at Urbana-Champaign
- Among other potential topics, the following elements related to exploring and moving toward limited joint decision-making and investment in large-scale, strategic core research facilities should be considered:
  - Core facility strengths and needs inventory
  - Shared instrumentation proposal analysis
  - Faculty start-up analysis
  - Joint federal program submission

Source: Science Policy Council website (www.uchicagoargonnellc.org/about/science-policy-council.htm).

Recommendations

I. Joint Vision, Decision-Making, and Investment

- A project manager should be appointed to facilitate the operations of the committee and to help the committee work closely with the *Inter-Institutional Core Facility Partnership Coordination Committee* (suggested in Rec. II-1) to carry out these activities.
- <u>Core Facility Strengths and Needs Inventory</u>
  - It is recommended that each institution conduct an inventory of its core research facility strengths and related needs.
  - Each institution's inventory should be presented to/shared with the other institutions to establish a better knowledge base with which leadership can make more informed, strategic decisions about facility funding and cost sharing for major instrumentation or center proposals.
- <u>Shared Instrumentation Proposal Analysis</u>
  - It is recommended that each institution conduct an analysis of shared instrumentation proposal submissions to federal agencies (e.g., NSF MRI, NIH SIG) over the past few years.
  - The goal should be to gather information about successes, failures, and lessons learned that can inform future proposal development endeavors.
  - A reasonable, agreed upon mechanism for sharing these insights among the three institutions should be explored.

Recommendations

I. Joint Vision, Decision-Making, and Investment

- Faculty Start-Up Analysis
  - It is recommended that each institution conduct an internal analysis of faculty start-up packages over the past three years with an emphasis on major pieces of equipment (shared and unshared) and how they were funded.
  - While it is highly unlikely that institutions will be willing to share this information, it will serve as a valuable internal knowledge base from which future individual and joint decisions and investments related to core research facilities can be made.
- Joint Federal Program Submission
  - It is recommended that the three institutions take steps to encourage joint planning for future inter-institutional proposals to federal agencies requesting support for major, strategic pieces of shared equipment (and/or for key personnel) for significant core facilities.
  - To facilitate this, the three institutions might consider creating a modest shared pool of institutional matching/cost sharing funds for collaborative proposals of this kind.

Recommendations

I. Joint Vision, Decision-Making, and Investment

I-3. Senior leadership from the three institutions should consider conducting a limited-time trial of charging internal rates to users from the other institutions.

- Exceptions should be made in selected cases where immediate normalization of rates is predicted to possibly lead to ‘price wars’ that will be detrimental to a facility’s operations
- The institutions should mutually agree to a reasonable trial period and should consider a duration of one year.
- Prior to this trial, the institutions should set up the necessary processes to allow the collection of data necessary to analyze the ‘net flow’ of resources at the end of the trial.
- During the trial period, the institutions should conduct detailed accounting of the investment/subsidy ‘net flows.’
- There should not be an expectation that any inter-institutional fund exchange will take place at the end of the trial period to “cover” these net flows; instead, the information learned will be helpful in setting future inter-institutional core facility partnerships
- The trial period should also be used to conduct explorations of the key governance, management, and administrative processes related to core facility partnership, as addressed in other recommendations.

Recommendations

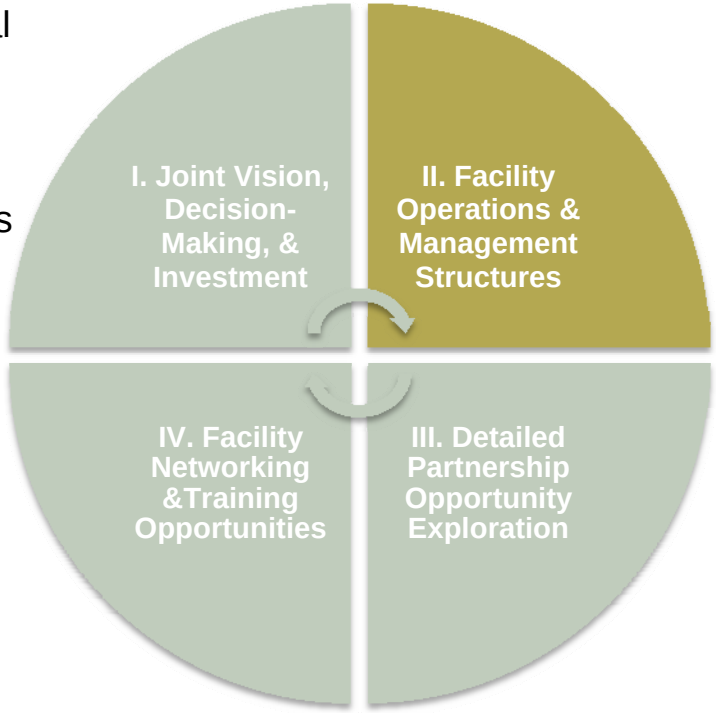
Area II recommendations

II. Facility Operations and Management Structures

II-1. The three institutions should continue working together to explore the operational and strategic aspects of core facility partnership via an inter-institutional coordination committee.

II-2. The three institutions should establish a broad inter-institutional working group focused on core facility partnership administrative issues.

II-3. Each institution should devote increased attention to more rigorous core facility rate development and related compliances policies and procedures.



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Recommendations

II. Facility Operations and Management Structures

II-1. The three institutions should continue working together to explore the operational and strategic aspects of core facility partnership via an inter-institutional coordination committee.

- An ***Inter-Institutional Core Facility Partnership Coordination Committee*** should be formed as an organizational structure.
- It is recommended that the committee should meet semi-annually (or more frequently as needed, particularly during initial six months of operation).
- The three institutions should jointly finalize the exact structure of this coordination committee; one possible structure would be a nine-member committee, with three members from each of the three institutions.
- Possible membership of the inter-institutional committee might include key core facility leadership at the three institutions (i.e., Drs. Hockberger and Hendrickson and Ms. Auger) coupled with key core facility leadership from the medical school, leadership from major federally-funded centers (e.g., NCI Cancer Centers, CTSAs), and/or the key core facility leadership from the physical sciences.
- The committee should focus its initial efforts on three key core facility partnership topics:
  - Shared governance
  - Quality assurance and quality control
  - Federal agency research interaction
- Over time, changes in the focus of the committee are expected.

Recommendations

II. Facility Operations and Management Structures

Shared Governance

The committee should explore the diversity of faculty advisory committees across the campuses and their involvement/ability to affect change within facilities when there are problems with a core's services. The committee should work to 'map out' a possible range of inter-institutional shared governance models for individual shared core facilities, with a goal of knowledge sharing and some normalization between these models.

Quality Assurance and Quality Control (QA/QC)

The committee should work to develop ways in which quality can be measured and communicated across institutions to create and maintain trust in core facilities operating in a partnership model – and to convince faculty and other key stakeholders that quality is strong and change can be affected if needed.

Federal Agency Research Interaction

The committee should develop plans to bolster active, joint interactions with federal program officers, including the NIH NCI (Cancer Centers) and NCRR (SIG) and NSF MRI programs. These interactions should build off of existing relationships and the institutions' participation in the July 2009 NIH/NCRR Workshop on "The Efficient Management and Utilization of Core Facilities." Among other beneficial outcomes, these efforts should be viewed as an opportunity to 'market' Chicago area collaborative core research facility capabilities, learn, and be in a position to more effectively capitalize on new funding programs related to core facility partnership or regionalization.

Recommendations

II. Facility Operations and Management Structures

II-2. The three institutions should establish a broad inter-institutional working group focused on core facility partnership administrative issues.

- An ***Inter-Institutional Core Facility Partnership Administrative Issues Working Group*** focused on core facility partnership administrative issues should be created.
- This working group can serve to:
  - Share institutional processes and procedures
  - Brainstorm on a range of administrative issues related to core facility partnership (examples listed below)
  - Report to the inter-institutional coordination committee
- Issues include:
  - Accounting
  - Billing
  - Reservation systems
  - Technology solutions
  - Regulatory compliance
- This group might explore working through local participants on the Cancer Center Administrators Forum (CCAF) for additional outside perspective and best practices or lessons learned.

Recommendations

II. Facility Operations and Management Structures

- As an additional charge, the working group should explore how best to create and roll out a program to train academic unit business managers about core research facility administrative issues.
  - Reported concerns about high turnover among unit business managers/administrators and the fact that these individuals often have roles and responsibilities that extend far beyond research and core facilities make such training important.
  - At a base level, a website that describes inter-institutional financial transactions and other administrative procedures would be useful.
- The working group should report to individual institution's designee…

Recommendations

II. Facility Operations and Management Structures

II-3. Each institution should devote increased attention to more rigorous core facility rate development and related compliances policies and procedures.

- Increased attention should include rates charged to external academic and industry users.
- Communication between the institutions aimed at some degree of ‘normalization’ between these policies and procedures should be increased.
- For all cores, at each campus, institutions should strive to provide guidance on rate development and specific guidance on developing external rates – to the extent to which policy, practice, etc. doesn’t already provide such guidance.
- The three institutions all have different approaches (and policies, or lack thereof) to charging rates to external users (academic and industrial).
- Varying degrees of knowledge of the underlying costing policies and federal regulatory environment adds to this confusion (even on campus, let alone across campuses).

Recommendations

II. Facility Operations and Management Structures

- It is important to understand and be knowledgeable of the actual operating costs associated with each service center for several reasons, including that such knowledge provides the basis for calculating a true unit billing rate that assures the service center will operate on a break even basis.
- The process involved includes:
  - Identifying all expenditures and funding sources for the service center operation, whether federal, state, or some other source.
  - Adjusting the total costs of operations and subsequent fully costed billing rate to exclude all federal funded costs and unallowable costs per the college and university cost principles contained in OMB Circular A-21.
- Although most service centers generally do not recover the full costs of operations, a more accurate picture of the subsidy is easier to determine when such a process is followed.

Recommendations

II. Facility Operations and Management Structures

- Generally, not having accurate service center rates, aside from being a compliance risk, is symptomatic of the unit and institution not really understanding the true costs required to operate their service centers.
- Since most service centers do not recover the full costs of their operations, the balance is made up via unit and institutional subsidies (explicit and hidden; perhaps quite large in scale) and external sources (e.g., core grants, state lines to support positions).

Lack of information about the actual operating costs of service centers hampers strategic decision-making and investment related to these important components. In turn, and given the limited resources that units and institutions have to invest in their portfolios of service centers, this can negatively affect the ability to strategically invest in the centers with the greatest benefit to the institution. The following service center elements are likely to be sub-optimal:

- Effectiveness
- Efficiency
- Financial performance
- Accessibility
- Adaptability
- Contributions to faculty and the research enterprise

Recommendations

Area III recommendations

III. Detailed Partnership Opportunity Exploration

III-1. The three institutions should continue to encourage joint discussions and explorations about shared access and partnerships related to core facilities that involve research animals.

III-2. The three institutions should undertake more detailed explorations of specific core facility partnerships, opportunities associated with several identified core facilities.

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Recommendations

III. Detailed Partnership Opportunity Exploration

III-1. The three institutions should continue to encourage joint discussions and explorations about shared access and partnerships related to core facilities that involve research animals.

- The significant challenges and obstacles that face potential core facility partnerships involving research (or laboratory) animals make the feasibility for such partnerships low.
- Still, continued joint discussions and explorations are valuable.
- As a core part of these discussions, emphasis should be placed on better understanding regulatory committee processes at the three institutions and exploring the possibility of joint reciprocity between the three institution's IACUCs and IRBs.
- Additional exploration of the degree to which the three institutions possess core research facilities related to research animals that are truly unique in the city and region should be conducted.
- Along these lines, two particular models of core facilities set up outside of animal facility 'barriers' were identified as worthy of additional exploration as possible candidates for inter-institutional partnership:
  - ***Advanced molecular imaging cores***
  - ***Transgenics cores***

Recommendations

III. Detailed Partnership Opportunity Exploration

III-2. The three institutions should undertake more detailed explorations of specific core facility partnerships, opportunities associated with several identified core facilities.

- These explorations should be led by core facility oversight/management personnel at each institution (i.e., Drs. Hockberger and Hendrickson and Ms. Auger) and should intimately involve core facility personnel and key users as explorations progress.
- Among several other factors, the explorations should strive – at a more granular level – to uncover the truly unique nature of each facility and the expected outcome (in terms of usage, rates, etc.) of various partnership models.

While it is predicted that the greatest opportunities for 'win-win' core facility partnerships will be new, very large, strategic cores that are truly enabled and strengthened by multi-institutional partnership, there appear to be several existing or emerging core facilities at one or more of NU, U of C, and UIC for which there may be beneficial partnerships.

- Specific core facility partnerships opportunities should be explored on a case-by-case basis, based on financial, strategic, scientific, logistical, regulatory, personnel, and other considerations.

Recommendations

III. Detailed Partnership Opportunity Exploration

Ten core facilities (presented alphabetically below) were identified as worthy of additional exploration. The table below illustrates the overlap between these identified core facilities and the case studies for exploration identified by the three institutions prior to this project.

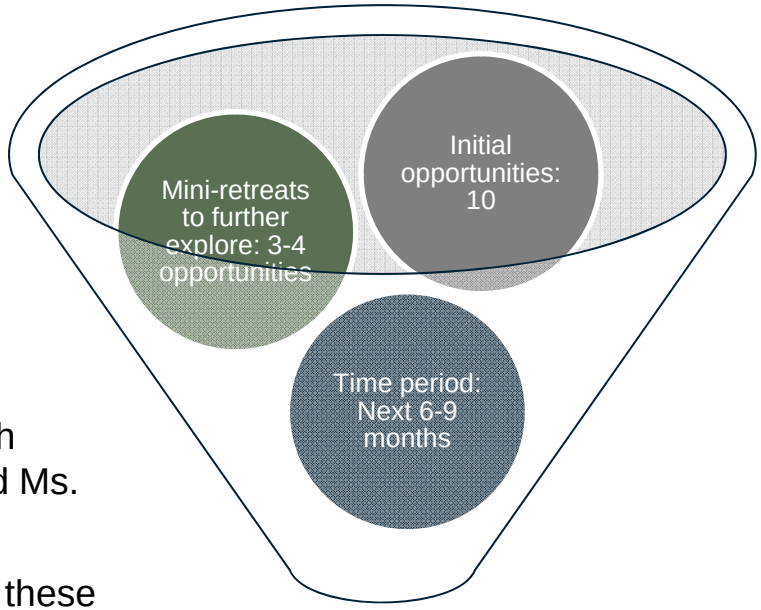
Selected Chicago Core Facilities to Explore for Potential Partnership	
Core Facilities (alphabetical)	**Identified Case Study for Exploration (prior to this project)***
Behavioral phenotyping cores	
Biospecimen cores [1]	
CryoEM cores	"Joint training and technical support (e.g., cost-sharing and oversight) for CryoEM by support staff at the University of Chicago and Northwestern University for researchers at the three institutions"
Drug discovery cores	
Electronics, instrument, and machine shops	"Joint sharing and managing of a single High-End Instrument and Electronics Shop that will serve researchers at all three institutions"
Functional genomics cores	
Microfabrication facilities	
Monoclonal antibody cores	
Next gen sequencing cores	"Open access to the Next-Gen Sequencing Technologies at Northwestern University for investigators from all three institutions"
Non-laboratory cores [2]	"Open access to the Clinical Outcomes Core at Northwestern University for researchers at the three institutions"

Note: * – Identified by NU, U of C, and UIC during the project's work scope discussion. [1] Elements may include biospecimen bank, specimen processing core, specimen retrieval system, and biomedical informatics core. [2] Elements may include biostatistics, outcomes research, research ethics support, and survey development.

Recommendations

III. Detailed Partnership Opportunity Exploration

- For a limited number of these opportunities, the three institutions should strongly consider holding joint, facilitated mini-retreats to collaboratively explore the following elements:
  - Current state of the core facility
  - Needs and pressures facing facility
  - Possible partnership models
  - Additional needed information (e.g., information about each institution's strategic plans in this technology/core area)
- Core facility oversight/management personnel at each institution (i.e., Drs. Hockberger and Hendrickson and Ms. Auger) should oversee these mini-retreats.
- As a tool to use during this process and in the future, these individuals should work together to create a draft checklist/ decision tree to help identify those cores that are likely best positioned for partnership opportunities.
- This checklist/decision tree should take into account the considerations identified above for case-by-case identification of partnership opportunities (e.g., financial, strategic, scientific, logistical, regulatory, personnel).



More detailed plan for capturing strategic partnership opportunities

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Recommendations

III. Detailed Partnership Opportunity Exploration

- Additionally, parallel to these explorations, efforts should be increased at each institution to strengthen the online information presented about core research facilities.
  - Faculty, leadership, and administrators report having a very difficult time knowing what kind of core research facilities are available at other institutions and what the access policies may be, especially since it's a 'moving target' with each core evolving over time.
  - A process such as the one schematically depicted below should be undertaken, under the ultimate direction of the inter-institutional coordination committee (link to Rec. II-1).

- Improve core research facility data and online presentation at each institution.
- Coordinate with the other institutions to 'normalize' information, format, and presentation.
- Link websites and explore other means to share core facility information across the three institutions.

Robust, Standardized, Inter-Institutional Clearinghouse of Shared Facilities / Instrumentation

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Recommendations

III. Detailed Partnership Opportunity Exploration

- Despite the potential benefits of core facility partnerships involving all three of the institutions – NU, U of C, and UIC – there may be cases where a partnership between two institutions makes more sense, and these opportunities should be actively explored.
- Examples of cases where this situation may emerge include:
  - One institution has already made a significant, strategic investment in a particular core/technology and the institution's core is already near capacity, whereas the other two institutions have no local access to an indentified key technology/service.
  - One institution has developed a significant, strategic core facility that is tightly focused on a particular niche in which investigators at the institution – but not at its Chicago area neighbors – have high demand; the other institutions may wish to partner on a similar core with less of this niche focus.

Recommendations

Area IV recommendations

IV. Facility Networking and Training Opportunities

IV-1. The three institutions should explore additional opportunities to facilitate inter-institutional networking between core facility directors and users.

IV-2. The three institutions should continue to explore opportunities to use core facilities to facilitate and enable cross-institutional educational and training opportunities.

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Recommendations

IV. Facility Networking and Training Opportunities

IV-1. The three institutions should explore additional opportunities to facilitate inter-institutional networking between core facility directors and users.

- While some core facility directors report having formal and informal opportunities to interact and network with facility directors at other Chicago area core facilities (e.g., flow cytometry and a related Chicago Users Group [ChUG], Proteomics Monthly Club), many report having no such opportunities.
- Several approaches should be explored to help core facility directors and users better interact and network, including the following:
  - Joint meetings between core directors/personnel (perhaps linked to joint user groups)
  - Joint user groups
    - Inter-institutional user groups could explore problems, issues, and solutions associated with the facilities' technologies and services.
    - Membership should include PIs but also graduate students and postdocs.
    - There is value to collaborative, science-focused seminars/discussions (e.g., what did the facility enable and what went right and wrong on recent projects that utilized the shared facility) in addition to discussions focused on facility 'nuts and bolts.'
  - Joint core facility Open Houses
  - Networking opportunities in the emerging Midwestern Association of Core Directors (MACD)
- Resources should be provided to enable and facilitate these networking approaches; such investments are not expected to be significant.

Recommendations

IV. Facility Networking and Training Opportunities

- These networking forums may also be valuable mechanisms to discuss 'business' aspects of core facility operations.
- With or without specific core facility partnerships, these knowledge sharing and networking approaches will benefit each core facility and open up general communication lines that may lead to future collaboration and partnership opportunities.
- As a related, longer term goal, the three institutions should explore the idea of developing a robust, highly-valued Chicago core research facility director training program.
- This program could:
  - Provide very valuable skills to core facility directors across the Chicago area.
  - Help to facilitate communication and collaboration between Chicago area core facilities.
  - Help to establish and nurture the profession of Core Facility Directors, ultimately strengthening the overall base of this profession in the Chicago area.
  - Perhaps be linked to the emerging MACD organization.
- Core director and administrator training was a session topic at the NIH/NCRR's July 2009 workshop on "The Efficient Management and Utilization of Core Facilities."
- Furthermore, the NCRR "begun steps for addressing many of the concerns raised ... They include plans for … Issuing a Funding Opportunity Announcement to develop course materials for training core directors in the business aspects of core management."

Source: NIH/NCRR Core Facilities Management and Utilization website (http://www.ncrr.nih.gov/core_facilities_management_and_utilization), Accessed March 2010.

Recommendations

IV. Facility Networking and Training Opportunities

IV-2. The three institutions should continue to explore opportunities to use core facilities to facilitate and enable cross-institutional educational and training opportunities.

- These educational and training opportunities, both formal and informal, could serve to:
  - Increase visibility and usage of core facilities among postdocs, graduate students, and faculty
  - Bolster collaboration between similar core facilities in the Chicago area
  - Improve the productivity of core facility users across the Chicago area (e.g., the abilities of graduate students to conduct research projects utilizing core facilities)
  - More strongly link the research and education missions of core research facilities (and the institutional investments made in these facilities)
- Examples may include workshops and formal graduate courses, building off of ongoing activities and discussions at the three institutions:
  - Workshops – Short (e.g., week-long), intense workshops for graduate students, postdocs, and faculty, focused on core facility enabled research techniques and approaches, with both lecture and significant hands-on components.
  - Graduate courses – Short, intense graduate courses that utilize and leverage access to core research facilities.

Next Steps

Next Steps

- Implementation of the recommendations in this report, including additional, more detailed exploration of specific core facility partnership opportunities between the three institutions, is expected to facilitate productive research collaboration.
- As presented in this study's scope of work, possible next steps may include:
  - Obtaining lists of all core facilities at each of the institutions
  - Examining the financial performance of each of the core facilities
  - Identifying possible core facilities to use as initial prototypes for implementation of the proposed models
  - Developing policies and procedures for use of the core facilities included under the partnership models; for example, core research facility:
    - Billing procedures across institutions
    - Access strategies across institutions
    - Governance models across institutions
- Successful implementation of the recommendations contained in this report will be dependent on many diverse factors, including investments in personnel time and cultural changes that enable central and academic units to work as partners to achieve performance objectives.
- Extensive coordination will be required to ensure the implementation efforts meet the needs of the research community.

Next Steps

We suggest that the three institutions consider the following plan for moving forward:

- Obtain consensus to proceed with the implementation of a prioritized list of recommendations contained in this report.
- Develop a project implementation model that will ensure effective coordination among key initiatives.
- Assign a dedicated project manager to oversee the implementation process.
- Develop individual project plans for those areas considered highest priority. Individual project plans should:
  - Describe more specific tasks, responsibilities, timelines, and deliverables
  - Identify necessary resources
- Appoint project teams and begin execution of prioritized project plans.

Appendix

Appendix 1

Interview List

Appendix 1

Interview list

Northwestern University		
Individual		**Unit**
Jim	Baker	Professor, Physiology & Director, Physiology Instrument Shop, Feinberg School of Medicine
Philippe	Baneux	Director, Center for Comparative Medicine
Craig	Bina	Professor, Earth and Planetary Sci. & Assoc. Dean for Research and GS, Weinberg School of Arts and Sci.
Teng-Leong	Chew	Director, Imaging Resources
Rex	Chisholm	Dean for Research, Feinberg School of Medicine
John	Disterhoft	Professor, Physiology & Director, Behavioral Phenotyping Core
Vinayak	Dravid	Professor, Materials Science and Engineering & Director, NUANCE
Elizabeth	Hahn	Director, Outcomes Measurement and Survey Core, FSM
Linda	Hicke	Associate VP for Research
Phil	Hockberger	Director of Core Facilities, Office of Research
Nadereh	Jafari	Director, Genomics Facility
Sheila	Judge	Director, Operations and Outreach, Chemistry for Life Processes Institute (CLPI)
Rich	Lueptow	Professor, Mechanical Engineering & Sr. Assoc. Dean for Academics, McCormick School of Engineering
Tom	O'Halloran	Professor, Chemistry, Biochemistry, Molecular Biology, and Cell Biology & Director, CLPI
Pamela	Reid	Associate Director, Cell Imaging Facility
Jeff	Sundwall	Manager, Instrument Shop, Office for Research
Jay	Walsh	Vice President for Research
Craig	Weiss	Manager, Behavioral Phenotyping Core
Jeff	Weiss	Director, Research Core Planning, Feinberg School of Medicine
Susan	Yount	Research Assistant Professor, Institute for Health Care Studies

Note: Campus interviews at NU, U of C, and UIC (January-February 2010).

Appendix 1

Interview list

University of Chicago		
Individual		**Unit**
Julie	Auger	Executive Director for Shared Research Operations, BSD
Joe	Austin	Technical Director, Electron Microscopy
Graeme	Bell	Director, Diabetes Research and Treatment Center (DRTC)
Jytas	Bindokas	Facility Director, Light Microscopy Core
Susan	Boone	Deputy Director, URA
Rafael	Gama	Technical Director, Functional Genomics Core
Conrad	Gilliam	Dean for Research and Continuing Education, BSD
Ben	Glick	Faculty Director, Light Microscopy Core
Mike	Graziano	Technical Director, Mechanical Technical Core
Geof	Greene	Associate Director, Basic Sciences, UCCCC
Mike	Grosse	Associate Dean for Administration, Physical Sciences Division (PSD)
Lori	Halpern	Budget Analyst, Finance Office, BSD
Larry	Hill	Associate VP for Program Development and National Labs, Office of the VP for Research
Richard	Jordan	Department Chair & Professor, Chemistry
Bob	Josephs	Faculty Director, EM Facility
Antoni	Jurkiewicz	Director, NMR Facility, Department of Chemistry
Vinay	Kumar	Vice Dean, BSD
Christine	Labno	Technical Director, Light Microscopy Core
George	Langan	Director, UC Animal Resources Center
Michelle	LeBeau	Director, UC Comprehensive Cancer Center (UCCCC)

Note: Campus interviews at NU, U of C, and UIC (January-February 2010).

Appendix 1

Interview list

University of Chicago (continued)		
Individual		**Unit**
Mark	Lingen	Faculty Director, Human Tissue Resource Center
Marcy	List	Associate Director for Administration, UCCCC
Leslie	Martin	Technical Director, Human Tissue Resource Center
Carol	McShan	Technical Director, Monoclonal Antibody Facility
Casey	Murray	Executive Director, Sponsored Award Accounting
Mark	Oreglia	Acting Director, Enrico Fermi Institute
Gayle	Orlando	Manager, General Accounting, Financial Services
Mary	Paniagua	Director, Office of Shared Research Facilities, Biological Sciences Division (BSD)
John	Phillips	Physics Sciences Division (PSD)
Jin	Qin	Director, Mass Spec Facility
Jim	Skish	Financial Manager, Office of Shared Research Facilities, BSD
Julian	Solway	Director, Institute for Translational Medicine (CTSA)
Tobin	Sosnick	Faculty Director, Biophysics Core
Anne	Sperling	Associate Professor, Department of Medicine
Jerry	Turner	Professor, Pathology & Assoc. Director, Digestive Diseases Resource Core Center (DDRCC)
Rhonda	Williams	Internal Controls Specialist, Finance Office, BSD
Carol	Zuiches	Director, University Research Administration (URA)

Note: Campus interviews at NU, U of C, and UIC (January-February 2010).

Appendix 1

Interview list

University of Illinois at Chicago		
Individual		**Unit**
Zarema	Arbieva	Director, Research Service Facility - Core Genomics
Annette	Bruno	Director, DNA Services Facility
Pam	Chen	Associate University Counsel
Larry	Danziger	Former Interim Vice Chancellor for Research & Professor, Pharmacy Practice & Exec. Dir., CADRE
Jeff	Fortman	Director, Biologic Resources Laboratory
Roberta	Franks	Director, Research Service Facility - Transgenics Production
Jewell	Graves	Sr. Research Specialist, Flow Cytometry Service
Luke	Hanley	Professor, Chemistry and Bioengineering
Larry	Helseth	Associate Director, Proteomics and Informatics Services
Bill	Hendrickson	Director, Research Resources Center (RRC)
Randal	Jaffe	Professor, Physiology and Biophysics
Michael	Jonen	Visiting Associate Vice Chancellor for Research Administration
Robert	Kleps	Director, NMR Laboratory
Richard	Minshall	Associate Professor, Associate Professor of Anesthesiology and Pharmacology & Academic Dir., Imaging
Alan	Nicholls	Director, Research Service Facility - Electron Microscopy
Marion	Ostrega	Associate Director for Administration, RRC
Eric	Schmidt	Director, Scientific Instrument Shop
Steve	Swanson	Associate Dean for Research and Graduate Studies, Pharmacy & Professor, Pharmacognosy
Debra	Tonetti	Associate Professor, Pharmacology

Note: Campus interviews at NU, U of C, and UIC (January-February 2010).

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