ABRF

- 7 NU Staff/Faculty gave presentations or workshops
- Mentoring
- Funding Models
- Rigor and Reproducibility
  - Committee for Core Rigor and Reproducibility (CCoRRe)

NIH DIVERSITY CONSORTIUM

National Research Mentoring Network (NRMN)

Building Infrastructure Leading to Diversity (BUILD)

Coordination and Evaluation Center (CEC)

Multi-Core Coordination for Omic Studies

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OHSU Research Cores and Shared Resources

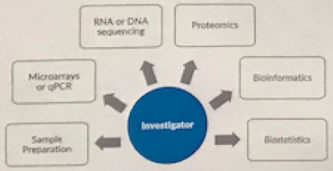
ABSTRACT

The advent of genomic, transcriptomic, proteomic, and other -omic technologies has resulted in large amounts of complex data and the need for sophisticated and well-informed experimental design and analysis strategies. Studies utilizing these technologies require a diverse set of skills and resources that are often accessed through cores. We hypothesized that enhanced communication and planning among cores and with investigators would contribute to better outcomes and, ultimately, to a more efficient overall process. Members of the Multi-core Coordination Committee at Oregon Health & Science University (OHSU) performed a pilot study to test the value of an enhanced core-coordination process. Seven cores providing -omic data generation, study design, and/or data analysis services participated. Pilot projects were selected that involved data generated through an OHSU core and for which design and analysis support were required. Each project was assigned a Core Director Lead for the multi-core coordination process who was responsible for monitoring project development and progress and guiding cross-core and researcher communications. An administrative coordinator provided support for communications, meeting organization, and tracking of action items and core deliverables. The Evaluation Core of the Oregon Clinical and Translational Research Institute was contracted to perform an independent evaluation of the pilot.

Communication, progress, and challenges varied with the individual projects. Principle Investigator experience with the multi-core coordination trial was generally positive as reflected in Evaluation Report and communications with individual core directors; benefits included increased access to members of the multi-disciplinary team during design, QC, and analysis phases of project. Most core directors found the tested multi-core coordination model of benefit in providing guidance to investigators, improving communication with other cores, and bringing new insight to the data QC and analysis process. However, core directors also reported issues with the amount of core staff time spent in meetings, scope creep, and moving projects from design to data generation.

BACKGROUND

University investigators have access to technology and analysis cores that provide the services below for omics studies. Many studies require the use of more than one core, and for complex studies may require the work of several cores. A lack of coordination and alignment across cores can slow progress and create frustrations for investigators and cores. Seven core directors at OHSU came together to discuss ways to improve core-to-core communications and investigator guidance and support. A pilot study to implement and evaluate a multi-core coordination process was proposed. With financial support from the University, the pilot was launched in February, 2017.



Challenges to efficient & successful experiments utilizing omic platforms:

- Steep knowledge curve for researchers new to the platforms
- Researcher needing to navigate across multiple cores
- Study designs that are suboptimal for research goals
- Data left in limbo after generation
- Inadequate data QC - absence of comprehensive and coordinated review by both technical and analytical experts
- Analysis goals/plans developed after data generation
- Need for data integration across omic platforms
- Ensuring that core staff are seen as available & skilled collaborators

PILOT STUDY DESIGN

6 month trial (Phase 1) to implement and pilot a multi-core coordination process engaging cores involved in study design, data generation, and data analysis for omics projects

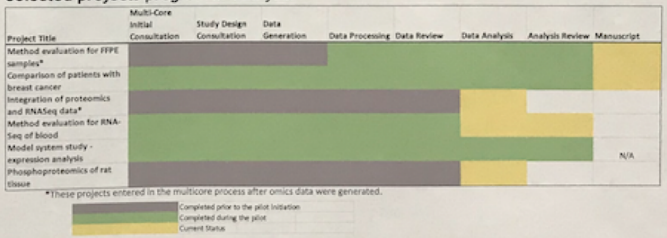
- Ensure communication among cores & researchers prior to design finalization and throughout data generation QC process
- Run 5-10 omics projects through the multi-core coordination process
- Assign admin coordinator to set up meetings, facilitate communication, track action items and deliverables
- Contract with OCTRI Evaluation Core for independent evaluation of pilot process and outcomes, and investigator and core director experience

	Multi-Core Initial Consultation	Study Design Consultation	Data Generation	Data Processing	Data Review	Data Analysis	Analysis Review	Manuscript
Sample Prep & Data Generation								
Bioinformatics								
Biostatistics								
Multi-Core Coordination								

Multicore process
Coordination Effort
Part of Core Business

RESULTS

Selected projects progress at one year



Evaluation Core Report (Interviews with PIs & Core Directors)

POSITIVE	NEGATIVE
• Collective responsibility to meet the project goal • Better project planning and coordination • Better study design and analytical methods • Increased consistency in communication • Increased efficiency by reducing duplicative work • Risk mitigation of staffing changes in individual cores	• Challenge of managing increased level of communication • Demand for in-person meetings • Need for more project management support from someone with scientific expertise

Core Director Feedback

POSITIVE	NEGATIVE
• Better communication • Awareness of the overall project status • More efficient hand-off • Knowledge sharing • Better understanding of data • Early identification of potential problems • Identification of projects that benefit from multicore coordination • Increased engagement • Collective responsibility for design and timelines	• Increased time commitments for core leadership and staff • Scope creep • Time spent on experimental designs can result in project delays and unrealistic expectations for data generation cores

CONCLUSIONS

Lessons learned:

1. Face-to-face meetings among researchers and multiple cores is valuable for providing clarity on research goals, educating all participants on technical and analytical details, and development of appropriate study designs. However, the demand on core staff time for these meetings is very difficult to sustain.
2. Genomic data generated without explicit planning around analysis strategy and data integration among omic data types is very difficult to work with even with addition of multi-core coordination.
3. Important to have all parties in agreement on goals and responsibilities early in process
4. In some cases, more "cooks in the kitchen" can lead to over-ambitious experimental designs and prolonged planning, resulting in delays in data generation and extended analysis times.

Benefits:

1. PI does not have to know which core does what as multicore process provided comprehensive support for entire project.
2. Potential for seamless budgeting and workflow coordination.
3. Increased knowledge across cores and PI research teams about various core functions and activities.
4. Data generated with appropriate design reduces risk of problematic data that bogs down at data analysis phase.

NEXT STEPS

- Continue as multi-core group and build on pilot results
- Develop and evaluate more scalable multi-core coordination process, i.e., fewer meetings, more streamlined core-to-core workflows and hand-offs
- Implement work plan agreement before initiation of core work
- Develop criteria for identifying new projects that will most benefit from multi-core coordination process
- Identify financially sustainable model for covering core staff time involved in multi-core coordination
- Explore development of online resources that will inform and guide researchers through use of cores for omics studies