ABRF Core Rigor, Reproducibility and Transparency Survey

In 2015, the NIH published a notice on Enhancing Reproducibility through Rigor and Transparency (NOT-OD-15-103) identifying 4 areas that have been largely overlooked and now required to be addressed in grant applications. These 4 areas are: 1) Scientific premise forming the basis of the proposed research, 2) Rigorous experimental design for robust and unbiased results, 3) Consideration of relevant biological variables, and 4) Authentication of key biological and/or chemical resources. Subsequent guide notices have been published by NIH outlining updated instructions for applications, including: an overview (NOT-OD-16-004); NIH & AHRQ Research Grant Applications (NOT-OD-16-011); NIH & AHRQ Career Development Award Applications (NOT-OD-16-012); and institutional training, institutional career development, and individual fellowship applications (NOT-OD-16-034).

The Association of Biomolecular Resource Facilities (ABRF) Committee on Core Rigor and Reproducibility (CCoRRe) conducted a survey in 2017 to learn how scientific cores or other shared resource facilities generate transparent, rigorous and reproducible research data. The results of this survey were published in the ABRF Journal of Biomolecular Techniques in 2019 (Knudtson et al. Survey on Scientific Shared Resource Rigor and Reproducibility. J Biomol Tech. 2019;30(3):36–44.). CCoRRe is now conducting a follow up survey to assess how (or if) awareness and implementation of guidelines, policies, and best practices for rigor, reproducibility and transparency have shifted in the ensuing four years.

Thank you for taking this 10 minute survey (17 multiple choice questions). All responses will be anonymized.

1 Which of the following best describes your position? Select all that apply.

- ☐ Student, Post-doctoral fellow, or Trainee
- ☐ Technical Support Staff
- ☐ Core Director or Manager
- ☐ Research Scientist
- ☐ Clinical Staff
- ☐ Faculty Member / Principal Investigator
- ☐ Core Administrator
- ☐ Institutional Administrator
- ☐ Other

Please describe your position. _____

2 Which of the following best describes your organization or institution?

- ◯ Academic
- ◯ Hospital
- ◯ Industry
- ◯ Government
- ◯ Non-profit Research Institute
- ◯ Foundation
- ◯ Other

Please describe your organization. _____

3 Are you an ABRF member?

- ◯ Yes
- ◯ No

4 What type of core(s) do you work in, or what type of core services do you provide? Select all that apply.

- ☐ Animal
- ☐ Animal Imaging
- ☐ Antibody Development
- ☐ Behavioral
- ☐ Bioinformatics
- ☐ Biostatistics
- ☐ Biorepository
- ☐ Cell Culture
- ☐ Chemistry
- ☐ Clinical Trial
- ☐ Clinical Pharmacology
- ☐ Cryo Electron Microscopy
- ☐ Electron Microscopy
- ☐ Epigenomics
- ☐ Flow Cytometry
- ☐ Gene Therapy
- ☐ Genetics
- ☐ Gene Expression
- ☐ Genomics
- ☐ Genome Editing
- ☐ Health Assessment
- ☐ High Throughput Screening
- ☐ Histology
- ☐ Imaging
- ☐ Immune Monitoring
- ☐ Light Microscopy
- ☐ Metabolomics
- ☐ Microbiome
- ☐ NMR
- ☐ Pathology
- ☐ Protein Production
- ☐ Proteomics
- ☐ Shared Instrumentation
- ☐ Stem Cell
- ☐ Tissue Procurement
- ☐ Transgenics
- ☐ X-Ray Crystallography
- ☐ Other

Please describe other types of core services you provide or enable. _____

5 Are you aware of any guidelines or requirements instituted by your government, private funding agencies or major publishers to address research reproducibility concerns?

- ◯ I am very familiar with them
- ◯ I have heard of them but have not given them much thought
- ◯ I am not aware of them

6 What factors do you think most contribute to the inadequate level of rigor and reproducibility in science? Select all that apply.

- ☐ Time
- ☐ Cost / Money
- ☐ Inadequate training, mentorship, oversight
- ☐ Inadequate understanding of technologies
- ☐ Poor experimental design (insufficient replicates, sample size, experimental and technical controls)
- ☐ Inadequate documentation of experiments, data management
- ☐ Inadequate standardization of protocols, guidelines, data analysis
- ☐ Inappropriate experimental, analytical tools
- ☐ Inadequate peer review
- ☐ Irresponsible research conduct

Please comment on other factors you think contribute to the inadequate level of rigor and reproducibility in science.

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7 What is the greatest challenge in providing reproducible results from your group?

- ◯ Inadequate training of users
- ◯ Underutilization of core expertise to design experiments
- ◯ Not following the core's advice
- ◯ Insufficient amount of biological material
- ◯ Inadequate instrument maintenance
- ◯ Poor sample quality from users, sample variability

Please comment on other challenges to providing reproducible results from your group.

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8 What procedures do you have in place to support reproducible research? Select all that apply.

- ☐ QC procedures
- ☐ Electronic notebooks
- ☐ SOPs
- ☐ Equipment management plans
- ☐ Reagent inventory procedures
- ☐ Data management and archive procedures
- ☐ Standardized double checking practices
- ☐ Technical support and/or Consulting
- ☐ Educational opportunities, Training
- ☐ Other

Please describe other procedures you have in place to support reproducible research.

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9 What additional procedures or activities would you like to implement to improve research reliability? Select all that apply.

- ☐ Mandatory consultation between the core and investigator prior to rendering services
- ☐ Integration of standardized procedures for management of data, equipment, personnel, reagent, specimen, supplies, methods and environment
- ☐ Routine risk assessments
- ☐ Stringent method validation and documentation
- ☐ Use of electronic lab notebooks and/or laboratory management software
- ☐ Industry-vetted best practice guidelines for core technology
- ☐ Other

Please describe additional procedures or activities would you like to implement to improve research reliability.

_____

10 What barriers do you encounter when you consider implementing these additional activities?

- ☐ Time constraints
- ☐ Core lacks proper guidelines and training
- ☐ Too costly
- ☐ Lack of buy-In from core staff (feeling powerless)
- ☐ Lack of customer buy-In
- ☐ Fear of losing customers
- ☐ No barrier
- ☐ Unsure

11 How could barriers to improving research reliability be eliminated or at least mitigated?

- ☐ Improve core resources (funding, workforce)
- ☐ Improve education, training and investigator-core collaboration to ensure best practices
- ☐ Implement mandates or incentives by funders, publisher, institutions, other stakeholder for best practices
- ☐ Use Standardized Procedures, SOPs/QC/tools
- ☐ Champion culture change to empower core leadership to ensure best practices are implemented
- ☐ Unsure

12 Does your group have a document or statement addressing research rigor or reproducibility for the services it provides?

- ◯ Yes
- ◯ No

13 Have you received requests for a rigor and reproducibility statement for your services?

- ◯ No
- ◯ Yes to support publications
- ◯ Yes to support grant applications
- ◯ Yes other reason

Please describe other reasons you were asked for a statement pertaining to rigor and reproducibility.

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14 Has your institution asked your group to participate in any way in promoting rigor and reproducibility for the investigators?

- ◯ Yes
- ◯ No

Please describe the ways you or your group have participated in promoting rigor and reproducibility.

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15. How could ABRF best support your efforts to improve rigor and reproducibility within your own core lab? Please rank these potential offerings in importance

	Most important	Important	Somewhat important	Neutral	Unimportant
online tools and resources	○	○	○	○	○
Webinars on rigor and reproducibility	○	○	○	○	○
Specific content at the annual ABRF meeting focused on rigor and reproducibility	○	○	○	○	○
Workshops on rigor and reproducibility (online or throughout the year at regional sites) to promote the adoption of best practices	○	○	○	○	○
Mentoring opportunities	○	○	○	○	○

16 Was your lab ready for this pandemic? What have you done differently to foster core responsiveness, rigor and reproducibility during this critical public health threat?
Check any that apply:

- ☐ Increase cross training in core laboratories
- ☐ Participate in laboratory preparedness drills to support rapid internal/external mobilization activities.
- ☐ Establish or improve strategies for maintaining reliable supply chain for critical reagents
- ☐ Improve documentation strategies to ensure efficient collaboration, method & data transfer/sharing
- ☐ Improve communication, collaboration across core laboratory network to improve efficiency, rigor, and responsiveness
- ☐ Develop standardized procedures for rapid mobilization of core laboratories to meet specific and novel testing requirements.
- ☐ Other

Please describe other actions you have taken to foster core responsiveness, rigor and reproducibility during this critical public health threat.

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17 Is your lab ready for the NEXT pandemic? What would you like to do differently to foster core responsiveness, rigor and reproducibility to meet the next critical public health threat? Check any that apply:

- ☐ Increase cross training in core laboratories
- ☐ Participate in laboratory preparedness drills to support rapid internal/external mobilization activities.
- ☐ Establish or improve strategies for maintaining reliable supply chain for critical reagents
- ☐ Improve documentation strategies to ensure efficient collaboration, method & data transfer/sharing
- ☐ Improve communication, collaboration across core laboratory network to improve efficiency, rigor, and responsiveness
- ☐ Develop standardized procedures for rapid mobilization of core laboratories to meet specific and novel testing requirements.
- ☐ Other

Please comment on what you would like to do differently to foster core responsiveness, rigor and reproducibility to meet the next critical public health threat.

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