



Scientific Integrity Principles and Best Practices

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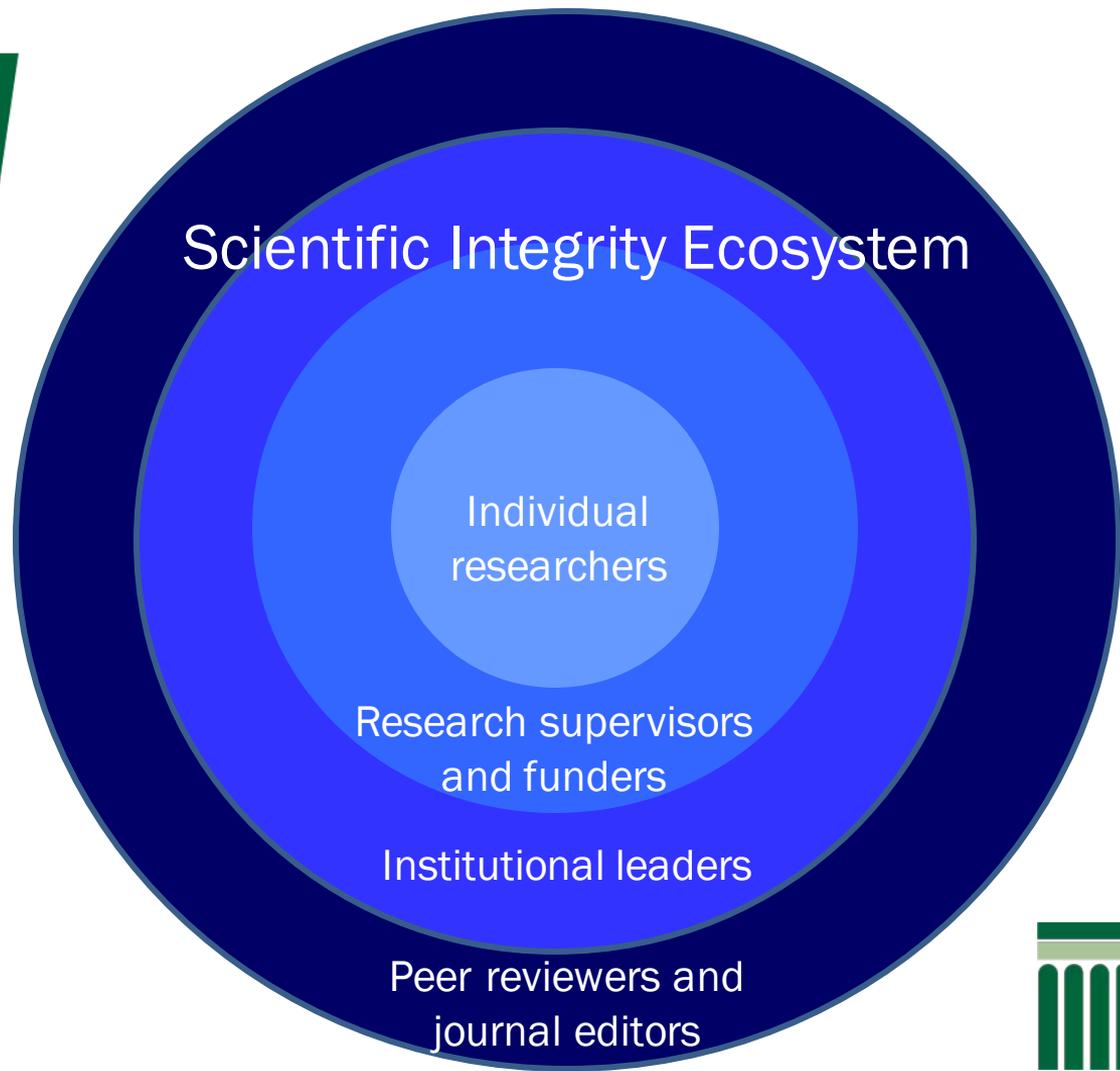
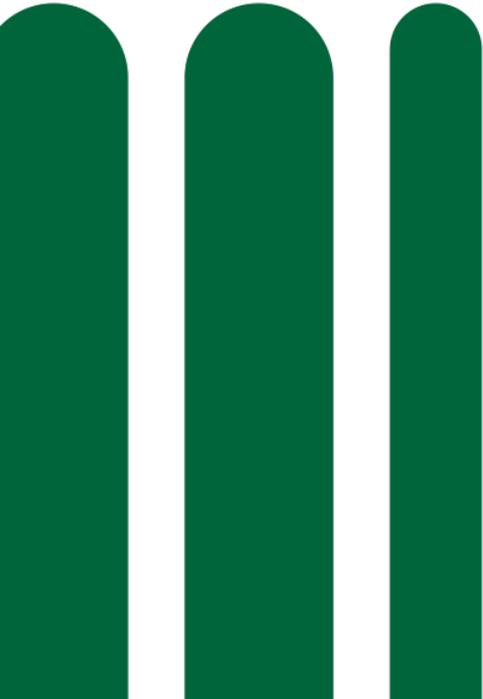
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Definitions

- **Scientific Integrity**
 - “When persons...adhere to accepted standards, professional values, and practices of the relevant scientific community”
- **Research Misconduct/Breach**
 - “Fabrication, falsification, plagiarism in proposing, performing or reviewing research; or in reporting research results”
- **Detrimental Research Practices**
 - “When researchers commit research misconduct or engage in other behavior that clearly damages research and stray from the norms and appropriate practices of science”
 - “Questionable research practices” is used in Canada and abroad





Scientific Integrity is Complex

- 21st Century scientists work in a research environment “that is being transformed by globalization, interdisciplinary research projects, team science, and information technologies”
- Progress has been made, but there is more work to be done





Scientific Integrity Consortium

- Convened by ILSI North America and hosted by the Government-University-Industry Research Roundtable (GUIRR) at NASEM



Scientific Integrity Consortium

- The Consortium
 - Articulated key principles relevant to current and emerging contexts
 - Identified key gaps/failures in realization of the principles
 - Suggested concrete steps for addressing the gaps/failures



Recommended Principles

- Overarching principles for fostering scientific integrity:
 1. Foster a culture of integrity in the scientific process
 2. Evidence-based policy interests may have legitimate roles to play in influencing aspects of the research process, but those roles should not interfere with scientific integrity



Recommended Principles

- *Foster a culture of integrity in the scientific process*
 - Must be fostered by all facets of the scientific community
 - Institutions must:
 - Develop policies, procedures, and practices that address scientific integrity
 - Provide training of personnel
 - Work continuously to maintain awareness and advocacy for these practices



Recommended Principles

- *Evidence-based policy interests may have legitimate roles to play in influencing aspects of the research process, but those roles should not interfere with scientific integrity*
 - This principle addresses the interface of science and policy
 - The ultimate use of science in policy – as well as decision-making and public opinion – should not affect the content of the science

Best Practices

- Experimental Design
- Statistical Analysis
- Responsible Research Practices
- Promote Research Quality

Require Universal Training in Scientific Methods

- Strengthen Institutional Capacity for Dealing with Research Breaches
- *Research Integrity Advisory Board*

Strengthen Scientific Integrity Oversight & Ethics Training

- Move to Open Science Framework
- Full and Transparent Reporting of Methods, Statistics, Results, etc.

Encourage Reproducibility through Transparency

Best Practices

- Move to Sharing all Data
- Tri-Agency Open Access Policy
- Considerations?
- IP issues?

Establish Open Science as the Norm

- Train Scientists to Accurately Communicate Research
- Ensure Approval of Press Releases

Develop Tools to Teach Communication Skills that Uphold Scientific Integrity

- Conflict of Interest Disclosures
- Use of Robust Checklists
- Increase Recognition of Review Activities

Strengthen the Peer Review Process

Best Practices

- Remove Publication Bias
- Change Terminology: Unanticipated vs. Negative

Encourage Publication of Unanticipated Findings

- Standardize Language and Processes Related to Retractions & Corrections

Seek Harmonization for Retraction or Correction of Papers

- Development of New Metrics to Recognize Research Quality

Design Criteria to Recognize High Standards of Scientific Integrity



Going Forward: Checklist & Metrics

- Checklist
 - One checklist to serve many purposes
 - Could serve as a guide to the design, conduct, and reporting of studies and as an objective tool for the evaluation of published research
 - Criteria for a “stamp of approval” which could be used to maintain the trust of the scientific community and public in study results
- Metrics to measure scientific integrity



Going Forward: Next Steps

- Campaign to share Principles and Best Practices
- Email the Consortium with your ideas of how to implement the Principles and Best Practices: comments@scienceintconsortium.com
- The Consortium will explore the development of the recommendations for a checklist and the development of metrics, potentially in collaboration with other organizations



Going Forward: Next Steps

- Emory University and Public Responsibility in Medicine (PRIM&R) Responsible Conduct of Research Instruction Workshop
 - September 19-20, 2018 in Atlanta, Georgia
- Ohio State Research Integrity Summit
 - *Seeking Solutions in Research Integrity: A View from All Perspectives*
 - September 23, 2018 in Columbus, Ohio