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 Ecosystem

- Individual researchers
- Research supervisors and funders
- Institutional leaders
- Peer reviewers and journal editors
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

- Standardize Language and Processes Related to Retractions & Corrections

- Development of New Metrics to Recognize Research Quality

Encourage Publication of Unanticipated Findings

Seek Harmonization for Retraction or Correction of Papers

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