

Summer Research Programs

Ethical & Responsible Conduct of
Research

Data Management

Joe Giffels

Director, Research Integrity Office

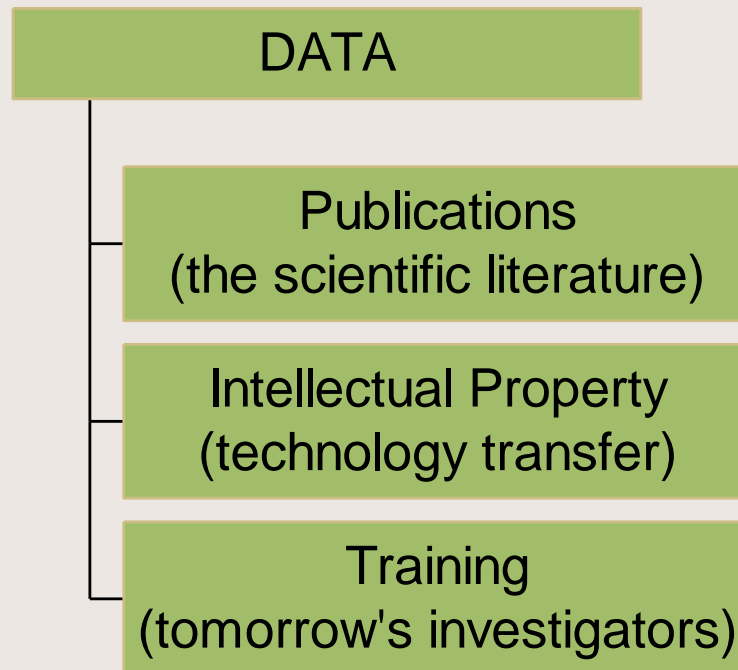
University of Maryland Baltimore

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Responsible Conduct of Research

- Data acquisition, management, sharing, and ownership
- Mentor/trainee relationships
- Publication practices and responsible authorship
- Peer review
- Collaborative science
- Human subjects
- Research involving animals
- Research misconduct
- Conflict of interest and commitment

Research Generates...



Research

Research means a systematic investigation, including research development, testing and evaluation, designed to develop or contribute to generalizable knowledge

Investigator

An *Investigator* is anyone involved in designing, conducting or reporting research

Laboratory

The *laboratory* is anywhere research is conducted

Data

Data are observations collected or generated during the conduct of research

Data Formats (examples)

- Written observations, journals
- Computer print-outs
- E-files (wherever and however they are stored)
- Audiotapes or files, CDs
- Transcriptions
- Gels
- Photographs or digital images
- Quantitative representation of scanned data
- Video files, DVDs
- Specimens

Data Issues

- Ownership
- Access
- Confidentiality

Why Keep a Research Notebook?

- Good scientific practice
- Satisfy regulations
- Aid in documenting results
- Establish, protect credit for intellectual property development
- Respond to allegations of scientific misconduct

Notebook Entries

from Department of Chemistry, University of Kentucky

<http://www.chem.uky.edu/courses/common/notebook.html#GuidelinesInclude>

- Make direct entries, in blue or black ink
- Bound; consecutive, numbered pages, with TOC on first few pages
- Each experiment begins on new page
- Every page: Your Name, Date, Title of Experiment
- Include and explain sketches, diagrams, etc
- Photos, drawings, etc., should be identified and permanently attached
- Don't erase or obliterate mistaken entries; cross out and enter changes legibly, noting reason
- Periodically have someone look over entries and witness same by applying signature and date

Notebook Entries

from Department of Chemistry, University of Kentucky

<http://www.chem.uky.edu/courses/common/notebook.html#GuidelinesInclude>

- Another scientist should be able to understand and interpret your notebook without assistance
- Each Experiment should include: Primary Reference, Purpose, Calculations, All Observations and Measurements, Sources of Materials and Instruments, All Data Collected, Conclusions

Examples of Ethical Concerns in Data Management

- Replicability of results
- Analysis of data sets
- Data sharing / public use data sets

Data Sharing

- NIH Data Sharing Policy

http://grants.nih.gov/grants/policy/data_sharing/

Examples of Ethical Concerns in Data Management

- Replicability of results
- Analysis of data sets
- Data sharing / public use data sets
- Fabricated, falsified, plagiarized (ie, stolen) data
- Stewardship of data
- Ownership of data
- Social or political unacceptability