

Scientific Writing: Ethics in Writing & Publishing

John Leslie, Professor & Head
Department of Plant Pathology
Kansas State University
Manhattan, Kansas USA

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Reference Books

- ❑ Shamoo, A. E. & D. B. Resnik. 2009. *Responsible Conduct of Research*, 2nd ed. Oxford University Press, New York.

 - ❑ Macrina, F. L., ed. 2005. *Scientific Integrity*, 3rd ed. ASM Press, Washington, D.C.
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What Is Ethics?

- ❑ Objectivity alone isn't enough
 - ❑ What might make you feel uncomfortable as you make a difficult decision
 - ❑ Standards of conduct that distinguish right from wrong, good from bad, etc.
 - ❑ An academic discipline that studies standards of conduct
 - ❑ An approach to decision making
 - ❑ A state of character
 - ❑ A branch of (moral) philosophy
 - ❑ Research is no longer considered beyond scrutiny and above reproach – too many \$\$\$\$
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Ethics

- ❑ Are not laws, which must be followed; ethics – should be followed
 - ❑ May be legal, but unethical
 - ❑ Usually more than a minimum, often a goal
 - ❑ Legal and ethical obligations may not be the same
 - ❑ Are not religion, but religious beliefs may influence values
 - ❑ Scientists as professionals have a greater responsibility not to harm public safety & welfare
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Four Moral Principles

- ❑ In some cases these conflict!
 - 1. Do not inflict unjustified harm
 - 2. Promote one's own well-being and benefit others
 - 3. Allow rational individuals to make their own decisions and act on them
 - 4. Promote "justice"
 - ❑ An ethical decision occurs when there are at least two options and the options are not ethically equivalent
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Steps in Making an Ethical Decision

1. State or define the problem
 2. Gather relevant information
 3. Delineate or construct different options
 4. Relate the various options to the values or principles that are at stake
 5. Evaluate options in context of values, principles and relevant facts
 6. Make decision and act
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Some Advice on the Process

- Talk it over with other people
 - Make sure all the options are identified and the information is complete
 - Discard irrelevancies and impossibilities
 - Maintain integrity
 - Realize that decisions may transcend a particular situation
 - There may not be a "right" answer, but there usually are some "wrong" ones
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Ethical Research Principle Details I

- Honesty
 - Accurate reports and protocols
 - Identified conflicts of interest
 - No falsification or misrepresentation of data
 - Objectivity
 - Not limited to experimental design
 - Consciously look for bias
 - Integrity and consistency
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Ethical Research Principle Details II

- Carefulness
 - Timely & orderly records of research and correspondence
 - Openness
 - Share information, tools & protocols
 - Accept criticism & new ideas
 - Respect Colleagues
 - Respect Intellectual Property
 - Do not use unpublished data
 - Give credit where credit is due
 - Promote freedom of thought and inquiry
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Ethical Research Principle Details III

- Promote social good & minimize social harm
 - Use resources (people & things) efficiently
 - Educate and mentor more junior colleagues wherever possible
 - Maintain your own competence and skills
 - Avoid discrimination for reasons other than quality
 - Obey the relevant laws
 - Exploit neither humans nor animals in your studies
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It's All About You

- Data collection and analysis
 - Data management and record keeping
 - Intellectual property
 - Usually individual efforts with little interaction with others
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Good Research Practice

- Good quality control practices
 - Published data are verifiable – there is a paper trail documenting the origin of the data and its subsequent manipulation
 - Published data are reproducible by others who follow the published procedures
 - Conclusions drawn from the research are consistent with the data
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The Laboratory Notebook

- Bound, numbered pages
 - Basis for papers, reports and grants
 - May be audited by granting agencies
 - May be reviewed by patent offices and journals
 - Contains "intangible" data – observations, calculations & interpretations
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Explain in your lab notebook

- What you did
 - Why it was done
 - When it was done
 - What/where materials were/are
 - The results obtained
 - How results were interpreted
 - Who helped
 - What comes next
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Characteristics of a Good Lab Notebook

- Legible
 - Well-organized & easy to follow
 - Accurate
 - Complete
 - Understandable by others
 - Consistent with grant agency requirements
 - Stored or backed up
 - Accessible to all authorized persons
 - Has a useable Table of Contents
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Data Ownership and Retention

- Almost always owned by the institution not the individual
 - Investigators are stewards
 - Data storage is responsibility of the P.I.
 - Usually must be maintained for 3 years; 7 is recommended, but longer is not an uncommon practice
 - If published, original data may be subject to FOI Act requests
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Copyright

- Requires originality ≠ novelty
 - Decide who may make copies or derivatives, perform or display it, distribute, sell or rent copies of it
 - Lasts for lifetime of author(s) + 70 years
 - Ideas are not copyrightable
 - Usually owned equally by all authors, not their institutions (if academics)
 - "Work for hire" rules in industry – assigned to do a particular thing
 - "Fair use" determines if copies can be made without paying royalties
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You and Your Friends

- Collaboration is essential for most modern science
 - Others in the working group
 - Peers
 - Mentors/mentees
 - Collaborators at other places
 - Things commonly shared
 - Authorship or other credit for what was done
 - Tools, reagents and equipment
 - Ideas about what to do next
 - Requires trust, fairness, accountability and collegiality
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Three Fundamentals to Start With

- Collegiality
 - Sets the atmosphere for all the rest
 - Respect for colleagues at all levels in the group
 - Friends/allies in pursuit of a common goal
 - Must avoid harassment, verbal abuse, discrimination, jealousy, theft and personal grudges
- Fairness
 - Everyone receives a proportionate share of the rewards
 - Unpleasant tasks are distributed equitably
 - Avoid plagiarism, gift authorship and "pecking orders"
- Accountability
 - Who is doing what – distribution of responsibility
 - Often requires a named leader
 - Requires clear communication and supervision

Research Collaboration: Points to Consider

- Complexity increases exponentially as the number of partners increases
- Responsibility – Who is involved and what will they do?
- Authorship – Who and where on the list? Who will do the writing and submitting?
- Extent of collaboration – Time? Effort? Money?
- Intellectual property – Who files? Assignments? Who pays?
- Funding – Source(s)? Who will write grants? Who pays for which expenses?
- Conflicts of interest – Are there any?
- Resource sharing – Access to data, reagents & living materials
- Dissemination of results – Where to publish? General public access?
- Deadlines – Are there any?
- Regulations (legal or institutional) – Are there any?

Rules for Successful Collaborations

- Set it up in advance!!!
- Communication is everything
- Set specific goals
- Keep finances open and straight
- Understand how it will end and the responsibilities that will continue
- Every collaborative effort is unique
- Make sure junior colleagues don't lose

Reasons to Share Resources

- Working on same project in same research group
- Increases speed and efficiency of the research process
- Different approaches can yield new insights
- Promotes objectivity, repetition and constructive criticism
- May help attract new resources
- Encourages collegiality, trust and openness
- Promotes fairness and equity
- Required by law or institutional regulation

Reasons NOT to Share Resources

- Ideas/results are incomplete or could not withstand anticipated critiques
- Protecting claims for discovery, priority and intellectual property
- Protect institutional or local investments
- Protecting confidential information on:
 - Personnel or student records
 - Human subjects
 - Military or privately funded research
 - Forensic investigations

Material Transfer Agreements

- Limits & conditions on uses to be made of material
- Limits on redistribution of material
- Limitations to publication
- Acknowledgement of the source
- Warranties concerning the material
- "Hold harmless" clause
- Conditions for return/disposal of unused material
- Fees or financial conditions
- Legally authorized signature

Authorship

- Publications are scientific currency
 - Number of authors on paper may number in tens or hundreds, average is 5+ for medical research
 - LPUs – Least Publishable Units
 - Increases “credit”, but makes science harder to follow
 - Authorship requires a contribution
 - Authorship is accompanied by responsibility and accountability
 - Some journals now require a statement of who made which contributions
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Problem Authorships

- Gift Authors
 - A personal or professional favor; sometimes reciprocal
 - Honorary Authors
 - Sign of respect or gratitude
 - Sometimes an institutional requirement
 - Prestige Authors
 - Someone well known to give paper more visibility or impact
 - Ghost Authors
 - May help with writing, but no participation in planning, execution or analysis
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Denied Authorships

- Who has priority?
 - Who owns rights to intellectual property?
 - Keeping the number of authors “down to a reasonable number”
 - Biggest problems
 - Plagiarism – representing the work of others as your own
 - Self-plagiarism – reuse of your own work without acknowledgement
 - Citation amnesia – misrepresents what has been done before by others
 - Intellectual theft – no authorship or acknowledgment for a contribution made
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Guidelines for Authorship

- Read the journal’s “Instructions to Authors”
 - All authors are accountable for the entire paper
 - Author order often implies significance of contributions, but must be mutually agreeable to all involved
 - Students are usually first author for work from their thesis
 - Acknowledgments if a contribution, but not large enough to be an author
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You and the Rest of the World

- Publications
 - You tell the rest of the world what you have done and why it is important
 - Peer Review
 - The rest of the world looks at you and your work for evaluation purposes
 - Conflicts of Interest
 - When there is perhaps more than a scientific reason for reaching the conclusions you reached
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Managing Conflicts of Interest

- Most universities require a disclosure of real or perceived conflicts of interest
 - Guidelines often apply to close family as well
 - Leadership positions in companies or institutes
 - Equity > 5% or > \$10,000 in a company
 - Consultancies paying > \$10,000 per year
 - “Excessive” gifts or honoraria
 - Employment by another entity
 - Time commitments of more than a single day to a single entity
 - Management plans and/or avoidance may be required to remedy problems
 - Some journals may require these for publications and some granting agencies before an award is made
 - May be internal rules or laws (state and/or federal) that govern the disclosure – timing and content
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Discussion sessions

- Each small group has three cases
 - Answer any questions associated with the case
 - Make sure all members of the group express an opinion
 - Be prepared to discuss findings with all at the end of the small group session
 - Group assignments:
 - Bender – 1, 5 & 7 Baker – 5, 8 & 9
 - Leslie – 2, 4 & 9 Blanke – 3, 4 & 7
 - Montgomery – 1, 6 & 8
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