

# ***Biological Scientific Writing (BIOL 825)***

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## **Lecture Notes — *Writing Thesis and Funding Proposals***

Follows the text by A. J. Friedland and C. L. Folt (2009):

*Writing Successful Science Proposals, second edition*

Yale University Press, New Haven, Connecticut

### Types of proposals

- Unsolicited proposals.
  - Choice of research question dictates appropriate funding sources.
  - Choice of research question also dictates which journals might publish any manuscripts derived from your thesis.
    - The best research questions add to our broader knowledge of the subject area rather than confirm existing knowledge.
    - Avoid “me too” projects.
    - For example, largemouth bass populations were studied previously in 2 of 3 reservoirs in a specified area. Repeating the study in the third reservoir in the absence of any novel attributes of the system is unlikely to add to the existing knowledge. Documenting the condition of the largemouth bass population to apply appropriate management practices will limit your publication options.

*“Darwin’s mental development on the voyage [of the Beagle] should consequently be given its due. Any number of young men attended Grant’s or Jameson’s or Sedgwick’s lectures, any number of enthusiasts collected natural history specimens. Few of them asked the kind of questions Darwin came to ask.”*

Janet Browne. 2006. *Darwin’s Origin of Species: A Biography*. Atlantic Monthly Press, New York.

- Program-initiated proposals.
  - Additional, perhaps more desirable, research project could be added to requested project.

### Authorship and Ownership

- Who is to be an author of the proposal and any reports or publications should be made clear at the outset.
  - Authors include people essential to designing the project, analyzing data, and writing publications.
    - Paid support personnel and committee members (other than advisor) typically are not included as authors.
    - People who assist with the project and funding sources are included in acknowledgments.
  - Thesis proposal has the graduate student as the sole author.
  - Funding proposals for support of thesis research typically include the graduate student, advisor, and perhaps others as dictated by the circumstances.

- The role of each author also should be made clear at the beginning.
  - Role in research.
  - Role in preparing and revising the proposal.
  - Role in preparing and revising reports or publications.
  - What about someone who offers informal advice?
- Discuss funding sources and publication strategies at the beginning of the process.
  - Pursue an FHSU student research grant and student meeting travel grant (early deadlines each semester; receipts required).
- Ownership of the data, equipment, and supplies obtained during project usually is retained by the university or funding agency.

#### Organization of a proposal [also see FHSU Graduate School protocols]

- Follow any format guidelines mandated by the funding agency.
- Program-initiated proposals might require as little as a dollar amount or some subset of the items typically included in an unsolicited proposal.
- Four precepts for organizing a proposal:
  - organize your information well,
  - highlight your most important points early in the proposal,
  - funnel the reviewer from the general background to the specific aspects of your proposed research,
  - focus on your specific research and avoid burying it in unnecessary information.
- Possible sections of a grant proposal:
  - I. Title (see Friedland and Folt, 2009:49-58).
  - II. Abstract (project summary).
  - III. Project description.
    - A. Statement of the question and its significance, and a literature review.
      1. Funnel the reader (reviewer) by starting with a broad perspective of the topic; give them an idea of the relationship of your research in a broader area of scientific research.
      2. Show a relationship to earlier research (your research or that conducted by others), if applicable.
      3. Emphasize how your research adds to the broader knowledge rather than being a “me, too” project.
      4. Summarize preliminary data (if any).
      5. Use key literature that is supportive of your proposal, but include any contrary literature.
        - A thorough summary of relevant previous research demonstrates the depth of your knowledge of the subject.
      6. Continue the “funnel” by clearly stating your objectives and hypotheses (they are not the same; see examples in Friedland and Folt, 2009:78-85).
        - After funneling the reader through the current state of knowledge and gaps in that knowledge, it should be clear to them how your study will help answer some of the remaining questions.

- B. Summarize methods and analyses you plan to use, as well as justifications for their use, as necessary (see Friedland and Folt, 2009:106-121).
    - 1. Use future tense for methods in a proposal, not past tense, as you will in your thesis or manuscript.
  - C. Summarize possible results (expected and unexpected); remember to keep an open mind about possible results that might not be what you expected (see Friedland and Folt, 2009:124-128).
  - D. Timetable (be realistic with the funding agency and yourself); be as specific as possible (see Friedland and Folt, 2009:129-133).
  - E. Literature Cited (see Friedland and Folt, 2009:134-140).
    - 1. Be certain you cite the references accurately.
    - 2. Do not include a reference you have not read (references are sometimes cited incompletely or incorrectly by others).
    - 3. Place citations within sentences where they belong, not necessarily at the end of a sentence.
  - IV. Qualifications of investigators (perhaps curriculum vitae of authors of proposal).
  - V. Sources of support and facilities already available or being pursued.
  - VI. Budget (see Friedland and Folt, 2009:141-149).
    - A. Salaries (for you and for assistants).
    - B. Equipment (usable after project completed).
    - C. Supplies (expendables).
    - D. Travel expenses (mileage, airline tickets, lodging, meals, etc.):
      - 1. for research and
      - 2. for meetings of professional societies where you expect to present your results.
    - E. Publication support.
    - F. Subcontracts (if any).
- Consider your audience (as you should in any written or oral presentation).
  - Pitfalls (i.e., do not do this); see Friedland and Folt (2009:33-34).