

- **UF Division of Sponsored Research (DSR)** - <http://www.rgp.ufl.edu/research/>
 - Resources for funding opportunities, proposal preparation, proposal processing, award administration, and research compliance; useful facts and figures, required forms and documents
- **Community of Science** - <http://fundingopps.cos.com/>
 - Most comprehensive web database of funding opportunities
 - Detailed search criteria, save and track searches, email alerts
 - Manage career profile, create CV, search researchers and institutions
- **UF FYI Digest Newsletter** - <http://www.rgp.ufl.edu/fyi/>
 - Biweekly publication of the University of Florida's Office of Research
 - Current funding opportunities, approaching deadlines, recent UF awards and proposal/awards database
- **GrantsNet** - <http://www.grantsnet.org/>
 - Funding opportunities for research and training in the sciences (in the biomedical, life, physical, and social sciences, as well as mathematics and engineering)
 - Current scholarships, internships and fellowships
 - Employment opportunities and resources to help manage your career
 - Search available jobs, post resumes, track applications, receive email alerts
- **Grants.gov** - <http://grants.gov>
 - Main portal to find and apply for federal government grants
 - Download applications; email alerts

- **National Science Foundation (NSF)**

http://www.nsf.gov/funding/pgm_list.jsp?org=NSF&ord=date

- Active funding opportunities, email alerts

- **The Grantsmanship Center** - <http://tgci.com/funding.shtml>

-International funding opportunities; information of top grantmaking foundations and corporate giving by state

- **The Grantsmanship Center** - <http://foundationcenter.org/>

-Foundation finder, current requests for proposals, grant and grantmaker stats, subscribe to free newsletters and the RFP bulletin

- **National Institutes of Health (NIH)** - <http://grants.nih.gov/grants/guide/>

- Funding opportunities and program announcements, policies and guidelines, email alerts
- Training grants, fellowships, and loan repayment programs; variety of career resources

Proposal Development

Developing a competitive grant proposal involves the following steps:

- A. Planning
- B. Research
- C. Writing

Planning

1. Define your project

- a. Identify the problem you plan to address
 - Research area that is not overworked
 - Review the literature
 - Significance: does research address important problem?
 - Identifiable information gap: new need or refinement
 - Innovation: is it original, challenge existing paradigms
 - Impact: Can make contribution that advances the field
 - Is the problem timely? Hot topic area
 - Is it fundable?

Planning

2. Identify your project goal

a. Means to address the problem

- Central subject/theme of your proposal
- Can be achieved within the parameters of grant
- Does it have intellectual merit
- Are there significant outcomes
- Are you excited about it?
- Is it saleable?

3. Seek critical feedback from colleagues

4. Refine your idea

5. Identify your target audience

6. Identify your geographic coverage

7. Determine project duration

8. Identify required expertise and resources

a. Personnel, equipment, facilities, partners, collaborators, time

9. Determine funding level

Research

1. Conduct detailed literature review

- a. Assemble key and pertinent publications
- b. Ground project in strong theoretical basis
- c. Identify directions of ongoing research and any information gaps
- d. Defend why this project is relevant, needs to be conducted, and appropriate to target audience

2. Identify potential funding sources

- a. Conduct initial broad-scale search
- b. Examine related COS keywords
- c. Determine potential subject areas and keywords: brainstorm

COS Keywords

Animal Behavior or Ethology

Biodiversity

Biogeochemistry

Biological Sciences

Bioremediation

Conservation Biology

Ecology

Ecosystems

Environmental Biology

Environmental Restoration or Remediation

Evolutionary Biology

Genomics

Global Change

Molecular Genetics

Terrestrial Ecology

Watersheds

Wetlands

Wildlife

Conservation Biology

Endangered Species

Environmental Conservation

Environmental Education

Heritage

Invertebrate Zoology

Natural Resources

Wildlife

Native Insect Pollinators

Agricultural Systems

Non-Agricultural Systems

Pollination Services and Crop Yield

Community-level Diversity and Species Abundance

Large Farm Small Farm

Public/Private Property Natural Areas

Pollinator-Friendly Practices
(Assess, Protect, Enhance)

Invasive Species

Impacts from Chemicals

Economic
(Yield, Investment, Sustainability)

Information Transfer

Training and Outreach

Food Security

National Security

Pollinator-Friendly Practices

Educational Exhibits

Municipalities, Agencies

Corporations, Golf Courses

Education and Outreach
(Adults, Youth)

Citizen Science

Urban Reserves

Understanding, Motivation

Species Conservation

Diversity Conservation

Plant Conservation

Habitat Management

Movement Corridors

Inventories

Training

Disturbance, Climate Change

Research

2. Identify potential funding sources

- d. Refine your search

3. Acquire RFP and guidelines and review them carefully

- a. Eligibility
- b. Geographic scope
- c. Funding level and limitations
- d. Due date
- e. Proposal format and content
- f. Evaluation/review criteria
- g. Program officer

4. Review recent awards

- a. Who and what is being funded
- b. Award amounts
- c. Sample proposals

5. Gather all necessary forms

- a. Sponsor- and UF- specific

Writing

1. Prepare schedule

- a. Identify proposal due date (sponsor)
- b. Determine when complete proposal is due to UF (DSR)
- c. Coordinate with your department's fiscal office to review budget
 - Preparation of draft budget for review can save you time later on
- d. Work backwards from above dates to set a schedule that works
- e. Set milestones for completion

2. Develop initial proposal outline

- a. Follow headings/sections outlined in guidelines
- b. Format document
 - margins, font size, type density, line spacing, page limits
- c. Follow guidelines – you must comply EXACTLY

3. Use strait forward language to inform reader (should be easy to spot and understand)

- a. The target audience is...
- b. The proposed research is innovative because...
- c. The findings will advance the field by...

Generic Proposal Outline

- A. Application Cover Sheet** (Basic facts - organization, PI's, contact information, and amount requested)
- B. Project Summary** (Abstract)
- C. Project Description**
 - 1. Introduction** (Broad statement of relevance to sponsor program)
 - 2. Statement of Need** (What is the need addressed by your proposal and tell why this need is important)
 - 3. Goals and Objectives** (Specific Aims) (What you plan to accomplish)
 - 4. Background and Significance**
 - a. Significance (Global view of the impact/benefits the project results will have – Justify why work is required)
 - b. Literature Review (Include brief overview of pertinent literature)
 - 5. Preliminary Data** (What you accomplished – Supports research direction)
 - 6. Research Design and Methods**
 - a. Approach and Rationale (Reason for selection)
 - b. Detailed Methods (Key equipment, supplies, controls and replications to be used, subjects)
 - c. Statistical Analysis
 - d. Expected Outcomes)
 - e. Potential Problems and strategies to address problems/ alternate approaches
 - 7. Expected Benefits or Outcomes**
 - a. Dissemination of Results
 - 8. Evaluation Criteria**
 - 9. Schedule of Completion**
 - 10. Project Team** (List key project personnel, time commitment/% effort, and responsibilities)
 - 11. Project Management**
 - 12. Collaboration**
 - 13. Facilities and Resources** (Laboratory, office, computers, major equipment, databases, etc.) (completed for all PI's)
- D. Biographical Sketches**
- E. Literature Cited**
- F. Budget**
- G. Budget Justification**
- H. Supplementary Documents**
 - A. Letters of Support or Commitment
 - B. Supporting Documents
 - C. Research and Evaluation Plan

Writing Tips

1. Use clear, concise sentences and language

- Avoid long, complicated explanations
- Use simple, appropriate vocabulary – aim for general audience
- Define specific terms
- Each sentence should have a purpose
- Avoid abbreviations, clichés, and ambiguous statements
- Avoid uncertainty and overstatements
- Don't force information

2. Employ hierarchical formatting (follow your detailed outline)

- Set headings, key words/phrases apart with italics, bold, underline

B. STUDY DESIGN AND METHODS

1. Data Collection

- a) Population:*
- b) Instrument:*
- c) Cohort Selection:*

D. Audience. The target audience for this study is

- Lead readers through your proposal
- Reference magazine or newspaper articles
- Employ short, well-crafted paragraphs-each should have single, key topic

Writing Tips

3. Avoid easy mistakes

- Spelling and grammar
- Common to mistake words – *Principal* or *Principle*
- Put best foot forward

4. Grab the reader's attention

- Entice them to read more

5. Make good use of diagrams, charts and tables

- Picture is often worth a thousand words
- Better way to convey complex idea, indicate relationships or showcase data

Rubric

Table 3. A scheme for classifying curatorial status of FLMNH Lepidoptera, modified from McGinley (1989, 1992).

Level Description

- 1 *Conservation problem***, specimens deteriorating, in danger of pest attack, immediate attention needed.
 - 2 *Specimens unprepared***, inaccessible, not sorted to major Lepidoptera groups (superfamily, family, subfamily)
 - 3 *Specimens unprepared***, accessible, sorted to major Lepidoptera groups (superfamily, family, subfamily)
 - 4 *Specimens prepared***, inaccessible, not sorted to major Lepidoptera groups (superfamily, family, subfamily)
 - 5 *Specimens prepared***, accessible, sorted to major Lepidoptera groups (superfamily, family, subfamily) and stored in appropriate location within main collection
 - 6 *Specimens prepared***, identified to species, ready for integration
 - 7 *Specimens prepared and fully integrated***, sorted by sex and locality, header labels in place
 - 8 *Data captured***, specimen-level inventory (Level 7 + data entered into Lepidoptera database)
-

Design



Audio directs attention to colored squares on the left of the exhibit and poses several questions:

1. Will the temperature of all three squares be the same?
2. If not which one do you think will be warmer?

Audio asks the participant to touch the squares and test their reasoning

Prompt guides participant to use cell phone to access **audio** of scientist describing her observations and environmental information about her research site

Prompt guides participant to access **Call the Wild website** using their cell phone to view additional examples of seasonal color forms in butterflies and other insects



Data

Table 2. Numbers of prepared specimens of Lepidoptera families in the FCA collection.

Butterflies		Moths					
Family	Specimens	Family	Specimens	Family	Specimens	Family	Specimens
Nymphalidae	119,425	Zygaenidae	30,669	Sphingidae	3,561	Sesiidae	804
Pieridae	95,708	Arctiidae	24,794	Drepanidae	1,178	Hepialidae	669
Lycaenidae	78,213	Notodontidae	7,262	Geometridae	1,166	Thyatiridae	415
Papilionidae	15,942	Noctuidae	6,892	Saturniidae	1,111	Pyralidae	373
Hesperiidae	7,099	Lymantridae	5,934	Bombycidae	1,012	Limacodidae	270
Riodinidae	1,116	Lasiocampidae	4,623	Cossidae	1,000	Other moths	18,150
Subtotal: 317,503		Subtotal: 109,883					
TOTAL: 427,386							

Situation or Condition



Fig. 3. Examples of storage and curatorial status of the Brower Collection. **A.** About 1% of the 4000 containers of various types housing prepared specimens, stacked in the second floor compactors. **B.** Poorly sealed cardboard boxes containing prepared material. **C.** A well-curated (level 7) drawer of satyrines from the main collection. **D.** A typical drawer of mixed Lepidoptera, comprising specimens from at least 8 Lepidoptera families. **E.** Example of drawer with loose-fitting glass lid, inappropriate for long-term preservation. **F.** A series of zygaenid moths, with only the first labeled with locality information. **G.** Some of the c. 200 containers housing unprepared material, the majority providing limited defence against insect pests. **H.** Unprepared, field-pinned Lycaenidae. **I.** Unprepared Satyrinae layered between cotton wool. **J.** Unprepared, unsorted papered specimens of all butterfly families, the most common storage method for unprepared specimens.

Process or Protocol

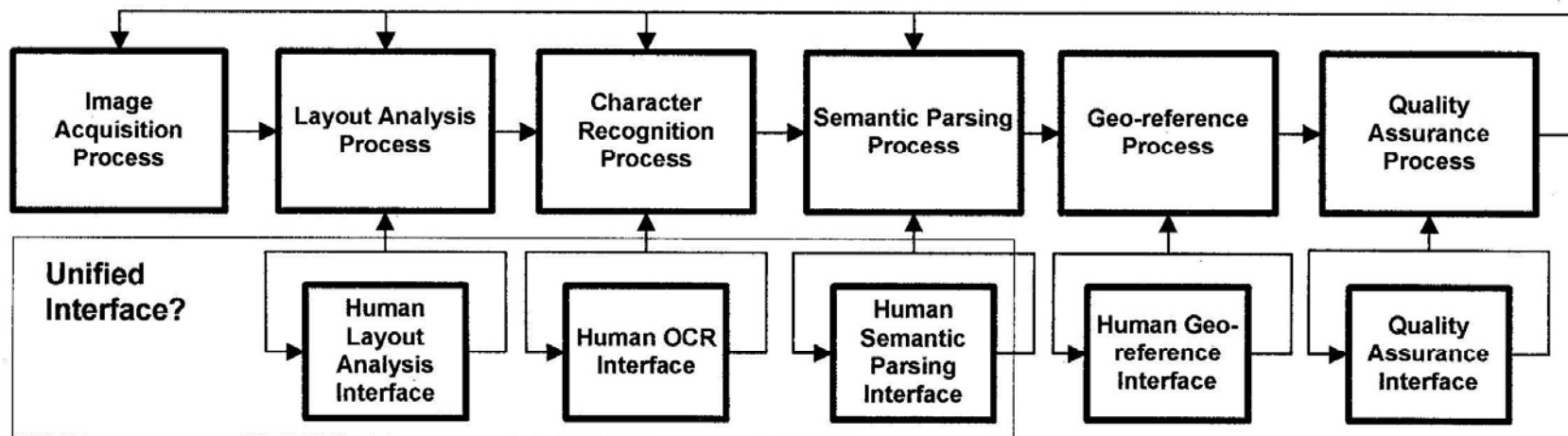


Figure 2. Transformative processes in testbed workflow

Project Title

Overview

- First impression
- Should be attention-grabber
- Clear, concise and descriptive statement that conveys key outcome of project
- Be creative – to a point
- Use simple language that can be easily understood (general audience)

Development

- Identify keywords from proposal
- Review primary goal and expected outcomes
- Brainstorm combinations
- Identify 3-5 options and get reactions from others
- Refine as needed

Poor Choice: *Papilio demoleus*: An Invasive Old World Swallowtail

Better Choice: Evaluating the Economic Impact of an Invasive Pest Butterfly on the Florida Citrus Industry

Other Examples

- The Development of an Open-source Web Publishing Platform to Bring History and Heritage Museums into the Era of Web 2.0
- Labs in Life Interface: Bringing Real Science to Public Audiences
- Development of a Sustainable Production Platform for Renewable Petroleum Based Oils in Algae
- Holocene Hunter-gatherer Plant Use and Foraging Choice, a Test from Minas Gerais, Brazil
- Magnetic Reconnection and Distribution of Accelerated Electrons in Solar Flares
- Infectious Disease Control and Bioresource Banking for the Amphibian Extinction Crisis

Project Summary (Abstract) (1 Page Max)

1. Arguably one of the most critical components of proposal
2. Provides overview of project and plan of work
 - answers who, what, where, why
3. Well-written, concise and motivating
 - Should guide reader through your project
 - Make it easy for reader to find important information
 - Raise excitement about project
4. Content should match rest of proposal
5. Craft after main proposal narrative is complete

Project Summary (Outline)

- **Establish relevance/importance of proposal to sponsor program area as outlined in RFP**
 - ✓ Clear, concise statement
 - ✓ Grab the reader's interest
- **Provide brief summary of the current knowledge in this area**
 - ✓ Explain the importance of your subject
- **Explain existing gap in the knowledge base**
 - ✓ What is the need addressed by your proposal?
 - ✓ Tell why this gap is an important problem

- **Overall goal that is to be addressed (broad statement)**

- **Central Hypothesis**

- ✓ Must relate to your overall goal
 - ✓ Present supporting preliminary results (if available)

- **Proposal objectives**

- ✓ Simple, broad and focused on your hypotheses/goal

- **Methodology**

- ✓ What will you do and how will you do it
 - ✓ Target audience (if relevant)
 - ✓ Discuss research environment (resources of lab, institution)
 - ✓ Project team
 - ✓ Collaboration

- **Demonstrate innovation**

- ✓ How is your project/approach unique

- **Intended outcomes and/or deliverables**

- ✓ Should directly relate to objectives

- **Strategic outcomes**

- ✓ Broader impacts of your work
 - ✓ Relate to overall field of study