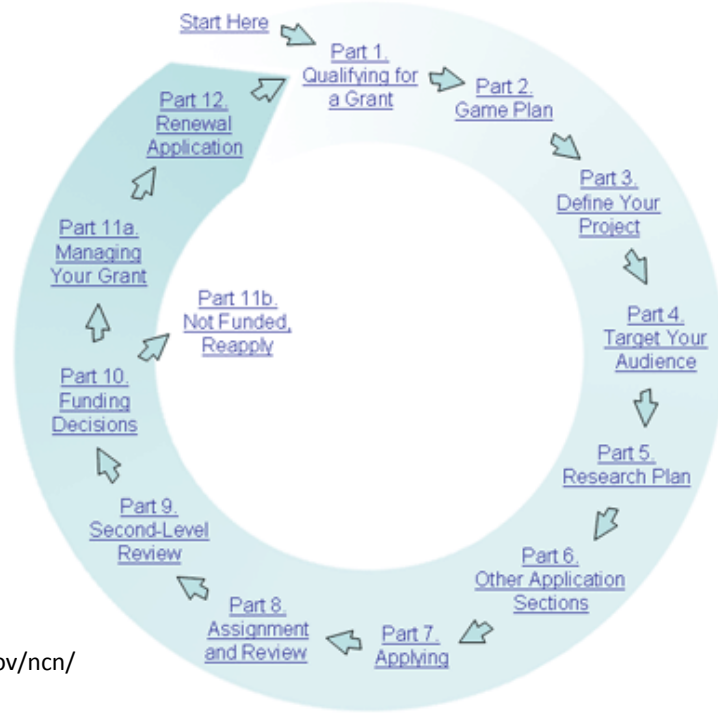


# Approaching Grant Writing

## Know Your Audience

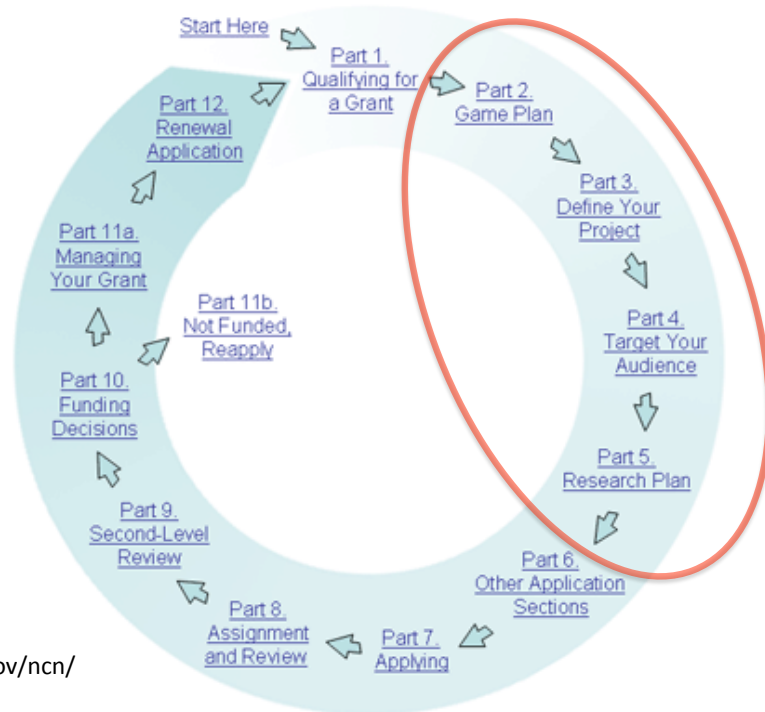
- Funding agencies and foundations have unique areas of interest, foci, styles and expectations.
- Examples of federal agencies:
  - National Institutes of Health (NIAID, NIGMS, NIMH, NCI... etc.)
  - National Science Foundation
  - Environmental Protection Agency
  - Department of Defense (DARPA, DTRA, USAMRMC... etc.)
  - National Air and Space Association
- Examples of state and local funding sources:
  - Commonwealth Health Research Board
- Examples of Private Foundations:
  - Bill and Melinda Gates Foundation
  - American Chemical Society
  - American Cancer Society
  - American Lung Association
  - Research Corporation
  - The Jeffress Memorial Trust

# NIH Grant Cycle



From:  
<http://funding.niaid.nih.gov/ncn/grants/cycle/default.htm>

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# NIH Peer Review Criteria

- **Significance:** Does the proposed research address an important problem?
- **Approach:** Are the approach and experiments well thought out and adequately developed?
- **Innovation:** Is the proposed research innovative or novel?
- **Investigator:** Do the PI or PI's have adequate training and experience applicable to the proposed research?
- **Environment:** Are the resources available to the PI sufficient for the proposed research?

# Planning your Proposal

- Get started early – preparing a proposal takes longer than you think.
- Must lay the foundation before you start writing.
  - Identify funding opportunities.
  - Develop a strategy for approaching the proposal.
  - Additional considerations.
- Notify the Office of Sponsored Programs or The GMU Foundation.
- Know the regulations (i.e. human subjects, vertebrate animals, select agents, stem cells and recombinant DNA)

# Developing the Concept/Idea

- Make sure that the concept is well thought out.
  - Clear hypotheses.
  - Make sure plan and experiments address central hypotheses.
  - Consider timeline and budget requirements
  - Be realistic in scope and timing.
- Familiarize yourself with the relevant literature.
  - State of the field
  - Novelty
  - Precedent
  - Need
- Does the proposal fit the Agency/Foundation mission?
- How well does it fit the scope and/or stated goals of the FOA.

# Funding Opportunities

- Search for funding opportunities
  - Agencies and Foundations
  - Active funding opportunity announcements (FOAs) - such as RFPs, RFAs, PA and BAAs
- Look for announcements that fit your research or broad/general announcements.
- After finding FOA, make sure that you are eligible and that your research fits the stated objective/scope of the FOA.
- Read FOA and provided instructions to determine specified:
  - Application process
  - Formatting
  - Budget (including whether grant covers indirects)
  - Determine application submission date(s) – and whether the deadline refers to receipt or postmark date/time.

# The Research Plan

- Research Plan:
  - Specific Aims: state concisely the goals of the project and summarize anticipated outcomes. ( usually 1 page)
  - Research Strategy: (number of pages often varies)
    - Background and Significance
    - Innovation
    - Approach

## Objectives, Hypotheses and Specific Aims

- First step in the grant writing process is to establish your objective and develop your hypothesis or hypotheses.
- Provide a brief project summary that contains the significance statement, the objective and the hypothesis.
- You can use the specific aims to frame/structure your proposal.

# Significance Statement

- Significance statement is the broadest and most general description of the research.

*Understanding how metal pollutants affect crops and forests is obviously of great importance to U.S. agriculture.*

*We wish to understand the biological implications of projected increases in global temperature on fish populations*

# Objectives and Hypotheses

- Objectives usually refers to broad and scientifically far reaching aspects of the proposed project.

*We will quantify responses of salmon to predicted increases in summer temperatures in their rearing grounds*

- 
- Hypotheses are more focused and usually put forth a specific set of testable conjectures.
    - The hypotheses should relate directly to the experiments.
    - Usually want to aim for five or fewer hypotheses.

*A water temperature increase of 18C in May will advance the hatching date of Atlantic salmon by 2 weeks.*

*Advancing the hatching date of Atlantic salmon by 2 weeks will reduce survival rates.*

# Specific Aims

- Specific aims are more focused than hypotheses.
- Proposals should generally have 2-4 specific aims.
- Each specific aim should address a specific question or hypothesis, relevant experimental methods or strategies, and anticipated outcomes.
- Proposal frequently can be organized around the specific aims.
- Use the significance statement to unify the specific aims... channel towards common over all goal.

From: "Writing Successful Science Proposals", 2<sup>nd</sup> ed., by A. Friedland and C. Folt.

# Involvement of Others

- As a new investigator, you may want to consider collaborating with or including more experienced and established colleagues or mentors.
- Consultants and Collaborators: can be included in order to fill gaps in your expertise and experience. Also may contribute resources that enhance capabilities.
  - Consultants may provide advice, services or even contribute in research, and they get paid for their contributions.
  - Collaborators play an active role in the research effort and may draw support from grant.
- Multiple PI Applications can present a dilemma:
  - Collaborative and multidisciplinary research where each PI contributes critical expertise.
  - NIH: funding rate for multi-PI grant proposals is much lower than for single PI proposals.

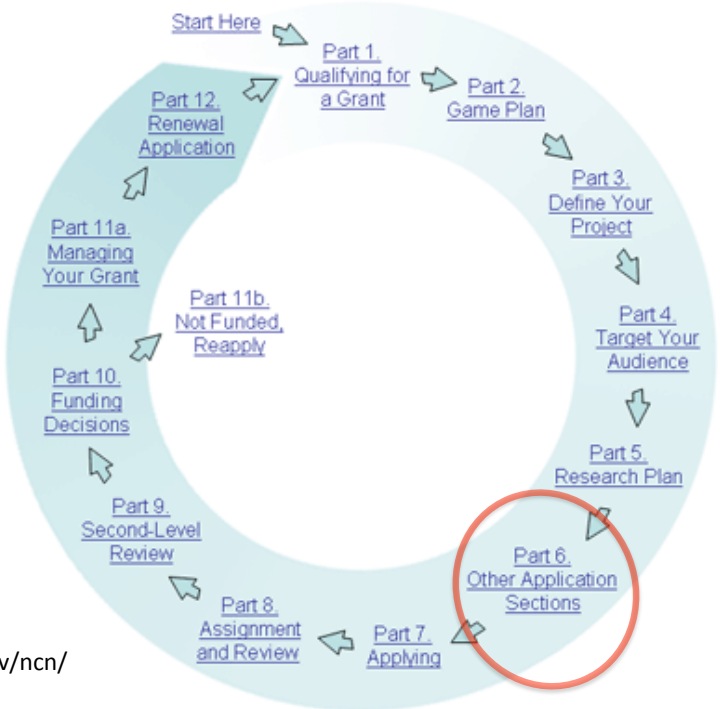
## Devil is in the Details

- Use clear and concise language, and keep paragraphs on point. (remember you will probably need to be able to address both the expert and the non-expert reviewer).
- Avoid jargon.
- Use active, rather than passive, voice.
- Use subheadings, and make the text easy to follow.
- Each paragraph should have a central point/focus.
- Spell out acronyms when they are introduced.
- Make sure to follow suggested formatting and proposal organization if provided.

## Proofreading/Edits

- Allow enough time:
  - to set the proposal aside for a period of time so that you can get a fresh perspective for final edits and proofreading.
  - for review by collaborators.
  - for possible review by independent expert.
  - to allow a final review of the entire proposal/application.
- Proposals with multiple contributors (such as when multiple PI's are involved) should have a single person serving as overall editor.
- Pay attention to details... misspellings, typos, grammatical mistakes... even formatting.
- How your proposal is written reflects on you and how you approach science and research.

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