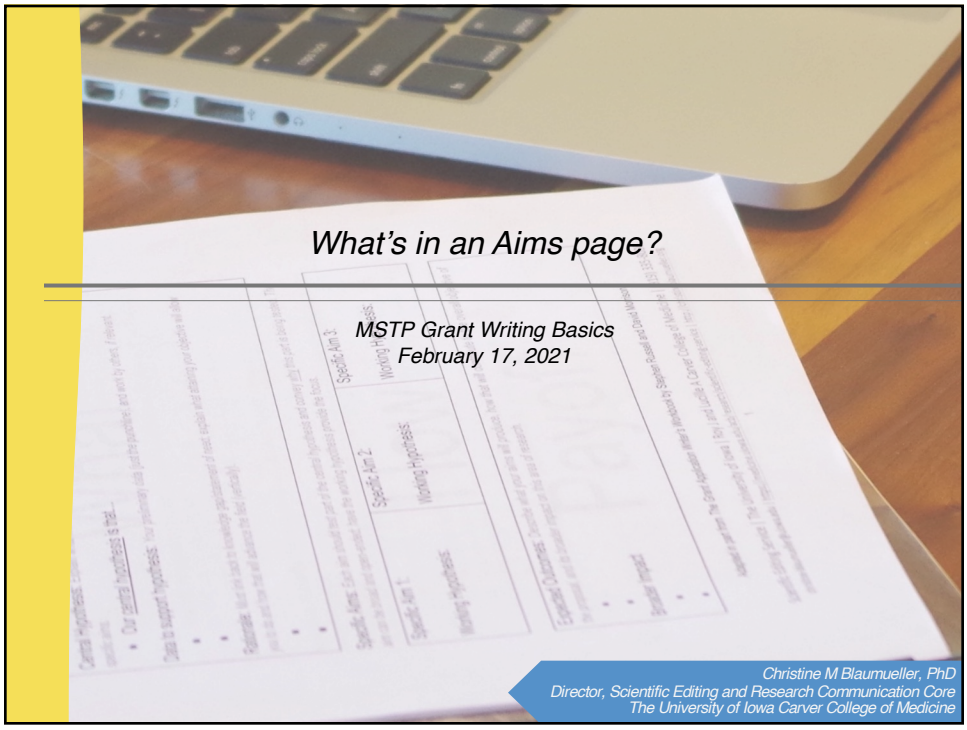
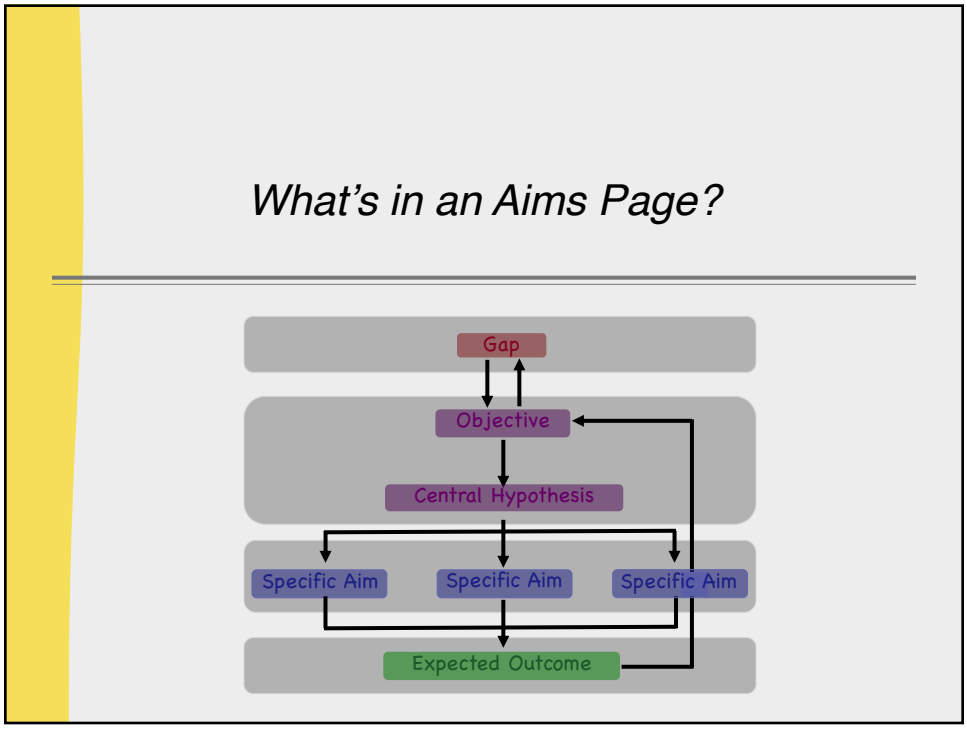

What's in an Aims page?
MSTP Grant Writing Basics
February 17, 2021
Christine M Blaumueller, PhD
Director, Scientific Editing and Research Communication Core
The University of Iowa Carver College of Medicine

1


What's in an Aims Page?
Gap
Objective
Central Hypothesis
Specific Aim
Specific Aim
Specific Aim
Expected Outcome

2

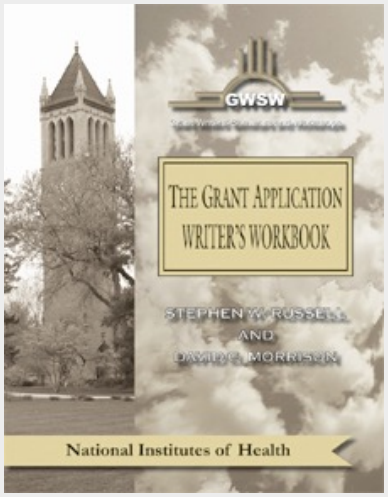
Resource:

Stephen W. Russell &
David C. Morrison

Writing Winning Grants

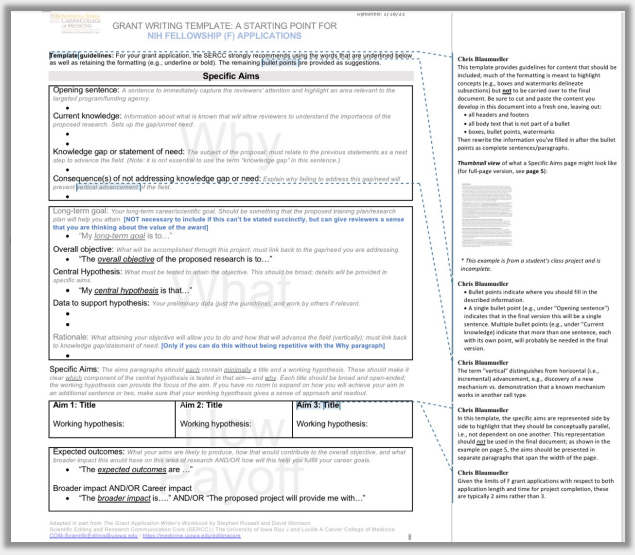
Grant Writers' Seminars
and Workshops, LLC

http://www.grantcentral.com



3

Resource: Template for Writing a Fellowship Grant



GRANT WRITING TEMPLATE: A STARTING POINT FOR
NIH FELLOWSHIP (F) APPLICATIONS

Template guidelines: For your grant application, the SERCC strongly recommends using the words that are underlined below, as well as retaining the formatting (e.g., underline or bold). The remaining bullet points are provided as suggestions.

Specific Aims

Opening sentence: *A sentence to immediately capture the reviewers' attention and highlight an area relevant to the targeted program/funding agency.*

Current knowledge: *Information about what is known that will allow reviewers to understand the importance of the proposed research. Sets up the gap/unmet need.*

Knowledge gap or statement of need: *The subject of the proposal must relate to the previous statements as a next step to advance the field. (Note: it is not essential to use the term "knowledge gap" in this sentence.)*

Consequence(s) of not addressing knowledge gap or need: *Explain why failing to address this gap/need will prevent* [critical advancement] *of the field.*

Long-term goal: *Your long-term career/scientific goal. Should be something that the proposed training plan/research plan will help you attain.* **[NOT necessary to include if this can't be stated succinctly, but can give reviewers a sense that you are thinking about the value of the award]**

- "My *long-term goal* is to…"

Overall objective: *What will be accomplished through this project; must link back to the gap/need you are addressing.*

- "The *overall objective* of the proposed research is to…"

Central Hypothesis: *What must be tested to attain the objective. This should be broad; details will be provided in specific aims.*

- "My *central hypothesis* is that…"

Data to support hypothesis: *Your preliminary data (just the punchline), and work by others if relevant.*

Rationale: *What attaining your objective will allow you to do and how that will advance the field (vertically); must link back to knowledge gap/statement of need.* **[Only if you can do this without being repetitive with the Why paragraph]**

Specific Aims: *The aims paragraphs should each contain minimally a title and a working hypothesis. These should make it clear which component of the central hypothesis is tested in that aim—and why. Each title should be broad and open-ended; the working hypothesis can provide the focus of the aim. If you have no room to expand on how you will achieve your aim in an additional sentence or two, make sure that your working hypothesis gives a sense of approach and readout.*

Aim 1: Title	Aim 2: Title	Aim 3: [title]
Working hypothesis:	Working hypothesis:	Working hypothesis:

Expected outcomes: *What your aims are likely to produce, how that would contribute to the overall objective, and what broader impact this would have on this area of research AND/OR how will this help you fulfill your career goals.*

- "The *expected outcomes* are …"

Broader impact AND/OR Career impact

- "The *broader impact* is…." AND/OR "The proposed project will provide me with…"

Adapted in part from *The Grant Application Writer's Workbook* by Stephen Russell and David Morrison.
Scientific Editing and Research Communication Core (SERCC) | The University of Iowa Roy J and Lucille A Carver College of Medicine
CVM-ScientificEditing@uiowa.edu | https://medicine.uiowa.edu/sercc/core

Chris Blaumueller
This template provides guidelines for content that should be included; much of the formatting is meant to highlight concepts (e.g., boxes and watermarks delineate subsections) but **not** to be carried over to the final document. Be sure to cut and paste the content you develop in this document into a fresh one, leaving out:
- all headers and footers
- all body text that is not part of a bullet
- boxes, bullet points, watermarks

Then rewrite the information you've filled in after the bullet points as complete sentences/paragraphs.

Thumbnail view of what a Specific Aims page might look like (for full-page version, see **page 5**):

** This example is from a student's class project and is incomplete.*

Chris Blaumueller
- Bullet points indicate where you should fill in the described information.
- A single bullet point (e.g., under "Opening sentence") indicates that in the final version this will be a single sentence. Multiple bullet points (e.g., under "Current knowledge) indicate that more than one sentence, each with its own point, will probably be needed in the final version.

Chris Blaumueller
The term "vertical" distinguishes from horizontal (i.e., incremental) advancement, e.g., discovery of a new mechanism vs. demonstration that a known mechanism works in another cell type.

Chris Blaumueller
In this template, the specific aims are represented side by side to highlight that they should be conceptually parallel, i.e., not dependent on one another. This representation should **not** be used in the final document; as shown in the example on page 5, the aims should be presented in separate paragraphs that span the width of the page.

Chris Blaumueller
Given the limits of F grant applications with respect to both application length and time for project completion, these are typically 2 aims rather than 3.

4

Why it matters that your Specific Aims page is well written

NIH Video "NIH Peer Review Revealed": https://www.youtube.com/watch?v=fBDxI6l4dOA&feature=youtu.be

5

Overview of review at NIH:

- 2–3 reviewers among ~ 20 panel members will read in entirety
- these reviewers will present and discuss it at meeting — and give a *preliminary* impact score
- they may revise opinions based on discussion
- non-presenting reviewers will get overview from Specific Aims page (or Project Summary, which is shorter)
- all reviewers contribute to final "overall impact" score

➥ Ultimately, reviewers who have read little more than your Specific Aims page will have a major influence on your ***overall impact*** score

6

Final Priority Score

OVERALL IMPACT

The likelihood for the project to exert a sustained, powerful influence on the research field(s) involved:

- in consideration of the following five core review criteria, and
- additional review criteria (as applicable for the project proposed)

7

Review criteria from which the overall impact score will be derived:

Fellowship (F) Applications

1. Applicant
2. Sponsors, Collaborators, Consultants
3. Research Training Plan
4. Training Potential
5. Environment & Institutional Commitment to Training

For more on review criteria and scoring system, see
NIH Peer Review informaition page: http://grants.nih.gov/grants/peer-review.htm
Or parent FOA: https://grants.nih.gov/grants/guide/pa-files/PA-19-192.html

8

Major Sections of Fellowship Grant

Introduction
1. Introduction to Application (Resubmissions)

Fellowship Applicant Section
2. Applicant's Background and Goals for Fellowship Training

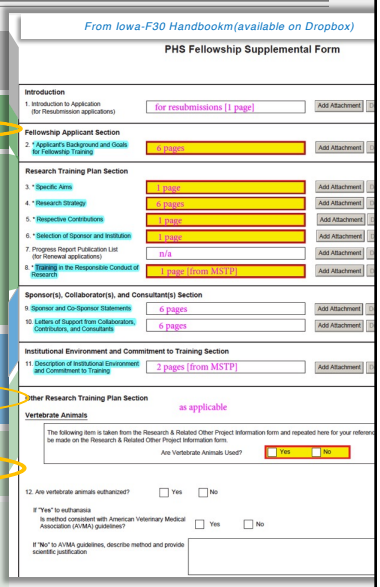
Research Training Plan Section
3. Specific Aims
4. Research Strategy
5. Respective Contributions
6. Selection of sponsor and Institution
7. Progress Report Publication list (Renewals)
8. Training in the Proposed Conduct of Research

Sponsor(s), Collaborator(s), and Consultant(s) Section
9. Sponsors and Co-Sponsor Statements
10. Letters of Support from Collaborators, Contributors, and Consultants

Institutional Environment and Commitment to Training Section
11. Description of Institutional Env and Commit to Training

Requested elsewhere…
- Project Summary/Abstract I Project Narrative
- Bibliography & References Cited
- Facilities & Other Resources I Equipment
- **Biosketch**

From Iowa-F30 Handbookm(available on Dropbox)


PHS Fellowship Supplemental Form

Introduction
1. Introduction to Application (for Resubmission applications) — for resubmissions [1 page] — Add Attachment

Fellowship Applicant Section
2. * Applicant's Background and Goals for Fellowship Training — 6 pages — Add Attachment

Research Training Plan Section
3. * Specific Aims — 1 page — Add Attachment
4. * Research Strategy — 6 pages — Add Attachment
5. * Respective Contributions — 1 page — Add Attachment
6. * Selection of Sponsor and Institution — 1 page — Add Attachment
7. Progress Report Publication List (for Renewal applications) — n/a — Add Attachment
8. * Training in the Responsible Conduct of Research — 1 page [from MSTP] — Add Attachment

Sponsor(s), Collaborator(s), and Consultant(s) Section
9. Sponsor and Co-Sponsor Statements — 6 pages — Add Attachment
10. Letters of Support from Collaborators, Contributors, and Consultants — 6 pages — Add Attachment

Institutional Environment and Commitment to Training Section
11. Description of Institutional Environment and Commitment to Training — 2 pages [from MSTP] — Add Attachment

Other Research Training Plan Section — as applicable

Vertebrate Animals
The following item is taken from the Research & Related Other Project Information form and repeated here for your reference. It must be made on the Research & Related Other Project Information form.
Are Vertebrate Animals Used? ☐ Yes ☐ No

12. Are vertebrate animals euthanized? ☐ Yes ☐ No
If "Yes" to euthanasia
Is method consistent with American Veterinary Medical Association (AVMA) guidelines? ☐ Yes ☐ No
If "No" to AVMA guidelines, describe method and provide scientific justification

9

Review criteria from which the overall impact score will be derived:

1. Applicant
   - Biosketch
   - Applicant's Background and Goals for Fellowship Training
2. Sponsors, Collaborators, Consultants
   - Sponsor and Co-sponsor statements
   - Applicant's Background and Goals for Fellowship Training
   - Letters of Support from Collaborators, Contributors, and Consultants
3. Research Training Plan
   - Research Strategy
   - Applicant's Background and Goals for Fellowship Training
   - Sponsor and Co-sponsor statements
4. Training Potential
   - Research Strategy
   - Applicant's Background and Goals for Fellowship Training
   - Sponsor and Co-sponsor statements
5. Environment & Institutional Commitment to Training
   - Description of Institutional Environment and Commitment to Training
   - Applicant's Background and Goals for Fellowship Training
   - Sponsor and Co-sponsor statements

The main criterion addressed by the Specific Aims page

Could also be addressed on Specific Aims page

For more on review criteria and scoring system, see
NIH Peer Review informaition page: http://grants.nih.gov/grants/peer-review.htm
Or parent FOA: https://grants.nih.gov/grants/guide/pa-files/PA-19-192.html

10

Points that should be clear from Specific Aims page:

- *Fellowship Applicant*
- *Sponsors, Collaborators, and Consultants*
- *Research Training Plan*
  - *Is proposed research plan of high scientific quality, and well integrated with the proposed training plan?*
  - *Is research project consistent with the applicant's stage of research development?*
  - *Is proposed timeframe feasible to accomplish the proposed research training?*
  - *Based on sponsor's description of his/her active research program, is applicant's proposed research project sufficiently distinct from the sponsor's funded research for the applicant's career stage?*
- *Training Potential*
- *Institutional Environment & Commitment to Training*

11

Example of funding agency expectations

NIH Individual Predoctoral Kirchstein NRSA Fellowships

- Should be:
  - specific
  - informative
  - non-redundant, and
  - ***succinct***
- Will be evaluated for its:
  - research training potential, and
  - scientific merit

12

Example of funding agency expectations

NIH Individual Predoctoral Kirchstein NRSA Fellowships

Research Training Plan:

1) Specific Aims page, no > 1 page (include 2–4 aims)
2) Research Strategy, no > 6 pages
   a. Significance
   b. Approach

13

Example of funding agency expectations

NIH Individual Predoctoral Kirchstein NRSA Fellowships

Research Training Plan:

1) Specific Aims page — ***in one page or less and for 2 aims***:
   - Concisely state ***goals*** of proposed research
   - Summarize ***expected outcomes*** → including impact of results on research field
   - Include concise listing of ***specific objectives*** of proposed research, e.g.,
     - test hypothesis,
     - challenge existing problem,
     - address critical barrier to progress in field, or
     - develop new technology

2) Research Strategy, no > 6 pages
   a. Significance
   b. Approach

14

Example of funding agency expectations

NIH Individual Predoctoral Kirchstein NRSA Fellowships

Research Training Plan:

1) Specific Aims page, no > 1 page (include 2–4 aims)

2) Research Strategy, no > 6 pages

Underpinning of goals – Include on Specific Aims page!

a) Significance: *Describe…*

1. ***importance of the problem or critical barrier*** *to progress that the proposed project addresses;*
2. ***strengths and weaknesses in the rigor of the prior research*** *(published and unpublished)* ***that serves as the key support*** *for the proposed project;*
3. ***how the proposed project will improve*** *scientific knowledge, technical capability, and/or clinical practice in one or more* ***broad fields****; and*
4. ***how*** *the concepts, methods, technologies, treatments, services, or preventative interventions that drive* ***this field will be changed*** *if the proposed aims are achieved.*

b) Approach

Expected outcomes – Include something about this on the Specific Aims page

15

Example of funding agency expectations

NIH Individual Predoctoral Kirchstein NRSA Fellowships

a) Significance

b) Approach: *Describe…*

Include strategy and some methodology/benchmarks (=>objectives), BUT not too much detail

1. ***overall*** *strategy, methodology, and analyses to be used…;*
2. *potential problems, alternative strategies, and* ***benchmarks for success****;*
3. *if the project is in the early stages of development, any strategy to* ***establish feasibility/address management*** *of any high risk aspects*
4. *how relevant* ***biological variables****, such as sex, are factored into research designs/analyses for studies in vertebrate animals/humans*
5. *Any procedures/situations/materials that may be* ***hazardous*** *to personnel and the precautions to be exercised*
6. *If research on Human Embryonic Stem Cells (hESCs) is proposed but an approved cell line from the NIH hESC Registry cannot be chosen, strong justification for why*
7. *If you are proposing to gain clinical trial research experience (i.e., you will not be leading an independent clinical trial), your role on the clinical trial*

Project-specific "maybe" (only if needed)

16

Common reasons for grant rejection

- no clear hypothesis / well-defined goals (aims too independent)
- specific aims do not test hypothesis or are interdependent
- proposal is not mechanistic / scientifically relevant
- application is not appropriate for the funding mechanism
- proposal is overly ambitious
- preliminary data are lacking
- investigator(s) qualified to carry out proposed experiments?
- failure to cite key publications / experiments
- inadequate description of experimental detail, alternative approaches, data interpretation
- lack of relevance to institute's mission

➥ In shortened NIH grant format (since 2010) —
failure to clarify overall significance / too much emphasis on detail

Top 10 Reviewer Concerns (NIH Regional Meeting 2009)

17

Issues that are apparent from Specific Aims page

- no clear hypothesis / well-defined goals (aims too independent)
- specific aims do not test hypothesis or are interdependent
- proposal is not mechanistic / scientifically relevant
- application is not appropriate for the funding mechanism
- proposal is overly ambitious
- preliminary data are lacking
- investigator(s) qualified to carry out proposed experiments?
- failure to cite key publications / experiments
- inadequate description of experimental detail, alternative approaches, data interpretation
- lack of relevance to institute's mission

Top 10 Reviewer Concerns (NIH Regional Meeting 2009)

18

Tips for writing the Specific Aims page

The present letter is a very long one, simply because I had no leisure to make it shorter.

Blaise Pascal (1623-1662)

Scientist, mathematician, physicist, philosopher, moralist & writer

19

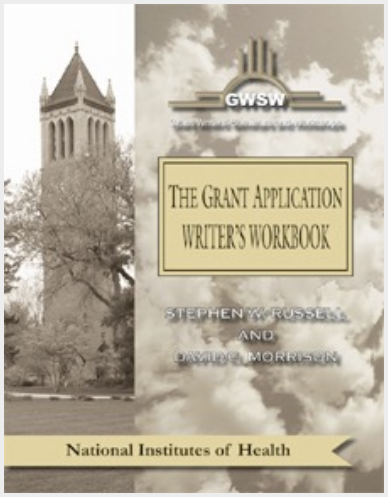
Resource:

Stephen W. Russell & David C. Morrison

Writing Winning Grants

Grant Writers' Seminars and Workshops, LLC

http://www.grantcentral.com



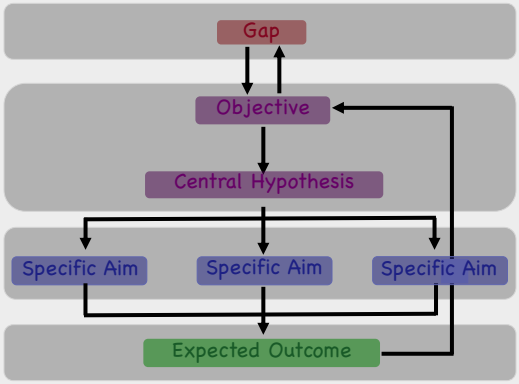
20

Writing a 1-page Specific Aims section –

First step:

- generate a bullet outline to help you make the logic of your project clear to the reader

➥ helps to ***link ideas effectively*** *and* ***avoid excess detail***



Background & Significance (of problem)
WHY?

Purpose
WHAT?

Plan
HOW?

Impact (of study)
WHY?

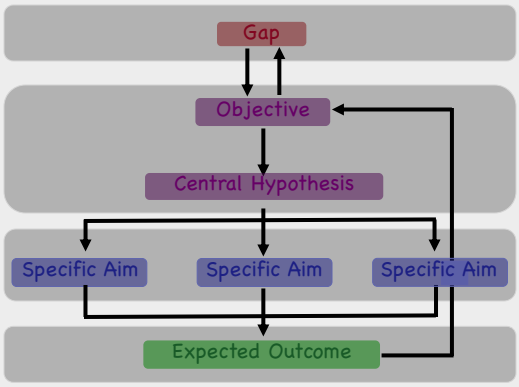
21

Writing a 1-page Specific Aims section –

First step:

- generate a bullet outline to help you make the logic of your project clear to the reader

➥ helps to ***link ideas effectively*** *and* ***avoid excess detail***



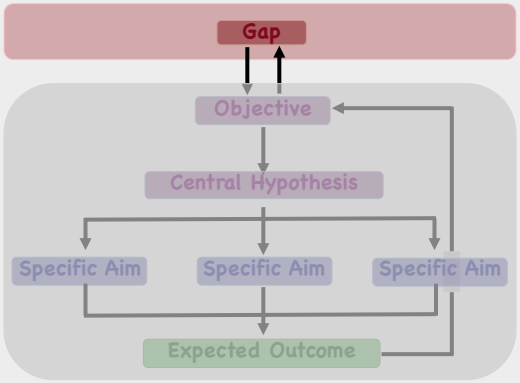
General to Specific

22

Writing a 1-page Specific Aims section –

Background/Significance paragraph:

- Opening sentences (1)
- Current knowledge (2)
- Gap in knowledge base (or unmet need) (3a)
- Why the gap (unmet need) is a problem (3b)



23

Writing a 1-page Specific Aims section –

Introductory paragraph:

- Opening sentence(s) (1) — immediately establish relevance of the proposal to agency mission

e.g. The NIH mission statement says that this agency seeks to fund:

- *science in pursuit of fundamental knowledge about the nature and behavior of living systems*

AND

- *application of that knowledge to extend healthy life and reduce the burdens of illness and disability.*

Final text for this sentence, from Example proposal 3:

The glaucomas are a leading cause of blindness in the United States, with over 2 million cases reported in 2005 and 3 million being projected by 2020 (1).

24

Writing a 1-page Specific Aims section –

Introductory paragraph:

- Current knowledge (2)
  - *purpose* — get all reviewers up to speed on current state of knowledge on proposal topic
  - should *not* be comprehensive — 2–3 sentences covering only information necessary to bring reviewers from most relevant older knowledge to edge of field
  - should set scene for presenting the gap (or unmet need)
  - bullets should lead reader to "jumping-off" point for application (i.e. *what needs to be done next*)

The absence of early and reliable detection…
Recently thin central corneal thickness (CCT), a highly heritable trait, was found to be ...
This feature is regulated primarily by…

25

Writing a 1-page Specific Aims section –

Introductory paragraph:

- Gap in knowledge base (3a)
  - key to creating Specific Aims section — all downstream logic flows from it
  - statement of what is holding back your field (vertical change)
  - this gap must be addressed by proposed research

… but the basis for its link to glaucoma is not yet understood.

26

Writing a 1-page Specific Aims section –

Introductory paragraph:

- The gap (unmet need) as a problem (3b)
  - › *purpose* — convey that this represents an important problem… i.e. that "vertical" advancement in the field awaits filling of the gap

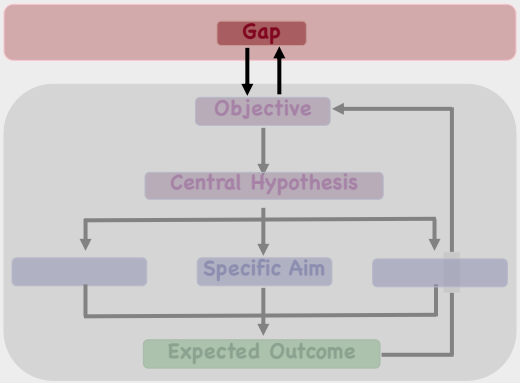
> Determining how CECs regulate CCT is expected to provide important insight into determinants of the onset of glaucoma.

27

Writing a 1-page Specific Aims section –

By end of background/significance paragraph, reviewers should:

- understand why your research area is relevant to agency's mission
- be up to speed with state of knowledge in the field
- understand the gap in the knowledge base, and that it is an important problem

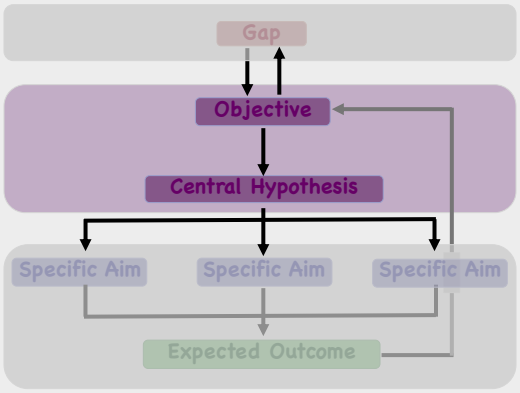


28

Writing a 1-page Specific Aims section –

Purpose paragraph:

- Long-term goal (4)
- Objective of the *proposed research* (5)
- Central hypothesis and how formulated (6)
- Rationale (7)



29

Writing a 1-page Specific Aims section –

Second paragraph:

- Long-term goal (4)
  - › *purpose* — project the continuum of research to be pursued over multiple funding periods (by your lab, as relevant to agency mission)
  - › must encompass the identified gap (unmet need)

Our *long-term goal* is to learn which characteristics of CECs can be used to effectively screen for glaucoma risk, and how CEC-based regulation may be manipulated for preventative and therapeutic purposes.

30

Writing a 1-page Specific Aims section –

Second paragraph:

- Objective of the *proposed research* (5)
  - › defines purpose of the proposed project (filling gap/unmet need)
  - › must be realistic to achieve over a finite period of time
  - › must clearly be the next logical step toward achieving long-term goal (linkage must be obvious)
  - › must have a defined endpoint (not simply "to study process x")
    - otherwise, when would you be done?
    - would overemphasize process, rather than product, of research

> The *objective* of the proposed research is to uncover genes that influence CECs and to determine how CECs regulate CCT.

31

Writing a 1-page Specific Aims section –

Second paragraph:

- Central hypothesis … (6a)
  - › *purpose* — provide focus for your grant application
  - › must link to objective
  - › must give direction to project => the best bet for accomplishing objective
  - › must be *objectively* testable (no predetermined conclusion)
  - › should have components that are individually testable (by aims)

> The *central hypothesis* of this application is that there is a genetic basis for CEC density, and that this in turn determines CCT and ultimately glaucoma susceptibility.

  - › if unmet need application, provide best bet as to ***how to meet the need***

32

Writing a 1-page Specific Aims section –

Second paragraph:

- … and how central hypothesis was formulated (6b)
  - › additional points to tell reader how central hypothesis was formulated, i.e. why you chose this as your best bet
    - based on preliminary data (if available)
    - based on the literature (complementary to your preliminary data?)

Our hypothesis has been devised on the basis of own preliminary data revealing that CEC density correlates exactly with overall CCT in 3 different genetic backgrounds of inbred mouse strains that model thick, intermediate, and thin CCT. This finding suggests a genetic basis for CCT and a relationship to CEC density.

33

Writing a 1-page Specific Aims section –

Second paragraph:

- Rationale (7)
  - › *purpose* — why you want to undertake this research, e.g. what will become possible that is not now
  - › must link back to gap identified in first paragraph – whose resolution will allow you to take the important next step
  - › opportunity to excite the reviewers!
  - › the art here is to deliver this exciting message without repeating of the "gap as a problem" verbatim

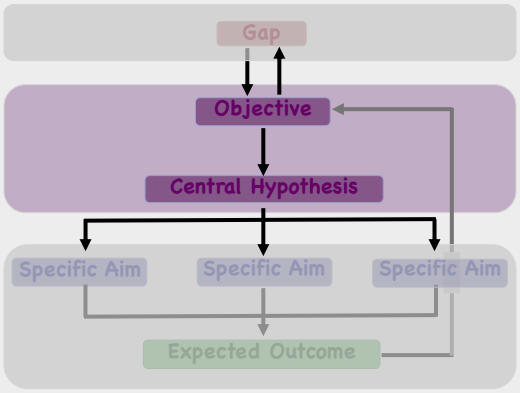
The *rationale* for the proposed research is that the identification of genetic determinants of CEC density will make it possible to perform early and reliable screening to assess glaucoma risk, and open doors to new preventative and therapeutic approaches involving the manipulation of CECs.

34

Writing a 1-page Specific Aims section –

By end of purpose paragraph, the reviewers should understand:

- in general, what you plan to do
- that what you are proposing will fill the gap that you have delineated



35

Writing a 1-page Specific Aims section –

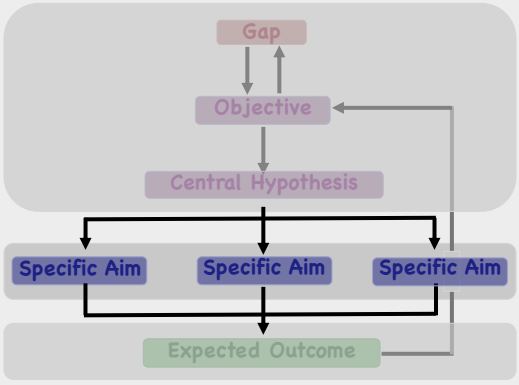
Plan section (Specific Aims paragraphs) (8):

- brief, informative, attention-getting headlines conveying why the research is being done ***
- each followed by:

  a focused *working hypothesis*

  or

  a brief description of approach (unmet need)



36

Writing a 1-page Specific Aims section –

Aims "paragraph":

- Headlines (8a), two in number (parallel, complementary)
  - *purpose*: attract a reviewer's attention and whet his/her interest
  - must link back to some part of your central hypothesis
  - should not be descriptive* (focused on what is being done); do not use words like "correlate" or "describe" if you have a hypothesis
  - make broad and open-ended

Specific Aim 2: Determine the extent to which the mapped CEC loci influence CCT.

* In the case of unmet-need based applications, the aims will describe what will be done.

37

Formula for a 1-page Specific Aims section –

Aims "paragraph":

- Headlines (8a), two to four in number (parallel, complementary)
  - make broad and open-ended

Specific Aim 2: Determine the extent to which the mapped CEC loci influence CCT.

Specific Aim 2: Determine whether mapped CEC loci influence CCT. ✗

If you don't know that CEC loci have an influence, broaden the scope of the aim

Specific Aim 2: Identify factors that influence CCT.

38

Writing a 1-page Specific Aims section –

Aims "paragraph":

- Working hypothesis (8b) * *or* the approach to accomplish needs-driven aim
  - › *purpose* — to focus / provide direction for the aim
  - › should be based on preliminary data (e.g. to warrant focusing on this vs. all other possibilities*)

Specific Aim 2: Determine the extent to which the mapped CEC loci influence CCT.

The *working hypothesis* for this aim is that loci affecting CEC density will have a corresponding positive or negative effect on CCT, as we found to be the case for the model locus cec1 in our preliminary data. This influence will be evaluated in the context of different genetic backgrounds through the use of congenic mouse strains. (rewritten from original)

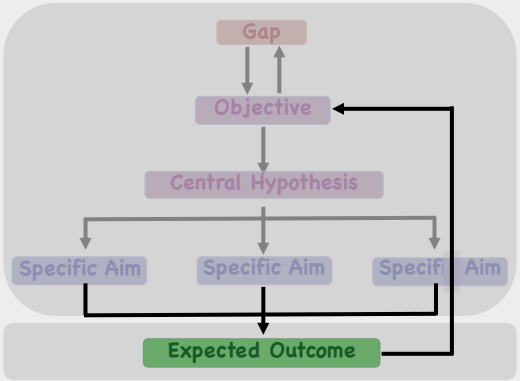
* **IF you have more space**, you may briefly indicate generally what kind of approach you will take after stating the working hypothesis

39

Writing a 1-page Specific Aims section –

Impact paragraph:

- expected outcome for aims (9)
- generality regarding positive impact (10)



40

Writing a 1-page Specific Aims section –

Impact paragraph:

- Expected outcomes (9)
  - *purpose* — present all expected outcomes in one place (makes it easier for the reviewer to see how the aims collectively validate the central hypothesis)
  - must have at least one outcome per aim (but can ultimately be merged into 1–2 sentences)
  - each outcome must link to the specific aim that will produce it
  - each outcome should be specific enough to convince reviewers that this project can accomplish it

The *expected outcome* of our study will be knowledge of the genes that influence CEC density, and thereby also CCT and glaucoma susceptibility. (rewritten from original)

41

Writing a 1-page Specific Aims section –

Impact paragraph:

- Generality regarding positive *impact* (10)
  - *purpose* — summarize general impact of expected outcomes
  - point out how the outcomes will collectively make a vertical advance in the field
  - point out how the outcomes will collectively contribute to the mission of the targeted funding agency

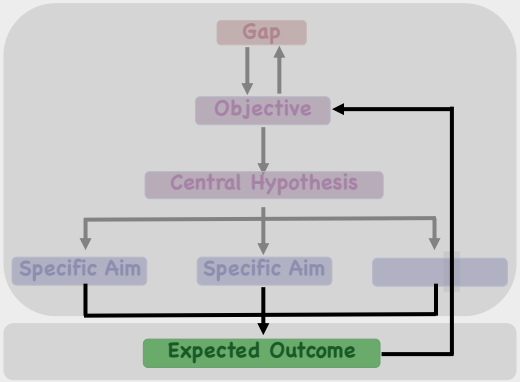
This will have an important *positive impact* in that these loci will represent specific risk alleles that can be used to evaluate glaucoma susceptibility and as target genes for preventative and therapeutic strategies targeting this disease. (rewritten from original)

42

Writing a 1-page Specific Aims section –

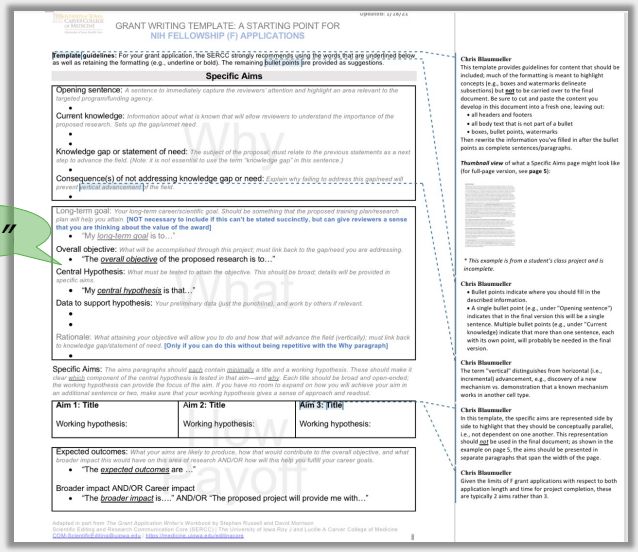
By end of impact paragraph, the reviewers:

- should know what return they can expect if they recommend funding of your application
- will hopefully be inspired to advocate your project



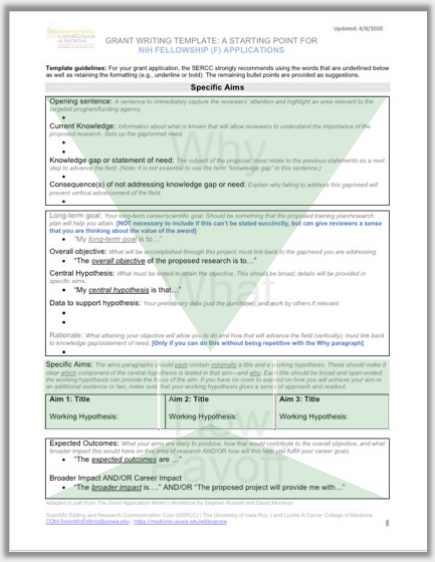
43

Make your bullet list using the template…



44

How this looks conceptually…



GRANT WRITING TEMPLATE: A STARTING POINT FOR NIH FELLOWSHIP (F) APPLICATIONS

Updated: 4/8/2020

Template guidelines: For your grant application, the SERCC strongly recommends using the words that are underlined below as well as retaining the formatting (e.g., underline or bold). The remaining bullet points are provided as suggestions.

Specific Aims

Opening sentence: *A sentence to immediately capture the reviewers' attention and highlight an area relevant to the targeted program/funding agency.*

Current Knowledge: *Information about what is known that will allow reviewers to understand the importance of the proposed research. Sets up the gap/unmet need.*

Knowledge gap or statement of need: *The subject of the proposal; must relate to the previous statements as a next step to advance the field. (Note: it is not essential to use the term "knowledge gap" in this sentence.)*

Consequence(s) of not addressing knowledge gap or need: *Explain why failing to address this gap/need will prevent vertical advancement of the field.*

Long-term goal: *Your long-term career/scientific goal. Should be something that the proposed training plan/research plan will help you attain.* **[NOT necessary to include if this can't be stated succinctly, but can give reviewers a sense that you are thinking about the value of the award]**

- "My *long-term goal* is to…"

Overall objective: *What will be accomplished through this project; must link back to the gap/need you are addressing.*

- "The *overall objective* of the proposed research is to…"

Central Hypothesis: *What must be tested to attain the objective. This should be broad; details will be provided in specific aims.*

- "My *central hypothesis* is that…"

Data to support hypothesis: *Your preliminary data (just the punchline), and work by others if relevant.*

Rationale: *What attaining your objective will allow you to do and how that will advance the field (vertically); must link back to knowledge gap/statement of need.* **[Only if you can do this without being repetitive with the Why paragraph]**

Specific Aims: *The aims paragraph should each contain minimally a title and a working hypothesis. These should make it clear which component of the central hypothesis is tested in that aim—and why. Each title should be broad and open-ended; the working hypothesis can provide the fi- cus of the aim. If you have no room to expand on how you will achieve your aim in an additional sentence or two, make sure that your working hypothesis gives a sense of approach and readout.*

Aim 1: Title	Aim 2: Title	Aim 3: Title
Working Hypothesis:	Working Hypothesis:	Working Hypothesis:

Expected Outcomes: *What your aims are likely to produce, how that would contribute to the overall objective, and what broader impact this would have on the area of research AND/OR how will this help you fulfill your career goals.*

- "The *expected outcomes* are …"

Broader Impact AND/OR Career Impact

- "The *broader impact* is…." AND/OR "The proposed project will provide me with…"

Adapted in part from *The Grant Application Writer's Workbook* by Stephen Russell and David Morrison

Scientific Editing and Research Communication Core (SERCC) | The University of Iowa Roy J and Lucille A Carver College of Medicine
COM-ScientificEditing@uiowa.edu | https://medicine.uiowa.edu/sed/sercc

Why

What

How

Opening sentence
Current knowledge
Gap in knowledge/why it matters

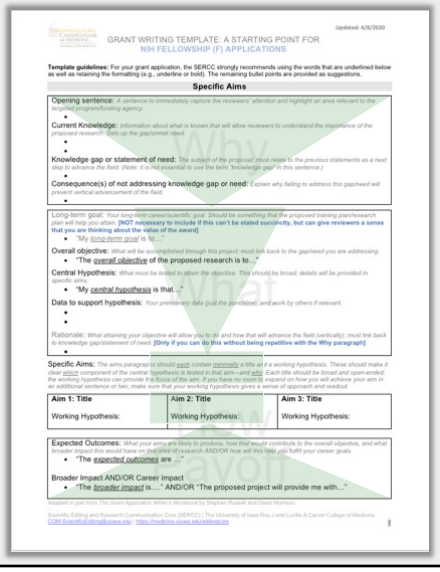
Long-term goal
Objective (proposed research)
Central hypothesis (or urgent need)
Rationale for study

Aims Title
Hypothesis of Aim

Expected outcomes
Broader impact
Impact on career goals

45

Or maybe more like this?



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Rationale for study

Aims Title
Hypothesis of Aim

Expected outcomes
Broader impact
Impact on career goals

46

Lexicon for Specific Aims page bullet points

A Grant-Writing (Specific Aims page) Lexicon
Christine Blaumueller, PhD, summarizing
Grant Writers' Seminars & Workshops, LLC

Opening sentence/hook: What makes the proposed research relevant to the funding agency's mission.

Current knowledge/background: Just enough information to set the scene for the reviewers with regard to current knowledge on the topic.

Gap in knowledge base/problem: Statement of what is holding your field back from substantive progress; must be addressed by the proposed research.

Why the gap is a problem/significance of problem: The substantive advance that needs to be made.

Long-term goal: The continuum of research of which this particular proposal is a part.

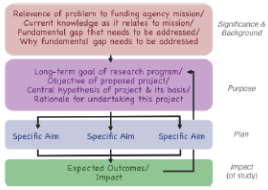
Objective of this proposal/purpose: Must fill the gap that has been identified.

Central hypothesis and its basis: The overall theory that will be tested by the proposed research, and the background (preliminary data and literature) that makes this likely. Must be able to test the hypothesis objectively.

Rationale: What your research will make possible that is not possible now.

Specific Aims titles: Independent but related aspects of the central hypothesis; will be tested in parallel (as far as possible).

Working hypothesis: Statement of sub-hypothesis to be tested in an aim, to clarify its focus (must give indication of what will be tested and how).



Expected outcomes: What you think the aims will accomplish.

Positive impact/contribution/deliverables:
- How the expected outcomes will make a ***vertical*** advance in the field.
- How the proposed research is expected to contribute to the funding agency's mission (the return on its investment).

47

Writing a 1-page Specific Aims section –

In expanding from the bullets, it will help if you start early enough to:

- take a break before starting to expand the outline into sentences and paragraphs
- get constructive criticism from colleagues (fellow students)
- cycle through making sure that:
  - › each component meets its purpose
  - › each component links to the others in the right way
  - › the progression of the logic is linear

48

Writing a 1-page Specific Aims section –

Be sure to:

- leave nothing to the interpretation of the reviewers (spell out your meaning)
- *italicize* or *italicize and underline* (depending on font style) key words but don't overdo it (with respect to frequency or style)
- minimize number of citations in this section (maximally linchpin references)

49

Grantsmanship Tips 101

GET FEEDBACK

SHOW YOUR DRAFT APPLICATION TO A COLLEAGUE

SHOW YOUR DRAFT APPLICATION TO A COLLEAGUE… **WHO DOES NOT ALREADY KNOW WHAT YOU INTEND TO DO**

SHOW YOUR DRAFT APPLICATION TO A COLLEAGUE… **WHO IS NOT YOUR BEST FRIEND**

GRANT WRITING FOR SUCCESS
LeShawndra N. Price, Ph.D., NIMH, NIH
Dana Plude, CSR, NIH
Henry Khachaturian, Ph.D., OEP/NIH

50

Grantsmanship Tips 101

YOUR DRAFT REVIEWERS NEED TO UNDERSTAND

- What you intend to do
- Why you believe it is important to do
- Exactly how you are going to do it

IF THEY DON'T GET IT, YOU MUST REVISE YOUR APPLICATION.

LEAVE ENOUGH TIME FOR REVISIONS

LeShawndra N. Price, Ph.D., NIMH, NIH
Dana Plude, CSR, NIH
Henry Khachaturian, Ph.D., OEP/NIH

51

Size Matters

- Mind the page limits – Grants.gov will reject the application
- Do not 'overstuff' by shifting content to a section where it does not belong (e.g., using Human Subjects section or appendix to spell out details of methodology)
- Use limited space thoughtfully and effectively – don't waste space on reiterating points
- Make your application 'read like butter'

LeShawndra N. Price, Ph.D., NIMH, NIH
Dana Plude, CSR, NIH
Henry Khachaturian, Ph.D., OEP/NIH

52

Substance Matters

- Focus on the MAIN objectives
- Clearly link methods to AIMs/Objectives
- Know your audience – 3 (or so) assigned reviewers not all of whom have focal expertise in your area.
- Be FOCUSED, CONCISE AND SUCCINCT
- http://public.csr.nih.gov/Pages/default.aspx

53

Style Matters

- **Proofread for typo's** – they are not only annoying but detract from intelligibility
- **Organization** - look at CSR Reviewer Resources to see what the REVIEWERS are instructed to evaluate; map the organization of your application to the Reviewers' expectations – Significance is critical
- **Reference citations** – make sure the references agree with the citations in the text; missing or erroneous errors are costly
- **Make figures LEGIBLE** with labeled axes

54