

Career Development Series 2023

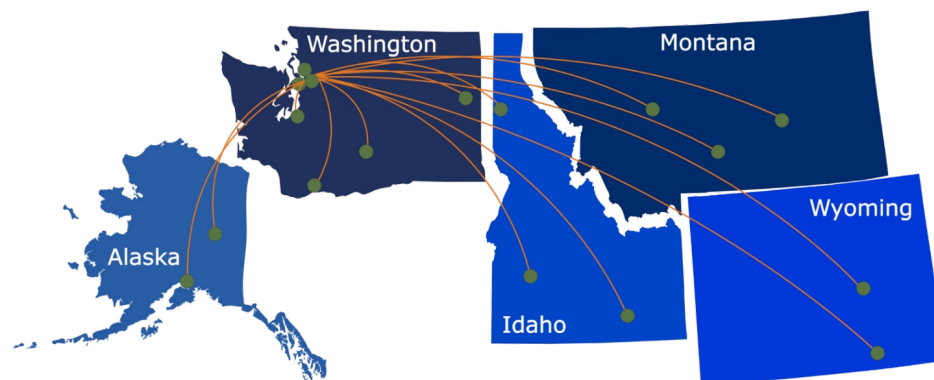
Specific Aims: Steps to Success

Presentation will begin at 12:00 PM (PT)



ITHS

Institute of **Translational** Health Sciences
ACCELERATING RESEARCH. IMPROVING HEALTH.



What We Offer:

- 1 Research Support Services:** Members gain access to the different research services, resources, and tools offered by ITHS, including the ITHS Research Navigator.
- 2 Community Engagement:** Members can connect with regional and community based practice networks
- 3 Education & Training:** Members can access a variety of workforce development and mentoring programs and apply for formal training programs.
- 4 Funding:** Members can apply for local and national pilot grants and other funding opportunities. ITHS also offers letters of support for grant submissions.

Contact ITHS

Director of Research Development



- Project Consultation
- Strategic Direction
- Resources and Networking

Melissa D. Vaught, Ph.D.
ithsnav@uw.edu
206.616.3875

Scientific Success Committee

- Clinical Trials Consulting
- Guidance on Study Design, Approach and Implementation
- Feedback on Design and Feasibility

[https://www.iths.org/investigators/
services/clinical-trials-consulting/](https://www.iths.org/investigators/services/clinical-trials-consulting/)

Upcoming Career Development Series 2023

- **March 2, 2023 – Team Science Seminar Series #6 -- Leading with Intention: Foundational Skills for Handling Interpersonal Conflict**
- April 6, 2023 – Team Science Seminar Series #7 -- Creating Engagement: Facilitation from Chaos to Construct *
- May 4, 2023 – Team Science Seminar Series #8 -- Diversity, Equity, and Inclusion in Team-Based Research *
- June 1, 2023 – Team Science Seminar Series #9 -- Engaging Communities in Interdisciplinary Research *
- June 15, 2023 – How to Prepare My Career Development Award (K Award) *
- August 2, 2023 – How to Prepare for a Biostats Consult *

Feedback

At the end of the seminar, a link to the feedback survey will be sent to the email address you used to register.

Career Development Series 2023

Specific Aims: Steps to Success

Presented by Laura-Mae Baldwin, MD, MPH



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Learning Objectives

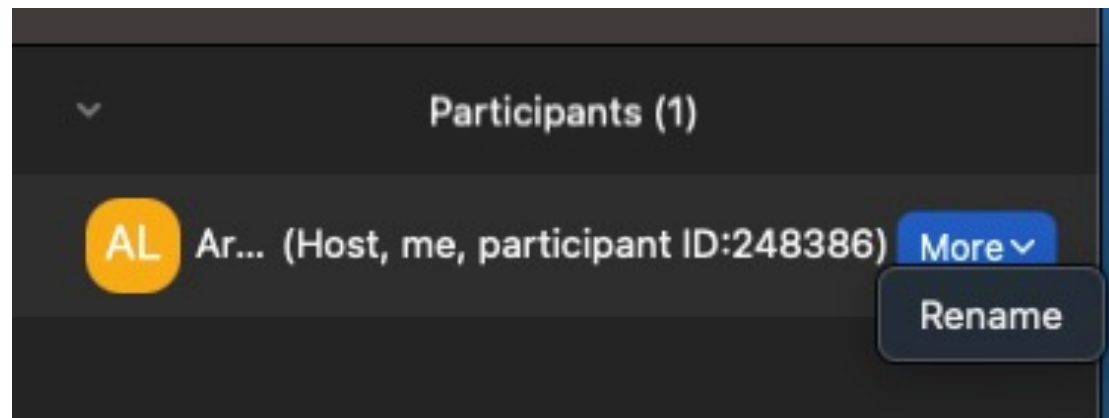
- 1 Identify the four critical sections of a Specific Aims page
- 2 List the important components of each Specific Aims section
- 3 Name the most common reviewer critiques of Specific Aims pages

Today's Session

- Presentation: 35 minutes
- Hands-on “analysis” of a Specific Aims page: 25 minutes
 - Pair up with a peer in a breakout room – analyze each other’s pages and review/discuss
 - Analyze your own or a Specific Aims page we provide – stay in the main room for a general discussion after the exercise
 - If you want to be paired up with a peer, please use the “rename” function to add the word “pair” to your name. Click on name to see rename option.
- Return to the main room for Closing and Feedback: 5 minutes

How to Rename in Zoom

- If you want to be paired up with a peer, please use the "rename" function to add the word "pair" to your name.
- Click on name to see rename option.



Poll Question:

What is your research role?

Poll Question:

In which stage of the translational research spectrum is your work situated?

Poll Question:

Have you ever written a Specific Aims page for a grant application?

Poll Question:

Did you bring your own Specific Aims page for use in today's hands-on exercise?

Specific Aims: The Most Important Section of the Grant!

- Concise “master plan” for your Research Plan
- Is used by your Scientific Review Officer to choose your reviewers
- Sells the reviewer on your idea
- Is likely that all study section members will read before scoring if they are not chosen reviewers

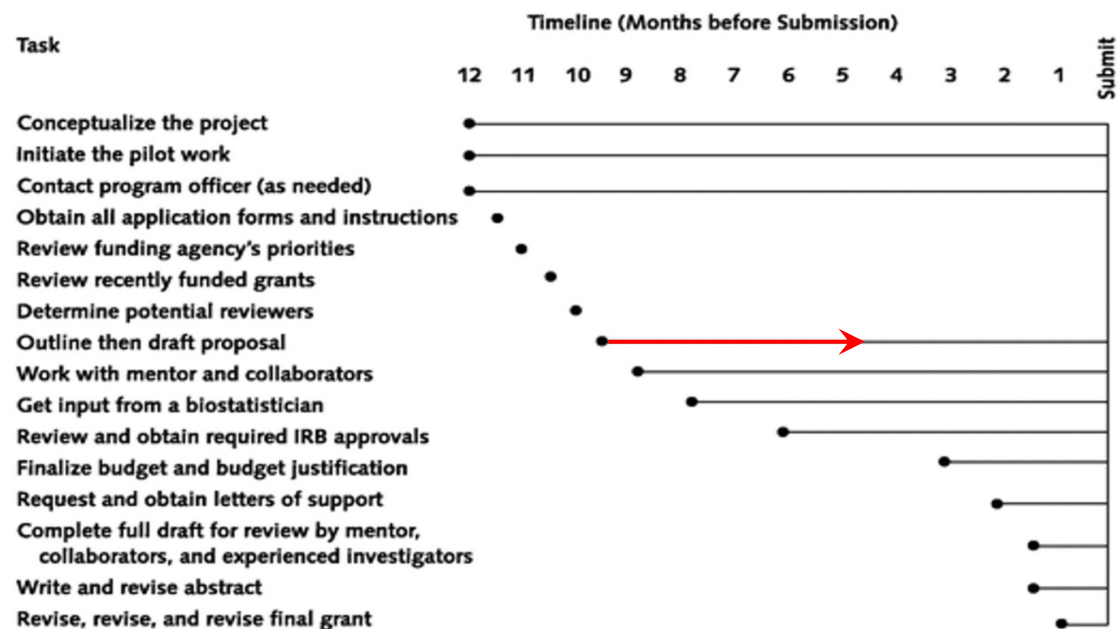
Specific Aims: Reviewer Concerns

Review of 66 R01 applications to a clinical research study section at NIH revealed:

45% of applications received critical comments about the Specific Aims:

- Goals overstated, overly ambitious or unrealistic 18%
- Poorly focused or inadequately conceptualized 15%
- Hypothesis not clearly articulated 12%

Specific Aims: Take Your Time!



Specific Aims: Tips for Success

Draw your readers in – grab their attention!

- Be concise
- Use plain language
- Make the Specific Aims easy to read

Specific Aims: Tips for Success

Take care of your reviewers

- Can review a dozen or more grants in a cycle
- Often less expertise than you in the grant topic

You describing your
research



The reviewer reviewing the
proposal



Specific Aims: Step by Step

Four sections:

- Introduction
- What, why and who
- Specific aims themselves
- Impact

Specific Aims: Introduction

- Hook the reviewer in the first sentence!
 - What is the topic of this research and why is it critically important?
 - How does this research fulfill the mission of the granting agency?
- Present current knowledge about your research topic.
 - Ground the reviewers in the subject of your research.
 - Three to four sentences only. Focus on the key points.
- State the gap/s in knowledge that need to be addressed.
- Describe the critical need that is the driving force for your proposal
 - Assert how the field will be held back without the solution you propose.

Specific Aims: Introduction Example 1

Viruses are thought to be involved in 15% to 20% of human cancers worldwide, thus providing critical tools to reveal common mechanisms involved in human malignancies. As the etiologic agent of adult T cell leukemia/lymphoma (ATLL), human T cell leukemia virus type I (HTLV-1) is just such a virus. HTLV-1 encodes a potent oncoprotein, Tax, which regulates important cellular pathways including gene expression, proliferation, apoptosis, and polarity. Over the years, Tax has proven to be a valuable model system in which to interrogate cellular processes, revealing pathways and mechanisms that play important roles in cellular transformation. Although the Tax oncoprotein has been shown to transform cells in culture and to induce tumors in a variety of transgenic mouse models, the *mechanism by which Tax transforms cells is not well understood*. A large number of Tax mutants have been generated and their biological activities have been thoroughly characterized, primarily in cell culture systems. *Currently, a major obstacle in the field* is that the transforming activity of Tax mutants cannot be compared using available transgenic models due to random transgene integration sites, variable transgene copy number, and inconsistent transgene expression levels, making it difficult to link the biological activities of Tax mutants with their transforming potential.

Color Key: Hook

Known Information

Gap in Knowledge

Critical Need



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Bioscience Writers (2015). NIH Grant Applications: The Anatomy of a Specific Aims Page. Retrieved from <http://www.biosciencewriters.com/NIH-Grant-Applications-The-Anatomy-of-a-Specific-Aims-Page.aspx>

Specific Aims: Introduction Example 2

Patients with chronic kidney disease (CKD) have more co-morbidities, are hospitalized more often and for longer lengths of stay, and incur greater healthcare costs than patients with other chronic conditions. Patients with CKD are less likely to receive evidence-based therapies when hospitalized for serious illness, such as myocardial infarction, and commonly have complex drug regimens and adverse events which contribute to poor outcomes. The current state of knowledge largely concerns risks of CKD associated with discreet episodes of hospitalization. Among survivors, little is known about strategies to improve the transition from hospital-to-home to or how to favorably impact outpatient management, health outcomes, costs, and risks of hospital readmission or death.

Enhanced transitional care interventions have been shown to improve medication information transfer, reduce hospital readmissions, and slow the progression of declining health in the general population of hospitalized patients. What is not known is the impact enhanced transitional care can have for a very high-risk population, such as those with CKD. Hospitalized patients with CKD are in critical need of improved transitional care that includes accurate and comprehensive medication information transfer. Interventions that prevent or slow CKD progression--blood pressure control with angiotensin converting enzyme (ACE) inhibition or angiotensin-2 receptor blockade (ARB) and intensive glycemic control in patients with diabetes--are all highly dependent on meticulous medication management.

Color Key:

Hook

Known Information

Gap in Knowledge

Critical Need



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Aim attributed to Kathy Tuttle, MD, FASN, FACP,
Executive Director for Research, Providence Health Care

Specific Aims: What, Why, and Who

What you want to do

Why you want to do it

What you expect to find

Why you and your team

Make sure to include (in this section or elsewhere in the aims)

- Your high-level central hypothesis
- Your long-term goal, the purpose/objective of your project, and their match with the critical need
- The rationale – what will be possible after this work is complete and the reason you are pursuing this project
- Why your research design and your team are the best to accomplish your goals.

Specific Aims: What, Why and Who Example 1

To solve this problem we will develop an innovative mouse model system in which to study Tax tumorigenesis using targeting vectors containing wild-type or mutant Tax genes that are silenced by a preceding floxed stop cassette. These vectors will be knocked in to the *Rosa26* locus of recipient mice by recombination. After crossing these mice with Lck-CRE mice, the stop cassette will be specifically excised in developing thymocytes where the Lck promoter is active, allowing conditional expression of wild-type or mutant Tax proteins in T cells, the natural target of HTLV-1 infection. The feasibility of our proposed mouse model is supported by the fact that Lck-Tax transgenic mice have been developed and produce a leukemia that closely resembles ATLL. Thus, targeting of Tax expression in cells in which the Lck promoter is active is expected to produce a similar disease in our model. In our improved model system, insertion into the *Rosa26* locus will eliminate random integration sites and standardize gene copy number resulting in consistent levels of wild-type and mutant Tax protein expression.

Key: Long-term Goal Proposal Objective Rationale Hypothesis Pay-off

Specific Aims: What, Why and Who Example 2

Our long-term goal is to improve the overall health, survival, and economics of care for patients with CKD by reducing risk of hospital readmission, complications, and related costs. The main objective of this application is to pilot-test the effectiveness of transitional care strategies to improve clinically relevant outcomes in this high-risk population. Based on our preliminary data, the central hypothesis is that transitional care strategies focused on enhancing the accuracy and comprehensiveness of medication information transfer will lead to improved health outcomes among patients with CKD. The rationale that underlies this proposed research is that meticulous medication management is foundational to controlling CKD risk factors and reducing complications. For hospitalized patients with CKD who are transitioning to home, accurate and comprehensive information transfer is essential to optimal medication management.

Key:	Long-term Goal	Proposal Objective	Rationale	Hypothesis	Pay-off
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Specific Aims: The Aims Themselves

Logical, step-by-step development of key ideas, hypotheses and activities for fulfilling the objective/s to address the critical need.

Each aim should:

- Describe the idea and relate it to your hypothesis
- Include important outcome
- Consider using subtext with measurements and comparisons that tie into the hypothesis

Specific Aims: Tips for Strong Aims

- Be brief, informative, somewhat like a headline. Make sure your grandma can understand them!
- Be conceptual rather than descriptive if possible. Focus on the why rather than the what. Avoid words like “compare,” “correlate,” “describe,” “investigate.”
- Relate the aims to one another and make sure they flow logically into one another, but don’t make them dependent on one another.
- Make sure you include information that illustrates the value and testability of each aim.
- Use headings and/or bullets to delineate each aim.

Specific Aims: The Aims Example 1

Aim 1 will establish an innovative mouse model for HTLV-1 Tax tumorigenesis. Targeting vectors containing silenced wild-type or mutant Tax genes will be knocked in to the Rosa26 locus of C57BL/6 mice. These mice will then be crossed with homozygous Lck-CRE mice, thereby excising the stop cassette and generating mice that express wild-type or mutant Tax proteins specifically in T cells.

Aim 2 will examine the effect of mutations that disable specific biological functions of Tax on Tax-mediated tumorigenesis. Tax can bind to and regulate the activity of members of the SRF, CREB, NF- κ B and PBM protein families, each of which has been implicated in oncogenesis. Mice established in Aim 1 will allow us to compare for the first time the tumorigenic potential of wild-type and mutant Tax proteins in an effort to identify pathways that are required for Tax tumorigenesis.

Color Key: Aim Title Experimental Strategy Outcome or Impact

Specific Aims: The Aims Example 2

To objectively test our central hypothesis we will pursue the following Specific Aims:

1. **Evaluate the impact of transitional care interventions on acute care utilization following hospital discharge among patients with CKD.** Our working hypothesis is that medication discrepancies following hospital discharge are widespread and that their resolution, through improved transfer of medication information during transitional care, will reduce acute care utilization and costs among patients with CKD.
2. **Evaluate the impact of transitional care strategies on management of CKD risk factors and complications.** Our working hypothesis for this aim is that improving accurate medication information transfer during care transitions, including patient and family members' understanding of the rationale for medication use, will contribute to more effective medication management, and thereby improve CKD risk factors and reduce complications.

Color Key: **Aim Title** **Experimental Strategy** **Outcome or Impact**

Specific Aims: Impact

Identify the return on investment (ROI) for your proposal by stating:

- What is innovative/transformative about your proposal,
- The expected outcomes of your aims (if not included in the aims paragraph)
- The broad impact of your research.
 - How will your research products fill the needs that you have identified?
 - How will the outcomes advance your field vertically?
 - How will your research contribute to the mission of the grant agency that you are targeting -- to change current knowledge?

Specific Aims: Impact Example 1

The proposed studies will establish a new mouse model that will overcome current limitations and provide greater insight into the mechanism of HTLV-1 Tax tumorigenesis, knowledge that is currently lacking and that promises to yield novel insights into viral and cellular biology. The new and improved mouse model for Tax tumorigenesis will provide a valuable resource for the wider scientific community to pursue a multitude of studies that have not previously been possible due to limitations of existing mouse models of Tax.

Color Key: Innovation Expected Outcomes Impact/Pay-off

Specific Aims: Impact Example 2

The expected outcomes for this pilot study are to improve post-hospital discharge medication information transfer for patients with CKD resulting in: 1) decreased acute care utilization and costs; and 2) improved management of CKD risk factors and complications.

Collectively, these results will allow us to determine benefits and cost savings of a medication information transfer intervention in transitional care. These results are expected to positively impact care of CKD patients by reducing acute care utilization and costs while improving metrics for risk factors and complications.

Color Key:

Expected Outcomes

Impact/Pay-off

Specific Aims: Common Mistakes

Common Grant Critiques	Solutions
Overly ambitious	Include existing literature and/or preliminary studies to demonstrate that the work you propose is feasible
Methods not feasible	
Fishing expedition	Make sure you present an overarching hypothesis in the What, Why and Who section as well as individual hypotheses for each Aim if possible. Avoid exploring data to identify a hypothesis.
Not hypothesis driven	
Lack of innovation	<p>Make sure your proposal uses:</p> <ul style="list-style-type: none"> • a new theory or model (supported by literature) • A different application of an existing theory or model (e.g., from another field) • an existing theory or model in a new population, system, or circumstance • new and better experimental methods, instrumentation, or analytic approaches

Write, Discuss, Revise, Discuss, Revise.....

"I know some very great writers, writers you love who write beautifully and have made a great deal of money, and not one of them sits down routinely feeling wildly enthusiastic and confident. **Not one of them writes elegant first drafts.**".....Anne Lamott

Additional Resources:

1. Santen RJ, Barrett EJ, Siragy HM, Farhi LS, Fishbein L, Carey RM. The Jewel in the Crown: Specific Aims Section of Investigator-Initiated Grant Proposals. J Endocr Soc. 2017 Aug 17;1(9):1194-1202. doi: 10.1210/js.2017-00318.
2. VA CDA National Cyberseminar: How to Craft a Successful Specific Aims Page:
<https://www.rheumatology.org/Portals/0/Files/Specific%20Aims%20-%20Do's%20and%20Don'ts.pdf>
3. Examples of Specific Aims pages and Grant Applications:
<https://www.niaid.nih.gov/grants-contracts/draft-specific-aims>



Questions?

Exercise: Analyzing a Specific Aims Page

If you are paired with a peer:

You will be placed into a breakout room shortly

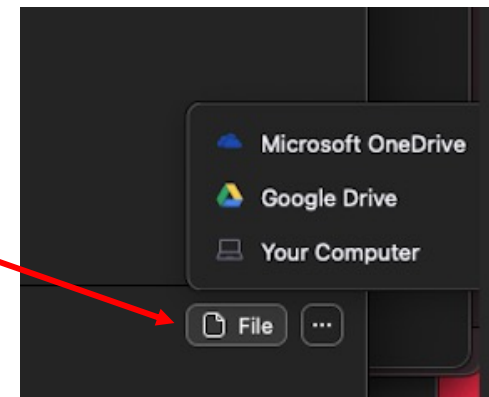
- Exchange your Sp Aims page files with your partner (*details on next slide*)
- Analyze each other's Sp Aims page – 10 mins
- Provide feedback to each other – 10 mins
- Rejoin the main room when you are ready

If you are analyzing your own or a provided Sp Aims page:

You will stay in the main room

How to Share Files via Zoom

1. Identify the location of your Sp Aims file on your device
2. In your breakout room, click the “Chat” button
3. At the bottom of the chat area there is a **file icon** (see image for reference)
4. Click the “File” icon
5. Select “Your Computer”
6. Locate and select your Sp Aims file on your device to share it
7. Once file is transferred, open the document for review
8. If your device doesn’t allow for this, exchange files via email



Exercise: Dissecting a Specific Aims Page

Introduction: Hook, Known Information, Gap in Knowledge, Critical Need

What, Why, and Who: Long-term Goal, Objective, Rationale, Hypothesis, Pay-off

Specific Aims: Aim Title, Strategy, Outcome

Impact: Innovation, Expected Outcomes, Impact

Thank You!



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Feedback Survey

A link to the feedback survey has been sent to the email address you used to register.

Please get out your device, find that email, and spend a few moments completing that survey before you leave today.

Tip: If on a mobile device, shift view to landscape view (sideways) for better user experience.