



Communicating your Research Plan:

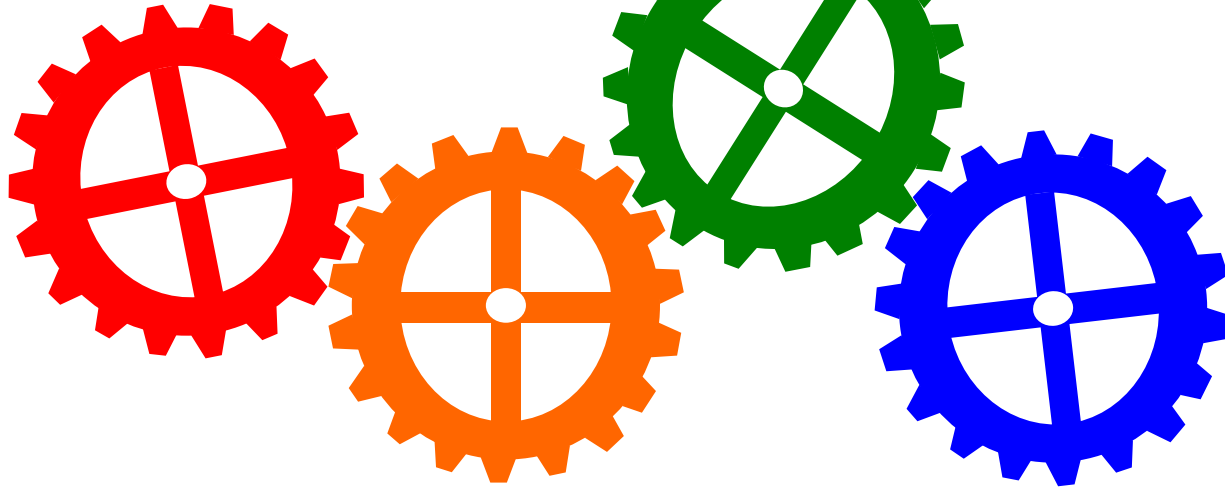
Building a narrative that describes a set of goals
and how you will reach them

Sky Brubaker, PhD

The bulk of a Research Plan consists of the overall goal and what will be done

**Is the question
important?**

**What specifically
will be done?**

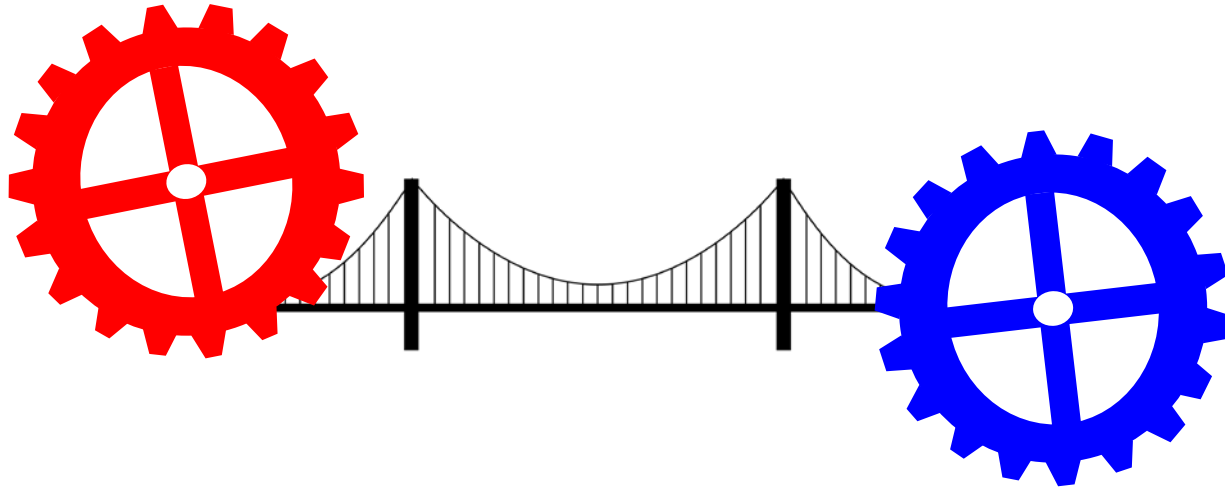


**What is the
overall goal?**

**What is the
expected payoff?**

The Research Plan will “bridge” the gap between the need and the payoff.

**Is the question
important?**



**What is the
expected payoff?**



Key Questions for your Research Plan

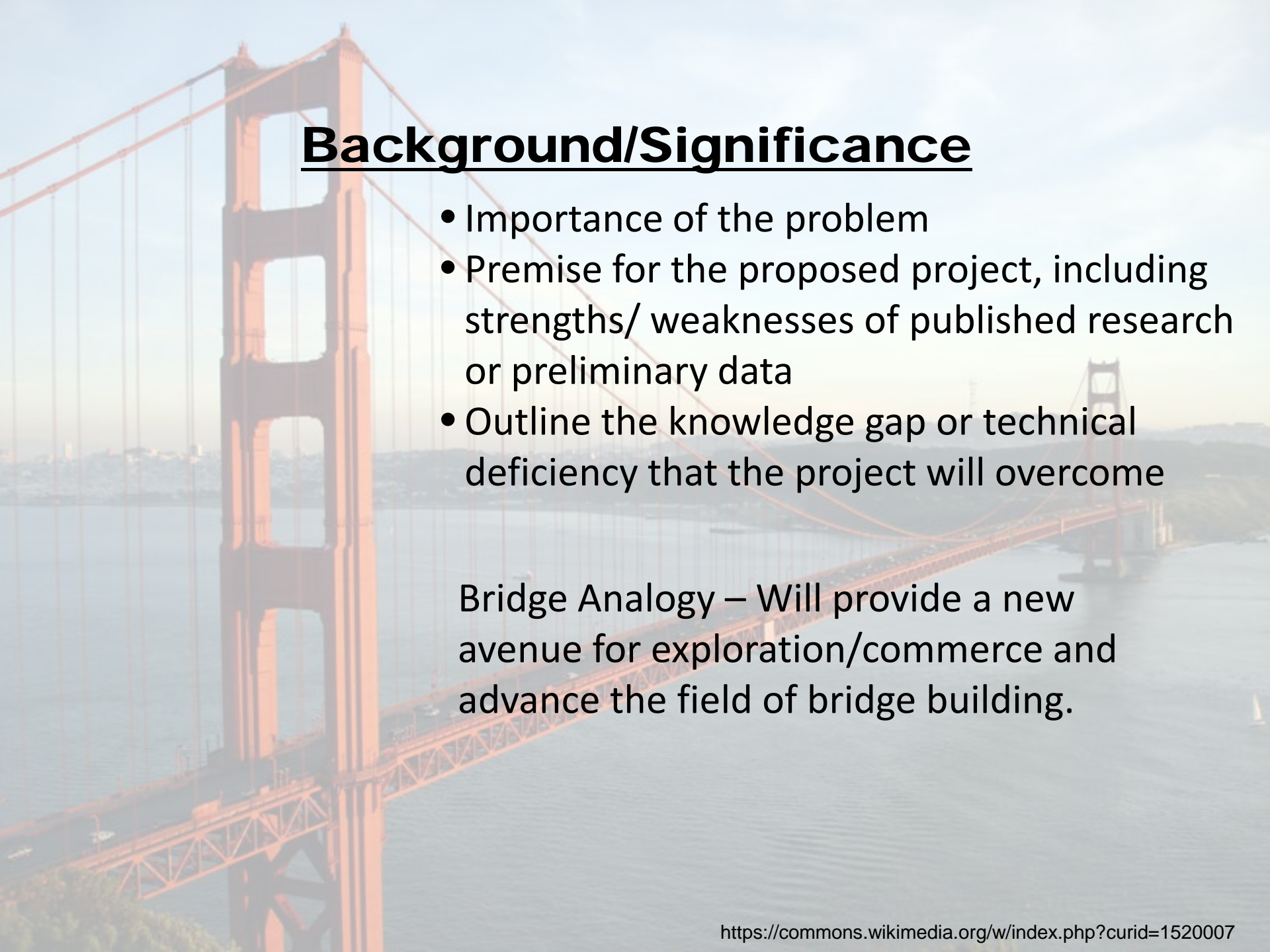
1. Is there a need?
2. How will the project be accomplished?
 - What methods and analyses will be used?
 - What are the expected outcomes?
 - What might go wrong and how will it be managed?
 - What are the alternative approaches?

Key Questions for your Research Plan

1. Is there a need?
2. How will the project be accomplished?
3. How long will the project take?
4. What is the payoff and what is next?

An Outline for your Research Plan

1. Background/Significance
2. Aims
3. Timeline
4. Conclusion and Future Directions

A background image of the Golden Gate Bridge in San Francisco, showing its iconic orange-red towers and suspension cables over the water. The bridge is slightly out of focus, serving as a backdrop for the text.

Background/Significance

- Importance of the problem
- Premise for the proposed project, including strengths/ weaknesses of published research or preliminary data
- Outline the knowledge gap or technical deficiency that the project will overcome

Bridge Analogy – Will provide a new avenue for exploration/commerce and advance the field of bridge building.

A background image of the Golden Gate Bridge in San Francisco, viewed from a low angle looking up at the tower and across the water.

*note concerning innovation

Innovation

- approaches
- methodology

Describe how your proposal improves upon previous research or technology.

Bridge Analogy – Developing new material for bridge building that will revolutionize the way that we build bridges.

An Outline for your Research Plan

1. Background/Significance
2. Aims
3. Timeline
4. Conclusion and Future Directions

The background of the slide is a photograph of the Golden Gate Bridge in San Francisco. The bridge's iconic orange-red towers and suspension cables are visible against a hazy, blue sky. The bridge spans across a body of water, with the city skyline and hills visible in the distance.

Aims

- A hypothesis
- Specific aims and objectives used to examine the hypothesis
- Description of methods/ approaches/ techniques to be used
- Discussion of possible problems and how they will be managed
- Alternative approaches that might be tried

-NIH Application Form Instructions

A background image of the Golden Gate Bridge in San Francisco, viewed from a low angle looking up at the tower and across the water. The bridge's orange-red structure is prominent against a hazy sky and water.

Organizing each Aim

- Introduction
- Preliminary Data
- Methods
- Expected Outcomes
- Alternative Approaches

A background image of the Golden Gate Bridge in San Francisco, showing the iconic orange-red suspension towers and cables stretching across the water. The sky is a pale blue with soft, wispy clouds. The bridge's structure is prominent on the left, with the deck extending towards the right.

Introduction

Provide an overview of the aim, including:
specific objective, working hypothesis,
rationale, and expected outcomes

A background image of the Golden Gate Bridge in San Francisco, showing the iconic orange-red suspension bridge structure over the water, with hills visible in the distance under a clear sky.

Preliminary Data

Critical review of the relevant literature

Preliminary studies

- establish feasibility of project
- clear and able to stand alone

Lead reviewer to conclude that you and the project are capable of success

Bridge Analogy – Our new material has been tested for strength demonstrating that it will be suitable for our proposed bridge.

A background image of the Golden Gate Bridge in San Francisco, showing its iconic orange-red towers and suspension cables over the water. The image is slightly faded to allow text to be read clearly.

Methods

Provide a detailed description of the experimental design including:

- validation of essential reagents/approaches
- description of controls and their significance
- statistical analysis and interpretation

Bridge Analogy – Our proposed material will be regularly tested throughout construction we **expect** that it's strength capacity will be validated.

A background image of the Golden Gate Bridge in San Francisco, showing the iconic orange-red suspension towers and cables stretching across the water under a clear sky.

Expected Outcomes

Summarize expected experimental outcomes and provide an interpretation of the data.

What is the immediate payoff? Does this address the knowledge gap you wish to bridge?

Bridge Analogy – (on data collected during construction)...These results will confirm that our material meets current standards and justify continued work.

A background image of the Golden Gate Bridge in San Francisco, showing the iconic orange-red suspension bridge structure over the water, with hills and city buildings visible in the distance under a clear sky.

Alternative Approaches

Introduce Alternative Approaches by highlighting potential problems

Bridge Analogy – If the strength of the new material is in question, it would only be used for certain portions of the bridge.

An Outline for your Research Plan

1. Background/Significance
2. Aims
3. Timeline
4. Conclusion and Future Directions

Timeline

Demonstrates feasibility

Bridge Analogy – Year 1 – support structure complete, Year 2 – surface structures complete.

Timeline

Demonstrates feasibility

Fellowship Start Date ↓					
Aim 1	complete HTS chemical screen	validate hits in vitro			
		KO/overexpress target	validate target KO in vitro		
			test hits in vivo (DSS-induced colitis)		
Aim 2	complete genome- wide KO screen	generate single KOs			
		validate single KOs	epistasis analysis		
		acquire KO mice	characterize colitis in KO mice		
		Year 1	Year 2	Year 3	Beyond

A background image of the Golden Gate Bridge in San Francisco, showing its iconic orange-red towers and suspension cables over the water.

Conclusion and Future Directions

- Summarize expected outcomes, how they will bridge a current knowledge gap, and how the proposed project will lead to progress in the field
- Discuss future experiments or approaches

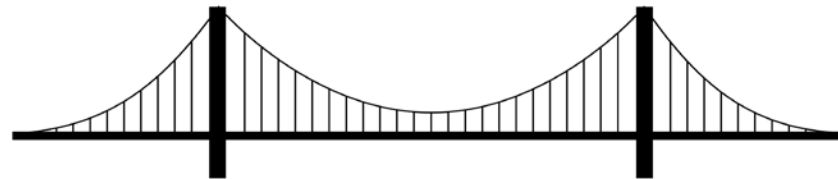
Bridge Analogy – A critical barrier was eliminated, we can now explore Marin! Also with the advent of our new bridge technology we can build a bridge to Hawaii!!!

An Outline for your Research Plan

1. Background/Significance
2. Aims
3. Timeline
4. Conclusion and Future Directions

The Research Plan “bridges the gap” between need and expected payoff

Is there a need?



What is the payoff
and what is next?

How will the project be accomplished?
How long will the project take?

Resources for building your Research Plan

Hollenbach, Andrew. *A Practical Guide to Writing a Ruth L. Kirschstein NRSA Grant*. Amsterdam: Academic Press, 2014. [ISBN 978-0-12-420187-3]

Russell, Stephen W. and David C. Morrison. *The Grant Application Writer's Workbook: National Institutes of Health Version*. Los Olivos, CA: Grant Writers' Seminars and Workshops, LLC, 2016. <www.grantcentral.com>

Yang, Otto O. *Guide to Effective Grant Writing: How to Write an Effective NIH Grant Application*. New York: Springer US, 2012. [eBook ISBN 978-1-4614-1581-7]

Sample NIH applications and summary statements are available here:
<https://www.niaid.nih.gov/grants-contracts/sample-applications>