



CAIRIBU TRAINEE SUMMER CAMP

Developed by the CAIRIBU Urobiome RIG

Goals: Define specific aims and identify common weaknesses. Write a specific aim for a grant proposal.

EXECUTIVE SUMMARY 07/17/2026 CAIRIBU Trainee Summer Camp



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- [Access this workshop's slides and practice aims](#)

In this summer camp, Dr. Hale led an exercise in the “art of the aim”

What is a specific aim and what is it used for?

- Specific aims are necessary for grants, fellowship applications, candidacy exams / proposals, and clarifying our own scientific logic and experimental plan
- A specific aim is a question that will be answered by a defined set of experiments
- Each aim should be one biological question
- A specific aim is NOT a task, method, to-do list, or milestone

Guidelines for NIH aims

- Aims should be important and testable, and the proposed experiments should be able to actually answer the question
- Every NIH aim should answer: “If I complete this aim successfully, what will I know that I don't know today?”

Parts of a scientific proposal: the context for an aim

- Project goal: Long term vision
- Hypothesis: WHY do you think this is true?
- Specific aim: What question will you answer?
- Experiment (approach): How will you answer the question?
- Expected outcome: What will I know if the aim succeeds?
- Impact: Why should the NIH care? (how will findings advance the field, improve future studies, or benefit health?)

Common pitfalls in writing aims

- Too broad (“*study urinary tract infections*”)
- Does not answer a scientific question – the why (“*perform RNA-seq on bladder tissue after UTI*”)
- Scope is too large (“*investigate all host-pathogen interactions during urinary tract infection*”)
- Too ambitious, tackling too many areas without being specific to one aim (“*determine whether antibiotics alter the gut microbiome, urinary microbiome, immune response, epithelial repair, bacterial persistence, and recurrence*”)
- Not specific enough (“*determine the role of inflammation in recurrent urinary tract infections*”)
- Experimental approach not suited to testing hypothesis – e.g., using the wrong tool or doing an experiment that will not address the hypothesis
- Conflating correlation with causation
- Disconnect in scientific logic between aim and approach
- Overlooking additional mechanisms that could explain your hypothesis

Vanessa Hale DVM, PhD, MAT is Associate Professor in the Department of Preventative Veterinary Medicine at Ohio State University. She is Co-Director of the Microbial Communities Program within OSU's Infectious Diseases Institute and Associate Director of the Center of Microbiome Science. Her research focuses on host, microbiome, and environment interactions related to health and disease. Using 16S rRNA microbiome data along with metabolomics, metagenomics, transcriptomics, culture, and gnotobiotic mouse work, she evaluates how microbial communities respond to host factors such as diet or contribute to pathogen susceptibility and cancer development.