



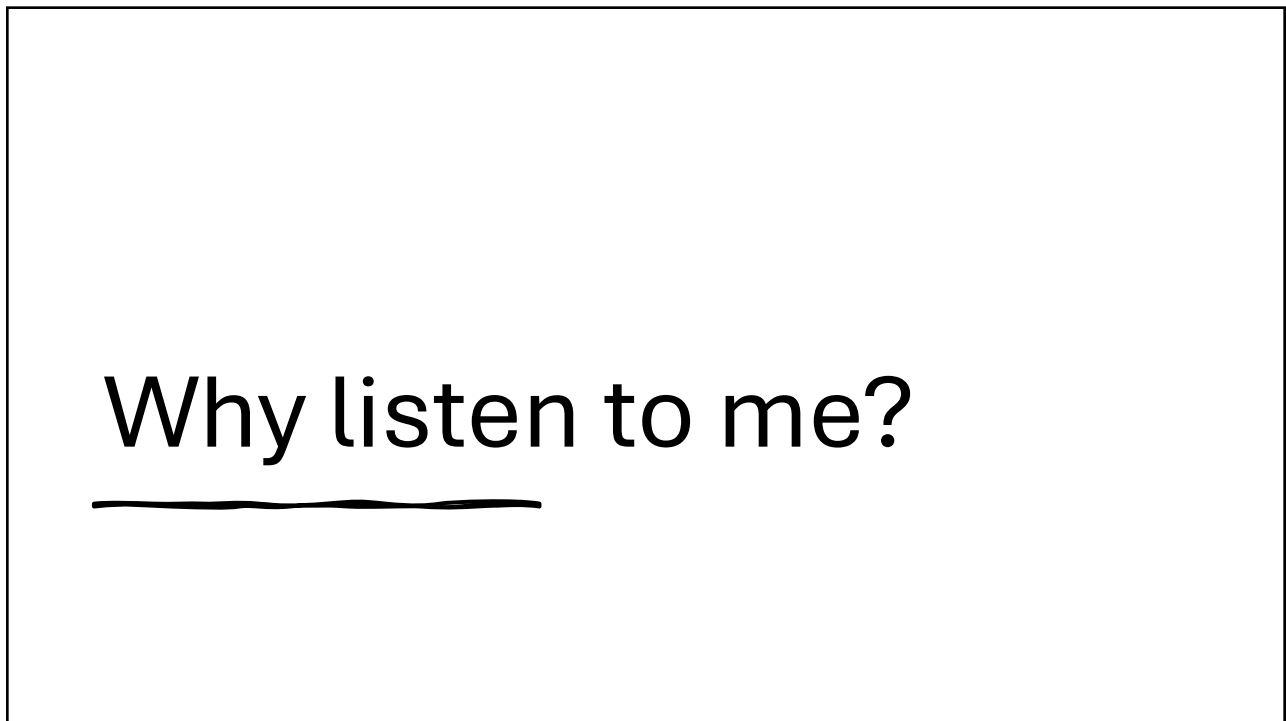
**GRANTSMANSHIP:**  
Convincing people to give you money!

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How to apply for research funding from the ACVD/AAVD  
And other places

fadokv@gmail.com

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**Why listen to me?**

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2

# GO BIG OR GO HOME!

Write your grant proposal as if your life (or your career) depends on it.

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## Review what Dr Mueller said

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- What can you accomplish in 10–12 months?
- How much support can your institution/practice give you?
- What burning questions do you have?
- Would a retrospective study better suit your resources, your time, your interests?
  - Is there is a question about a clinical situation that has not been addressed?
    - What is the real world experience with oclacitinib in ischaemic dermatopathies?
    - What is the level of client acceptance of a diet trial for food allergy?
      - Dermatology practice vs general practice

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## What does it take to write an effective grant?

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- An idea – unmet needs--*What excites your passion?*
- **Good research doesn't have to be expensive!**
- Hypothesis
- Specific aims
- Introduction
- Preliminary data-why do I need this?
- Methodology
- Statistical
- Budget
- References

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## Types of hypotheses

<https://paperpal.com/blog/academic-writing-guides/how-to-write-a-hypothesis-types-and-examples>

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- The seven types of hypotheses are listed below:<sup>5,6,7</sup>
- 1. Simple:** Predicts the relationship between a single dependent variable and a single independent variable.
  - Example: *Exercising in the morning every day will increase your productivity.*
- 2. Complex:** Predicts the relationship between two or more variables.
  - Example: *Spending three hours or more on social media daily will negatively affect children's mental health and productivity, more than that of adults.*
- 3. Directional:** Specifies the expected direction to be followed and uses terms like increase, decrease, positive, negative, more, or less.
  - Example: *The inclusion of intervention X decreases infant mortality compared to the original treatment.*
- 4. Non-directional:** Does not predict the exact direction, nature, or magnitude of the relationship between two variables but rather states the existence of a relationship. This hypothesis may be used when there is no underlying theory or if findings contradict prior research.
  - Example: *Cats and dogs differ in the amount of affection they express.*

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## Types of hypotheses

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**5. Associative and causal:** An associative hypothesis suggests an interdependency between variables, that is, how a change in one variable changes the other.

- Example: *There is a positive association between physical activity levels and overall health.*
- A causal hypothesis, on the other hand, expresses a cause-and-effect association between variables.
- Example: *Long-term alcohol use causes liver damage.*

**6. Null:** Claims that the original hypothesis is false by showing that there is no relationship between the variables.

- Example: *Sleep duration does not have any effect on productivity.*

**7. Alternative:** States the opposite of the null hypothesis, that is, a relationship exists between two variables.

- Example: *Sleep duration affects productivity.*

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## Characteristics of a hypothesis

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- **Testable:** You must be able to test the hypothesis using scientific methods to either accept or reject the prediction.
- **Falsifiable:** It should be possible to collect data that reject rather than support the hypothesis.
- **Logical:** Hypotheses shouldn't be a random guess but rather should be based on previous theories, observations, prior research, and logical reasoning.
- **Positive:** The hypothesis statement about the existence of an association should be positive, that is, it should not suggest that an association does not exist. Therefore, the language used and knowing how to phrase a hypothesis is very important.
- **Clear and accurate:** The language used should be easily comprehensible and use correct terminology.
- **Relevant:** The hypothesis should be relevant and specific to the research question.
- **Structure:** Should include all the elements that make a good hypothesis: variables, relationship, and outcome.

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# 5 RULES FOR A GOOD HYPOTHESIS

A hypothesis is your best guess at what will happen.

It might be wrong, but we will learn from it.

It must be specific

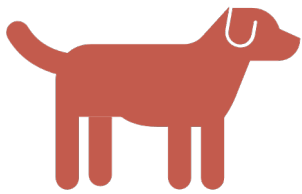
It must be measurable

It should be repeatable

The 3 words:

- If . . .
- Then . . .
- Because . . .

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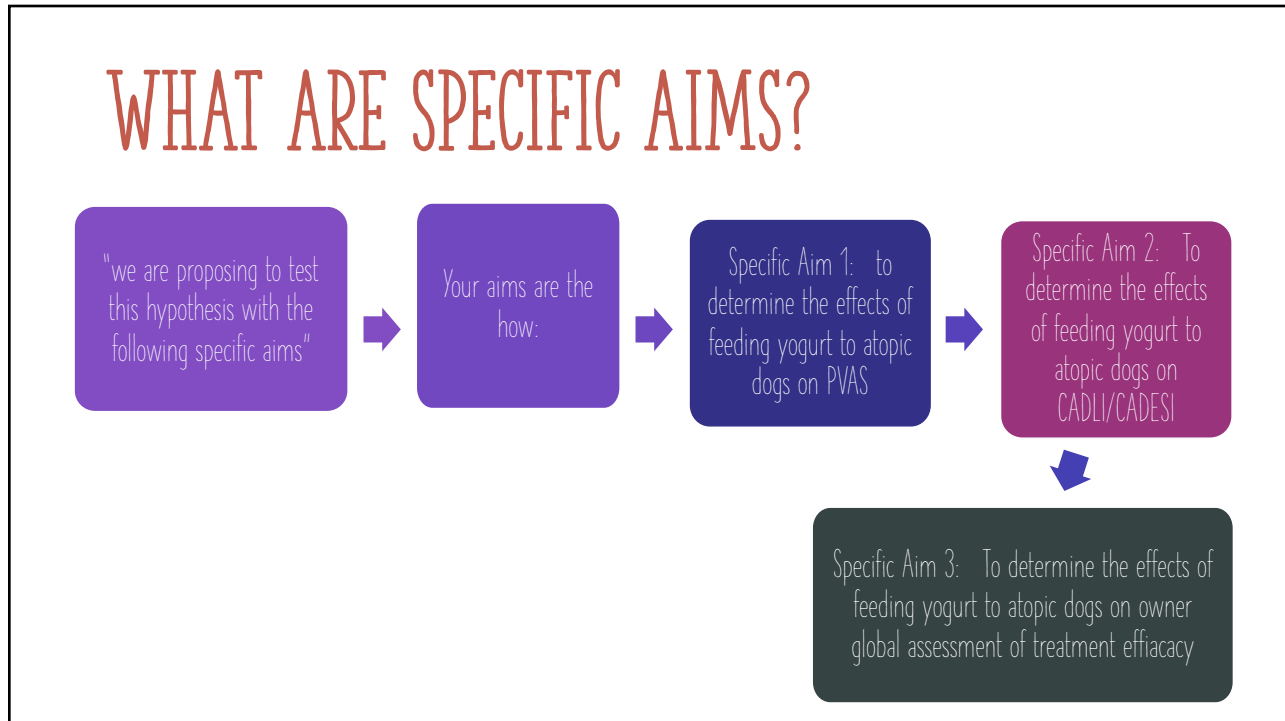


IF I FEED YOGURT TO ATOPIC DOGS FOR 60 DAYS,  
THEN THEIR CADESI/CADLI SCORES WILL BE  
REDUCED, BECAUSE THE PROBIOTICS WITHIN THE  
YOGURT WILL MODULATE THE INFLAMMATORY  
RESPONSE.

VS

I WILL FEED YOGURT TO ATOPIC DOGS TO SEE IF IT  
REDUCES INFLAMMATION.

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If you want to publish in a credible paper for canine atopic dermatitis you should use this paper to guide your proposal and your publication

Olivy et al. BMC Veterinary Research (2018) 14:238  
<https://doi.org/10.1186/s12917-018-1569-y>

BMC Veterinary Research

**GUIDELINES** Open Access

**Development of a core outcome set for therapeutic clinical trials enrolling dogs with atopic dermatitis (COSCAD'18)**

Thierry Olivy<sup>1,2\*</sup>, Emmanuel Besignor<sup>3,4,5</sup>, Claude Favrot<sup>6</sup>, Craig E. Griffin<sup>7</sup>, Peter B. Hill<sup>8</sup>, Ralf S. Mueller<sup>9</sup>, Jon D. Plant<sup>10</sup>, and Hywel C. Williams<sup>11</sup> for the International Committee of Allergic Diseases of Animals (ICADA)

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# Specifics for AAVD/ACVD proposals

## <https://acvd.org/research-grants/>

• **PUH-LEESE! Visit this site, read the instructions, and check out the example grant**

### Guidelines for Proposal Preparation:

Proposals for the research grant offered by the ACVD/AAVD should be prepared according to the guidelines listed below. Applications not adhering to these guidelines may be excluded from consideration.

### Cover Page

1. Submitting organization
2. Title of the proposed research
3. Total amount requested
4. Proposed duration
5. Desired starting date
6. Principal investigator
7. Department
8. Phone number
9. If the grant is awarded to you, acknowledge a procedure is in place to receive funds at your employed institution or practice and state whom the check is to be made payable if the application is successful.
10. Where to send the check, and any required identification needed on the check
11. Details of where to send the award notice
12. The font should be Arial, 11 point for the text and 12 point for the title. The maximum word count for the proposal is 4000 excluding title page, budget and references

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### **Abstract**

Provide a brief abstract (no more than 250 words) with clearly stated objectives and the importance of the research, the experimental design, subjects used and the methods used for achieving the stated objectives.

**POLISH THIS**

### **Introduction**

This should briefly review the subject and highlight any deficiencies in knowledge which this research proposal aims to address. Supporting data from existing publications should be given and referenced. A complete literature review is not required and the discussion should be targeted around the proposed research.

### **Specific aims/ hypothesis**

This should be clearly stated and be supported by the materials and methods described

### **Preliminary data**

Credit will be given for preliminary data supporting the study. Candidates should also provide evidence that adequate resources/ facilities/ expertise/ case material is available to facilitate completion of the study.

### **Materials and methods**

This section should describe the study in enough detail that the committee understands how the project will be carried out. Justification should be given for the number of participants/ samples involved. There should be clear consideration of any problems/ drop outs that may be encountered during the study period and how these might be dealt with. Feasibility at the location and in the time -frame proposed should also be justified.

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**Data analysis**

The proposed method of statistical analysis should be detailed.

**Ethical consideration**

If the study involves animals, ethical approval for the study must be given. If the IACUC application has been made and is still under consideration this should be made clear. Funding will not be awarded without confirmed ethical approval. If client owned animals are involved then a consent form should also be provided

**Budget**

This should be given in enough detail for the committee to understand how the money is to be spent. ACVD/AAVD will also provide funds for some of the costs for examination fees and technician support. Technician support should constitute no more than 20% of the total monies requested. Documentation of technician's salary and benefits must be included. Up to 8% of University overhead may also be covered. Travel and conference attendance will not be covered.

**References**

A list of references should be given and formatted in the Vancouver style

**Curriculum vitae and institution**

Please limit institutional and identifying information to the title page only. To the extent possible, the proposals will be evaluated anonymously. Submitted along with the body of the proposal, as a separate document, should be one copy of the curriculum vitae of each of the principal investigators.

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# WORKING FOR CHANGE

If and when this happens, then you will want bio sketches for all involved

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## Introduction-What do you really need?

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- Complete discussion of WHAT YOU WILL STUDY
  - *You MUST have any papers that refer to your topic*
  - *Not an exhaustive review of the whole topic*
- Assume that your audience knows nothing
- Clarity and brevity are essential
- Spelling and grammar
- If English is not your first language, get a native English speaker to review and help

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## Materials and methods

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- IACUC approval
  - Institutional Animal Care and Use Committee
- Ethic committee approval
- Informed consent

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# Materials and methods

- Thorough
- Referenced
- Understand the methodology
- Example:
  - *If you are planning to measure cytokines by ELISA, state the kit you will use and how it has been validated for use in dogs (use a publication). Then, briefly . . .*

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The screenshot shows the product page for Canine IL-4 DuoSet ELISA (Catalog # DY754) on the R&D Systems website. The page includes a navigation bar with logos for biotechne, R&D SYSTEMS, NOVUS BIOLOGICALS, TOCRIS, protein sample, bioassay, and CLINIQA. A search bar is present. The main content area features a graph of Optical Density vs. Canine IL-4 Concentration (pg/mL), a table of ancillary products, and various navigation tabs like Product Details, Citations (9), FAQs, and Supplemental Products.

Catalog #	Availability	Size / Price	Qty
DY754	In Stock	1 Kit (for 15 Plates) / \$790	0
<b>Ancillary Products Available</b>			
DY008B: DuoSet ELISA Ancillary Reagent Kit		\$340	0
DY999B: Substrate Reagent Pack		\$310	0
DY999: Substrate Reagent Pack		\$310	0

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### Product Features

- Optimized capture and detection antibody pairings with recommended concentrations save lengthy development time
- Development protocols are provided to guide further assay optimization
- Assay can be customized to your specific needs
- Economical alternative to complete kits

### Kit Content

- Capture Antibody
- Detection Antibody
- Recombinant Standard
- Streptavidin conjugated to horseradish-peroxidase (Streptavidin-HRP)

### Other Reagents Required

**PBS:** (Catalog # [DY006](#)), or 137 mM NaCl, 2.7 mM KCl, 8.1 mM Na<sub>2</sub>HPO<sub>4</sub>, 1.5 mM KH<sub>2</sub>PO<sub>4</sub>, pH 7.2 - 7.4, 0.2 µm filtered

**Wash Buffer:** (Catalog # [WA126](#)), or equivalent

**Reagent Diluent\***

**Blocking Buffer\***

**Substrate Solution:** 1:1 mixture of Color Reagent A (H<sub>2</sub>O<sub>2</sub>) and Color Reagent B (Tetramethylbenzidine) (Catalog # [DY999](#))

**Stop Solution:** 2 N H<sub>2</sub>SO<sub>4</sub> (Catalog # [DY994](#))

**Microplates:** R&D Systems (Catalog # [DY990](#)), or equivalent

**Plate Sealers:** ELISA Plate Sealers (Catalog # [DY992](#)), or equivalent

\*For the Reagent Diluent and Blocking Buffer recommended for a specific DuoSet ELISA Development Kit, please see the product .

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#### AI Overview

[Learn more](#)

The Canine IL-4 DuoSet ELISA from R&D Systems requires **100 µL** of sample. The assay is a solid phase sandwich ELISA that uses a 96-well strip plate. [^](#)

**R&D** R&D Systems  
**Canine IL-4 DuoSet ELISA DY754**  
 - R&D Systems  
 Canine IL-4 DuoSet ELISA Summary.  
 Assay Type. Solid Phase Sandwich...

R&D Systems also offers other canine IL-4 products, including: [v](#)

#### Recombinant Canine IL-4 Protein 754-CL-025

This protein is lyophilized from a solution filtered through a 0.2 µm filter. It should be reconstituted at 100 µg/mL in sterile PBS with at least 0.1% human or bovine serum albumin. [v](#)

#### Canine IL-4 Antibody MAB754

This antibody is measured by its ability to neutralize IL-4-induced proliferation in the TF-1 human erythroleukemic cell line. [v](#)

The reference value for serum IL-4 levels is 0.1 to 2.8 pg/L. [v](#)

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## Materials and methods

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- Thorough
- Referenced
- Understand the methodology
- Example:
  - *If you are planning to measure cytokines by ELISA, state the kit you will use and how it has been validated for use in dogs (use a publication). Then, briefly . . .* 100 ul serum from blood drawn from patients and controls will be added to 96 well plates in triplicate (how many replicates do you want) and the ELISA run as directed by the protocol. Plates will be read in X, and data imported into X. Mean and standard deviation of the replicates will be determined by x.

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## Materials and methods-

### The Mueller yogurt experiment

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- How many patients will you need?
  - *Get your power analysis*
  - *increase the minimum number by at least 50% to account for drop out.*
- How will you pick your patients? Any atopic will be fed yogurt? One specific breed?
- How will you randomize?
- What will be your control?
- What brand of yogurt? How will you dose?
  - *What probiotic species are present? Are they quantified? Are they standardized?*
  - *Would you be better off with a probiotic supplement?*

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## Inclusion/exclusion criteria

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- Any dog with the disease of interest?
- Specific breed?
  
- If atopic dermatitis, what level of PVAS, CADESI/CADLI for inclusion.
- What ectoparasite control?
- What infection control?
- What about diet?
  
- 
- What drugs allowed? Disallowed? What are the withdrawal times?
- 
- What about rescue medication?

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## Materials and methods-

### Translational

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- So let's say you want to do some transcriptomics on your yogurt dogs?
- Be very sure you understand the technology, the sample collection, and what the data actually tell you.--**Know the pitfalls!**
  
- If at all possible, run the experiments yourself!

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## Preliminary data is essential (in my opinion)

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- With anonymous review, we have no idea if you or your institute/practice can do what you say you want to do
- You need data to show you have the capabilities and the support

Provide  
More  
Than  
The  
Minimum!

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## How do I develop preliminary data?

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- If your institute/practice has a residency program, they should supply the funds you need to develop preliminary data (IMO)
- Retrospective study
  - *Statistical consult*
  - *Pilot search of your records*
- Prospective study
  - *Statistical consult*
  - *Pilot study of X affected patients*-Take 10 patients and see what the impact of feeding yogurt is on CADESI/CADLI after 30 days. This is your open pilot study OR pull some patients from your records that seem to have responded to yogurt if the dosing was standardized.

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# STATISTICS

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- Statistical significance NOT EQUAL to biologic relevance
- Lies, damned lies, and statistics. Attributed to Benjamin Disraeli by Mark Twain

**Trends in Pharmacological Sciences** 

Volume 8, Issue 7, July 1987, Pages 252-253

**Statistics and pharmacology: the bloody obvious test**

I. Kitchen

Show more ▾

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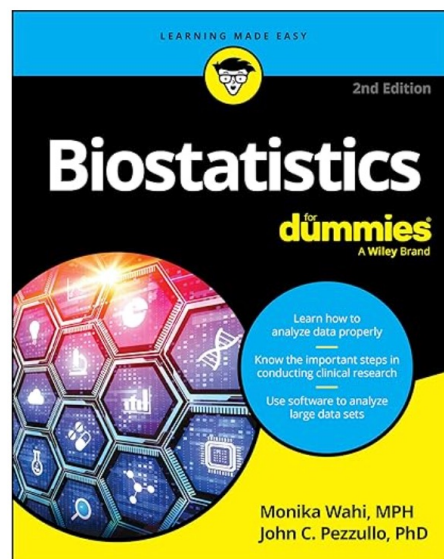
[https://doi.org/10.1016/0165-6147\(87\)90195-7](https://doi.org/10.1016/0165-6147(87)90195-7) [Get rights and content](#)

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# STATISTICS

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- When you want to develop the proposal
  - *Costs paid by your institute/practice*
- When you go to analyze your data
  - *Costs included in your grant budget*



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## Have a summary page about expected outcomes

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- Have a summary page about expected outcomes.
- How will you deal with patients who drop out of the study?
- How will you handle adverse events?

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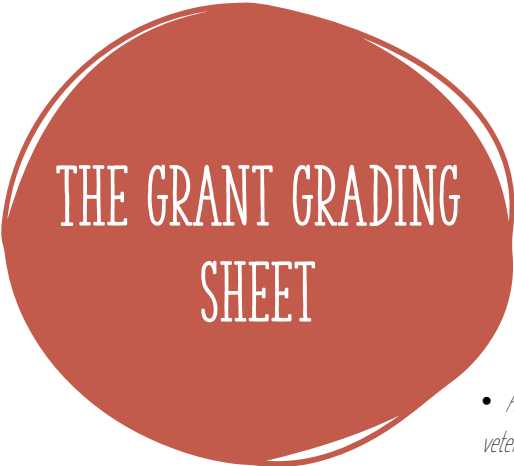
## The budget

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- Comprehensive
- Detail
- Realistic
- Don't pad it!
  - *My bias: your grant should not be paying for exam fees. That is the price of running a good residency program.*
  - *Spend your grant money on what counts!*

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	<b>GRANT TITLE</b>
	<b>RESIDENT PRE-REVIEW</b>
	<b>RESIDENT GRANT</b>
	<b>ACVD BASIC SCIENCE</b>
	<b>ACVD CLINICAL</b>

- Applicants will be expected to propose a project of scientific merit that is applicable to veterinary dermatology. The proposal should describe the feasibility of completing the project within one year of the award and within the proposed budget
- Please note that the group is now in a position to support up to 8% of University overhead and some of the costs associated with examination fees and technician support.

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<p><b>Introduction (15)</b> Has the candidate introduced the subject and adequately reviewed the current literature</p> <p><b>Preliminary data (15)</b> Is preliminary data given. Is this supportive of the study and are adequate resources/ facilities/ expertise available?</p> <p><b>Hypothesis (10)</b> Is the hypothesis reasonable?</p> <p><b>Materials and methods (25)</b> Is the study design well thought out? Has reasonable consideration been given to any problems/ drop outs that may be encountered Is the project feasible at the location/in the time frame proposed? Are there any ethical considerations?</p> <p><b>Data analysis (15)</b> How might the data potentially be analysed statistically and by what method</p> <p><b>Budget (20)</b> This should be justified</p> <p>Score for project x/100</p>
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	Total marks	Actual marks	comments
Introduction	15		
Preliminary data	15		
hypothesis	10		
Materials & methods	25		
Data analysis	15		
budget	20		
Total	100		

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Please comment on the following:

How useful is this study to veterinary medicine (5)  
To Veterinary Dermatology (5)

Additional comments

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## Online resources

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- <https://scientific-publishing.webshop.elsevier.com/manuscript-preparation/what-how-write-good-hypothesis-research/>
- <https://paperpal.com/blog/academic-writing-guides/how-to-write-a-hypothesis-types-and-examples>
- <https://www.usertesting.com/blog/good-research-hypothesis>
- <https://www.pandadoc.com/blog/grant-proposal/>
- <https://writing.wisc.edu/handbook/grants/>

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## Grant Writing 101

Jason T. Wiseman, MD<sup>1</sup> Karim Alavi, MD, MPH<sup>2</sup> Robert J. Milner, PhD<sup>3</sup>

<sup>1</sup> Division of General Surgery, Department of Surgery, University of Massachusetts Medical School, Worcester, Massachusetts

<sup>2</sup> Division of Colon and Rectal Surgery, Department of Surgery, University of Massachusetts Medical School, Worcester, Massachusetts

<sup>3</sup> Department of Neurology, University of Massachusetts Medical School, Worcester, Massachusetts

**Address for correspondence** Karim Alavi, MD, MPH, Division of Colon and Rectal Surgery, Department of Surgery, University of Massachusetts Medical School, 67 Belmont Street, Worcester, MA 01605 (e-mail: karim.alavi@umassmemorial.org).

Clin Colon Rectal Surg 2013;26:228-231.

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