

**PRELIMINARY**

# Data for basic science

a prelim look in 10 minutes or less

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# Why have preliminary data

- Proof of research principle
  - Show that your work matters
- Proof of laboratory capability
  - Show that you are the right person to do the work
- Impress the reviewers

# Why have preliminary data

- 10 most common mistakes of grant writing:
  - Proposal lacks significance
  - No testable hypothesis
  - Weak or absent preliminary data
  - Overambitious aims
  - Aims dependent on previous aims
  - Overly complex methodology
  - Absent statistical justification
  - Lacks innovation
  - Investigator lacks experience or collaboration
  - Didn't follow the guidelines

# Why have preliminary data

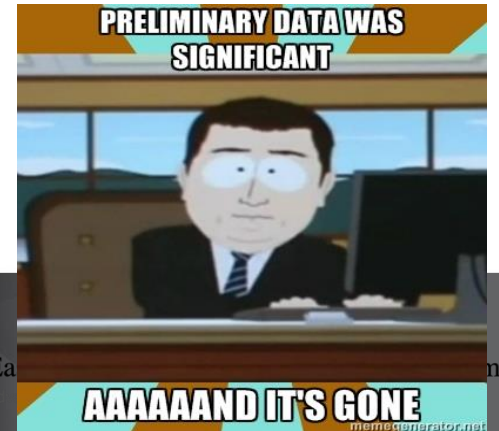
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# Which grants need prelim data

- R01, K08 or other investigator initiated grants
- Fellowship, cooperative agreement, program projects
- Small (R03) and Exploratory/developmental (R21) do not require prelim data
  - But many successful applicants do include prelim data
  - If you have it, include it
- Know the rules of the grant application
  - Look at the instructions before you write

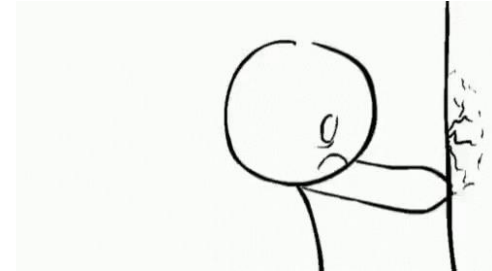
# Whose data is it?

- It should be yours
- Or a grant collaborator's that fills a gap
- If it isn't yours, how do you prove you can do the work?
- If not yours, make sure it is cited



# What data is it?

- Quantitative always helps
- But qualitative works
  - Photomicrograph, technique demonstration
- Does not have to be paper ready
  - Low sample size, first run data
  - It is that hint you first got suggesting maybe you've got something
- Can be from a recent paper
- Careful balance
  - cannot show that you've already done the proposed work



# So, how do you get data without money?

- Network with similarly interested labs
  - Tissue, organs, cells, animals unneeded...
  - Helps for collaboration
- Startup, foundation, society, career development awards
- R03, R21 awards that don't need prelim data
  - for novel avenues of research

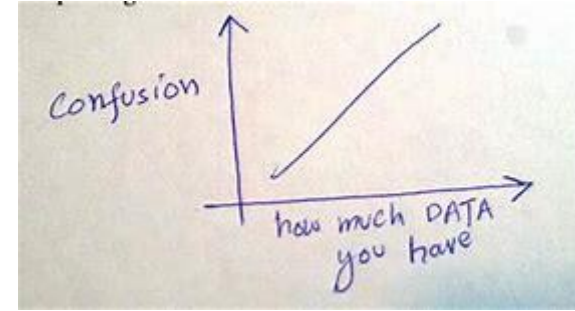


# Where do I put prelim data

- Options:
  - Applicable area in research strategy
  - Separate section
  - Weave into each specific aim rationale
- Add demonstration of techniques into the methodology of the applicable aim

# How should prelim data appear

- Keep it simple
  - Size – make it legible but watch your space
  - Significance – bring the stats
  - Color if needed
  - Easy to interpret from legend + figure alone
- Make a .jpg that will not change with text changes
- Group the legend and figure, don't struggle with format



# My own work, just one example

- Sections of grant:
  - Page 1: significance, innovation, scientific rigor, background information (1-2 paragraphs each)
  - Page 2-4: preliminary data with figures, legends, final summary
  - Pages 5-12: research plan with additional prelim data integrated to demonstrate capability

# My own work, just one example

Asm activity and cellular ceramide concentration have been demonstrated to regulate platelet cell membrane organization and platelet-derived thrombus formation.(21, 43) Therefore, we sought to determine the role of ceramide generation in post-TBI platelet dysfunction, utilizing the extensive sphingolipid expertise of Dr. Gulbins. Platelet ceramide levels were evaluated utilizing a diacylglycerol kinase assay. Ten minutes after TBI, platelets were found to have decreased ceramide levels.(Figure 2), suggesting that TBI leads to rapid changes in platelet ceramide levels as well as ADP-induced platelet aggregation.

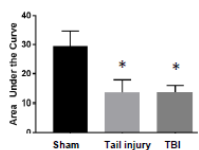


Figure 1: Decreased ADP-induced platelet aggregation 10 min after TBI. \*p<0.05 vs Sham, n=5

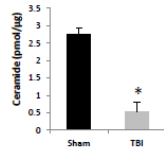


Figure 2: Platelet ceramide levels 10 min after TBI. \*p<0.05, n=3

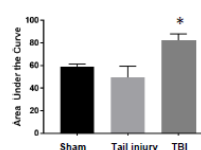


Figure 3: Increased ADP-induced platelet aggregation 6 hours after TBI. \*p<0.05 vs Sham, n=5

Taken together, our preliminary data demonstrate that there are time-dependent divergent effects of TBI on coagulation and platelet activation and that ceramide may play a critical role in the regulation of platelet function and MV generation. This is impactful in that modulation of ceramide in the posttraumatic period may ameliorate the pro-thrombotic disposition of the head injured patient to minimize the development of posttraumatic thrombotic events, prevent multi-organ system failure and reduce the rate of delayed deaths after TBI.

## Box 1: Summary of preliminary data

- TBI induces dynamic platelet function and coagulation changes
- Acute platelet dysfunction is characterized by loss of ADP-induced aggregation
- Increased platelet aggregation and activation contribute to early (6 hour) hypercoagulability
- Procoagulant platelet-derived MVs contribute to delayed (24 hour) hypercoagulability
- Platelet ceramide levels are associated with alterations in platelet function
- Novel genetic overexpression of platelet Asm increases ADP-induced platelet aggregation

## Aim 3b: Investigate how ceramide influences the role of TBI platelets / PMVs in propagating macrovascular thrombosis

**Rationale.** TBI patients have an increased risk of deep vein thrombosis and pulmonary embolism.(28) This aim will define the predisposition for intravascular thrombosis following TBI and determine the role of platelet Asm in contributing to this coagulation process. We hypothesize that PMVs and platelet activation will be reduced in mice lacking platelet Asm resulting in decreased platelet ceramide, leading to decreased macrovascular thrombosis, an effect that may be reversed with supplementation of post-TBI WT platelets and PMVs.

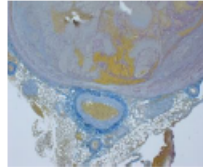


Figure 14: Photomicrograph of clot in IVC (top) compared to patent artery (bottom). MSB stain. yellow = red blood cells blue = acellular clot

**Study 1:** WT and Asm KO mice will undergo TBI or sham treatment. Mice will be assessed for venous clotting potential at 6 and 24 h after TBI by inducing venous thrombosis with an inferior vena cava (IVC) 90% stenosis model (Uninjured mice 16.7 ± 2.5mg). Total clot within the IVC will be measured by vein weight and cross sectional

# Summary

- Know if you need it
- If you have it, include it, but don't overdo it
- Proof of you, your work, and your capabilities
- Organize appropriately
- Keep it simple

# Thanks!

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