Thinking Like a Reviewer: Strategies to Improve Grant Success

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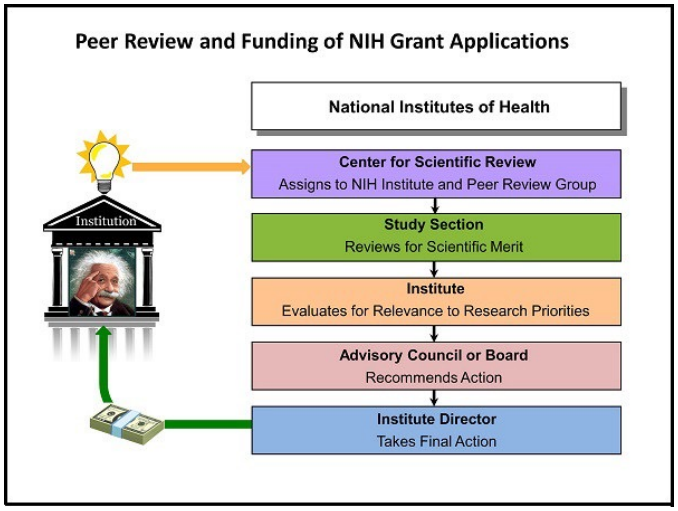
1. What happens to my grant or fellowship?

NIH Peer Review



https://public.csr.nih.gov/aboutcsr/NewsAndPublications/PeerReviewNotes/Pages/USBiomedicalResearchNIHFormulaSuccess.aspx

2. Who are the reviewers?

At NIH: All working scientists

- General Qualifications:
  - Expertise
  - Stature in field
  - Mature judgment
  - Impartiality
  - Ability to work well in a group
  - Managed conflicts of interest
  - Balanced representation
  - *Availability*

Picture courtesy of the NIH Center for Scientific Review

From a presentation by Sally A. Amero, PhD, and Weijia Ni, PhD, at 2018 NIH Regional Seminar

2. Who are the reviewers?

Other agencies, especially foundations:

- May be working scientists with expertise in your field
- May NOT be experts in your field
- May include lay reviewers

2. Who are the reviewers?

Tips:

1. Find out as much as you can about who the reviewers will be and write for them!
2. Special NIH funding opportunity that doesn't go to a standing study section: contact the program official and ask about the reviewers

3. How will they review my grant?

Questions all funding agencies ask:

- Does the grant address an important question, problem, or need?
- Does the grant propose something new?
- Do the investigators have a solid plan for answering the question, solving the problem, or fulfilling the need?
- Do the investigators have the necessary expertise and experience to do this work?
- Do the investigators have access to the resources (equipment, patient populations, lab space, clinical specimens, supplies, intellectual know-how, etc.) necessary to do the proposed work?
- Does the project fit our mission/priorities?

Questions all grant reviewers ask (NIH-speak):

Significance

Innovation

Approach

Investigator

Environment

Overall Impact:

the likelihood for the project to exert a sustained, powerful influence on the research field(s) involved.

- Should they do it?
- Can they do it?

NIH Scoring System

- Reviewers give numerical scores
  - 1 (exceptional) to 9 (poor)
  - Used for criterion scores and final impact score

Impact	Score	Descriptor
High Impact	1	Exceptional
	2	Outstanding
	3	Excellent
Moderate Impact	4	Very Good
	5	Good
	6	Satisfactory
Low Impact	7	Fair
	8	Marginal
	9	Poor

From a presentation by Sally A. Amero, PhD, and Weijia Ni, PhD, at 2018 NIH Regional Seminar

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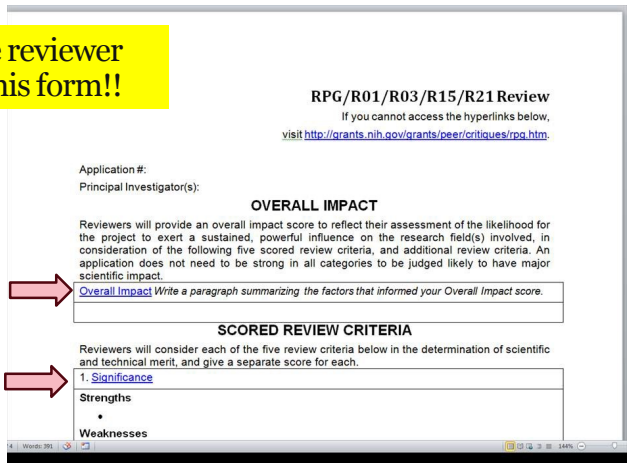
Written Critiques

Help the reviewer fill out this form!!

Links to definitions of review criteria



RPG/R01/R03/R15/R21 Review

If you cannot access the hyperlinks below, visit http://grants.nih.gov/grants/peer/critiques/rpg.htm.

Application #:

Principal Investigator(s):

OVERALL IMPACT

Reviewers will provide an overall impact score to reflect their assessment of the likelihood for the project to exert a sustained, powerful influence on the research field(s) involved, in consideration of the following five scored review criteria, and additional review criteria. An application does not need to be strong in all categories to be judged likely to have major scientific impact.

Overall Impact *Write a paragraph summarizing the factors that informed your Overall Impact score.*

SCORED REVIEW CRITERIA

Reviewers will consider each of the five review criteria below in the determination of scientific and technical merit, and give a separate score for each.

1. Significance

Strengths

•

Weaknesses

From a presentation by Sally A. Amero, PhD, and Weijia Ni, PhD, at 2018 NIH Regional Seminar

SIGNIFICANCE

- Does this study address an important problem?
- If the aims are achieved, how will scientific knowledge be advanced?
- What will be the effect on concepts or methods that drive this field?
- Is the prior research that serves as the key support for the proposed project rigorous?

Text from a presentation by Rebekah S. Rasooly, Ph.D., NINR/NIH at 2018 NIH Regional Seminar

Tips for the Significance section

1. Start with one or two paragraphs about the importance of the problem.
2. Then, several paragraphs about the premise and rigor of prior work.
3. Focus on key things that MUST be correct for your work to be feasible
4. May include a carefully selected figure of published or preliminary data

Tips for the Significance section

5. Focus on gaps in knowledge – what areas have previous papers not addressed?
6. Mention how you will address those gaps
7. Use headings to make things easy to find
8. Significance section usually ~1.5 pages

Example from an F32

(A) SIGNIFICANCE

(A.1) Importance of the Problem

Heart disease is the leading cause of death of both men and women in the U.S., accounting for one in every four deaths[1]. A major risk factor for heart disease is obesity, and several studies in humans, nonhuman primates, and rodents demonstrated a positive correlation between maternal obesity and risk of cardiovascular disease in offspring[2–4]. For example, recent epidemiological studies found that offspring of overweight and obese women were at 1.15- and 1.30-fold, respectively, increased risk of cardiovascular events[5]. This suggests that maternal obesity programs metabolic derangement in the offspring, but the mechanisms by which this occurs are unknown. Given that nearly 50% of US women of childbearing age are overweight or obese[6], we must overcome this *critical barrier* to improving the cardiovascular health of offspring of overweight/obese women.

(A.2) Scientific Premise

Cardiac dysfunction and energy signaling: By weight, the heart is the second-most energy demanding organ in the body[7], and cardiac cells rely heavily on mitochondrial oxidative phosphorylation for production of ATP[8,9,10]. The heart uses both glucose and fatty acid oxidation for ATP production[8] (~30% ATP derived from carbohydrates and ~70% ATP derived from fat in the fasted state)[9,10], but the ratio of glucose and fatty acid oxidation is affected by many factors including sex[11], age[12], ischemia[13], pressure-overload hypertrophy, and insulin stimulation[14]. For example, cardiac metabolism switches from primarily utilizing glucose to primarily utilizing fatty acids as pulmonary circulation commences at birth[15]. A subsequent decrease in fatty acid oxidation is observed with aging, without detectable changes in glucose utilization[16,17]. The percent contribution between glucose and fatty acid oxidation can be acutely altered as well, such as an increase in glucose oxidation during ischemia[18]. Because an overall decrease in substrate oxidation contributes to heart failure and contractile dysfunction[19], mitochondrial damage and decreased energy production are likely to cause cardiac dysfunction. Additionally, contractile dysfunction can lead to cardiac remodeling, and the increased energetic demand imposed by this process combines with an inability to increase the energetic supply to exacerbate the dysfunction[14].

INVESTIGATOR

- Are the investigators appropriately trained and well suited to carry out this work?
- Is the work proposed appropriate to the experience level of the principal investigator and other researchers?
- Does the investigative team bring complementary and integrated expertise to the project (if applicable)?
- Reviewers will largely rely on the Biosketches to assess this criterion

Text from a presentation by Rebekah S. Rasooly, Ph.D., NINR/NIH at 2018 NIH Regional Seminar

Tips for Biosketches

1. Mention your relevant expertise in the Personal Statement.
2. Highlight collaborations with Co-investigators.
3. Highlight ability to direct a team.

A. Personal Statement

I am a physician-scientist focused on evidence-based labor and delivery management, preterm birth, and medical complications of pregnancy. I am board certified in Obstetrics & Gynecology and Maternal-Fetal Medicine and formally trained in Epidemiology, and I am Chief of XXX. I have completed several clinical trials including a recent trial (N=1147) comparing XXXX to YYY for prevention of XXXX published in the *New England Journal of Medicine*. I am also PI of an ongoing multicenter trial testing the effectiveness of …. (NIH/NICHD - R01HDXXX). Directly relevant to this proposal, I have a longstanding collaboration with Dr. XX and past or ongoing collaborations with the Co-investigators (Drs. XX, YY, ZZ). My experience leading large clinical studies and my established collaborations with the study team make me well suited to serve as a PI of this project testing the hypothesis that….

Washington University School of Medicine in St. Louis
Department of Obstetrics and Gynecology

Tips for Biosketches

4. Edit the personal statements from your other key personnel so they are tailored to this grant.

5. Check that all biosketches follow the instructions!

6. List the most relevant "contribution to science" first.

7. Use headings for the "contributions to science".

3. **Preventing surgical site infection after cesarean delivery**: Postoperative infection is one of the most common complications of cesarean delivery. We performed detailed analysis of a large retrospective cohort of women undergoing cesarean delivery to identify risk factors for infection after cesarean. Our data confirmed obesity as a major risk factor for cesarean and showed a dose-response relationship between increasing body mass index and postoperative infection. We also found that cesareans performed in the second trimester were associated with a higher risk of infection than those performed in the second stage of labor. Finally, because metallic staples and subcuticular suture are the two most common methods of closing the skin after cesarean, we conducted a systematic review and meta-analysis to determine which method minimizes wound complications. Our data showed that the subcuticular suture closure reduced the risk of wound complications (infection and disruption) by 50%. These findings were confirmed in subsequent large randomized trials and have changed clinical practice in favor of subcuticular suture closure.

Conner SN, Verticchio JC, Tuuli MG, Odibo AO, Macones GA, Cahill AG. Maternal obesity and risk of postcesarean wound complications. Am J Perinatol. 2014 Apr;31(4):299-304.

Tuuli MG, Liu L, Longman RE, Odibo AO, Macones GA, Cahill AG. Infectious morbidity is higher after second-stage compared with first-stage cesareans. Am J Obstet Gynecol. 2014 Oct;211(4):410.e1-6

Tuuli MG, Rampersad RM, Carbone JF, Stamilio D, Macones GA, Odibo AO. Staples compared with subcuticular suture for skin closure after cesarean delivery: a systematic review and meta-analysis. Obstet Gynecol. 2011 Mar;117(3):682-90. PubMed PMID: 21343772.

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INNOVATION

- Does the application challenge and seek to shift current research or clinical practice paradigms?
- Are the concepts, approaches or methodologies, instrumentation, or interventions novel to one field of research or novel in a broad sense?
- Is a refinement, improvement, or new application of theoretical concepts, approaches or methodologies, instrumentation, or interventions proposed?

Text from a presentation by Rebekah S. Rasooly, Ph.D., NINR/NIH at 2018 NIH Regional Seminar

Tips for Innovation

1. Use headings to make things easy for the reviewer to find.

A novel hypothesis: We propose that XX can be predicted by integrating X, Y, and Z. This hypothesis encompasses a supercool idea and addresses the importance of the dynamic interplay between X, Y, and Z … Additionally, ours will be the first study to simultaneously assess X, Y, and Z longitudinally.

A novel technology – XX: blah blah (Figure XX) blah blah blah blah blah blah blah blah blah blah blah blah blah blah blah blah blah blah

Tips for Innovation

1. Use headings to make things easy for the reviewer to find.
2. In general, keep this section short (~1/4 page).
3. Be flexible; do what works well for a given grant. If a figure would help, then include it. If the reader needs a lot of information to understand the innovation, then provide it.
4. Make sure claims are well-justified.

Possible Things to Include in Innovation

- Novel hypothesis
- Novel drug, inhibitor, or drug target
- Novel method or technology
- Novel mouse (or other animal) model
- New use of an old tool
- New explanation for an old phenomenon
- First to do something
- Use of an understudied (or in some other way novel) population
- Use of state-of-the-art technology
- First clinical trial to address X
- Novel clinical study design
- Research that will enable new treatments for an important disease (future innovation)

Innovation & reviews of 12 R01s (6 funded)

- Reviewers cite same things as authors (12 out of 12 grants).
- Reviewers point out things they felt were Innovative but the Investigator didn't note (5 out of 12 grants).
- Reviewers may include concerns about Approach in their comments on Innovation (4 out of 12 grants).
- Reviewers note if they are not convinced by an argument in Innovation (3 out of 12 grants).
- Innovation scores on funded grants: 2/2/1, 1/1/3, 1/2/2, 3/2, 1/2/2, 2/2/4 (avg. 1.9)
- Innovation scores on unfunded grants: 3/1/2, 1/3, 2/2/4, 2/3/1, 1/1/2, 2/1 (avg. 1.9)

Approach score drives overall impact score

IC	Approach	Significance	Innovation	Investigator	Environment	Number of Applications with Impact Scores
FIC	0.78	0.59	0.51	0.45	0.54	125
NCCAM	0.78	0.63	0.60	0.60	0.54	285
NCI	0.80	0.67	0.59	0.53	0.45	5396
NCMHD	0.82	0.69	0.75	0.71	0.57	57
NEI	0.83	0.69	0.62	0.59	0.49	777
NHGRI	0.79	0.69	0.61	0.58	0.52	224
NHLBI	0.82	0.67	0.64	0.56	0.48	3157
NIA	0.84	0.73	0.65	0.58	0.55	1521
NIAAA	0.84	0.71	0.63	0.51	0.41	427
NIAID	0.82	0.67	0.62	0.55	0.47	3809
NIAMS	0.84	0.65	0.65	0.57	0.49	1051
NIBIB	0.77	0.68	0.63	0.54	0.49	894
NICHD	0.83	0.70	0.63	0.54	0.49	2074
NIDA	0.83	0.69	0.60	0.54	0.47	1230
NIDCD	0.82	0.69	0.58	0.51	0.40	443
NIDCR	0.86	0.70	0.68	0.62	0.54	538
NIDDK	0.83	0.69	0.63	0.60	0.50	2271
NIEHS	0.83	0.68	0.64	0.56	0.49	490
NIGMS	0.83	0.72	0.63	0.62	0.53	2856
NIMH	0.80	0.68	0.58	0.50	0.44	1896
NINDS	0.81	0.67	0.60	0.55	0.49	2262
NINR	0.83	0.70	0.66	0.59	0.53	260
NCRR	0.81	0.69	0.65	0.59	0.56	426
NLM	0.88	0.74	0.82	0.71	0.67	139
NIH	**0.82**	**0.69**	**0.62**	**0.56**	**0.49**	**32,608**

Correlation coefficient

https://loop.nigms.nih.gov/wp-content/uploads/2010/10/table_berg2010100930_hi.jpg

APPROACH

- Are the conceptual framework, design, methods, and analyses adequately developed, well-integrated, and appropriate to the aims of the project?
- Does the applicant acknowledge potential problem areas and consider alternatives?

Text from a presentation by Rebekah S. Rasooly, Ph.D., NINR/NIH at 2018 NIH Regional Seminar

Rigor and Reproducibility

Part of NIH review criteria:
Have the investigators presented strategies to ensure a robust and unbiased approach, as appropriate for the work proposed?

As appropriate, be sure to address:
- Appropriate sample size
- Solid statistical analysis plan
- Blinding to treatment groups
- Blinded analysis of data
- Randomization

Example: "To ensure *rigor and reproducibility*, we will…"

Do NOT write an approach section that feels like this:

https://techcrunch.com/wp-content/uploads/2013/10/funny_picture_032.jpg?w=1390&crop=1

https://s3.amazonaws.com/thumbnails.illustrationsource.com/huge.102.514057.JPG

DO write an approach section that feels like this:

shutterstock.com · 329935961

https://lgeatsthemoon.files.wordpress.com/2014/09/img_0019.jpg

Suggested Outline for each Aim in a lab-based proposal (1)

- Background and rationale (may include preliminary data that supports the idea)
- Hypothesis to test
- Question 1/Experiment 1
  - Rationale/question to ask
  - Method (may include preliminary data to support idea or experimental capability)
  - How you will analyze data
  - Outcome if your hypothesis is correct
- Question 2/Experiment 2
  - Rationale/question to ask
  - Method (may include preliminary data)
  - How you will analyze data
  - Outcome if your hypothesis is correct

Suggested Outline for each Aim in a lab-based proposal (2)

- Anticipated outcomes, potential challenges, & alternative approaches
  - State what you will learn from the aim as a whole
  - List potential challenges and what you will do about them
  - State what you will learn if your hypothesis is wrong

Suggested Outline for the Approach in a Clinical Trial Proposal (1)

- Overview of the trial
  - One-paragraph summary of what you will do and measure
- Sites
  - Describe where trial will be conducted
  - Attributes of each site (e.g., patient population)
- Participants
  - Recruitment strategy
  - Inclusion and exclusion criteria
- Intervention arms
  - Describe each arm
  - Randomization and blinding

Suggested Outline for a Clinical Trial Proposal (2)

- Each Aim
  - Hypothesis
  - Data to collect
    - Primary and secondary outcomes
  - Data analysis
  - Sample size calculation
  - Sample size justification (prove you can recruit the required number of people)
  - Statistical analysis
- Safety monitoring
  - Data and safety monitoring board
  - Adverse events reporting
  - Interim analyses
- Potential challenges, alternative approaches

Figures

- Use to illustrate hypothesis

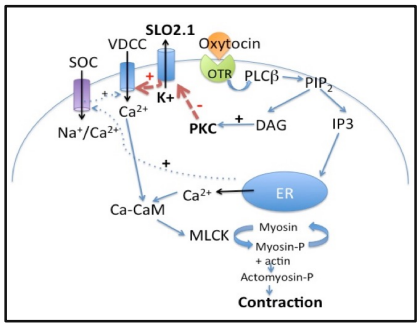


Fig. 1. Hypothesized model. Described fully in **C2a**. DAG, diacylglycerol; IP3, inositol triphosphate; MLCK, myosin light chain kinase; OTR, oxytocin receptor; PIP_2, phosphatidylinositol 4,5-bisphosphate; PLC, phospholipase C; PKC, protein kinase C; SOC, store-operated Ca^{2+} channel; SR, sarcoplasmic reticulum; VDCC, voltage-dependent Ca^{2+} channel.

Figures

- Illustrate techniques you propose to use in the grant

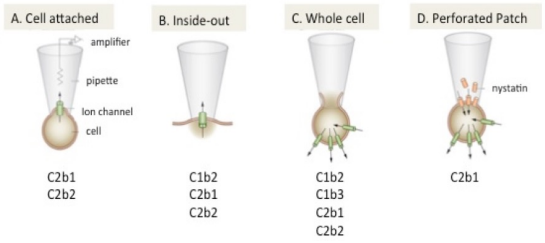


Fig. 5. Configurations of the patch-clamp recording techniques used in the indicated parts of the proposal.

Figures

- Place carefully on the page
  - Ideally on page where referenced in text
- Wrap text around figure

membrane potential. We have recently established this methodology in the England laboratory (**Fig. 9**). For all electrophysiological measurements, MSMC currents will be measured under conditions in which BK_{Ca} (SLO1) channels are blocked. For the initial characterization of action potential generation, we will use current-clamp measurements in tissue to measure changes in membrane potential, which should enable us to determine how the loss of SLO2.1 alters both background leak current and the generation of action potentials. In addition to action potential frequency, we will measure membrane potential, burst frequency, burst duration, and interburst interval (**Fig. 10**). We anticipate finding that knockdown of SLO2.1 will result in depolarization of the myometrial strips, increased burst frequency, longer burst duration, and shorter interburst interval.

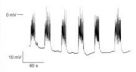


Fig. 9. Sharp-electrode current clamp on the longitudinal muscle layer of a P14 mouse uterine strip. The tissue was maintained in 10 μM wortmannin to inhibit myosin light-chain kinase and prevent contractions. *Unpublished.*

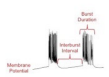


Fig. 10. Sharp electrode measurements to be analyzed in Aim 3.

We will also perform experiments in the presence and absence of oxytocin with the expectation that the addition of oxytocin will produce a smaller incremental depolarization of membrane potential when SLO2.1 channel expression is knocked down than in control strips.

C3b2) What effect does SLO2.1 have on in vivo contraction frequency?

We hypothesize that SLO2.1 contributes to the pacing of uterine contractions *in vivo*. To assess this possibility, we will use intrauterine telemetry in mice – a technique developed by the England laboratory (39) – to compare *in vivo* contraction frequencies between uteri treated with scrambled shRNA and those treated with shRNA targeting SLO2.1. In this method, a radiotelemetric transmitter is surgically inserted into the mouse uterus, where it measures intrauterine pressure (40). The changes in intrauterine pressure can be recorded continuously or at specific time points, allowing for analysis of contraction force, frequency, and overall patterning at various stages of pregnancy and labor (**Fig. 11**).

For these experiments, we will anesthetize P8 mice with isoflurane. A small incision will be made through the skin, body wall, and anterior part of the uterine horn. The telemeter will be guided through this incision and implanted within the uterine cavity between the uterine wall and fetal sacs in mice at P8. Vehicle control or lentivirus expressing *Slo2.1* shRNA or scrambled-shRNA (using the same volume and number of viral particles) will be injected into the uterus at the same time. Contraction frequency will be measured starting at 48–72 hours post-surgery and ending after delivery. The timing will need to be optimized on the basis of the time needed for SLO2.1 knockdown (which will be determined in separate experiments by Western blot analysis or qRT-PCR). Contraction frequency will be analyzed by counting the number of half-maximal contractions in 10 minutes, and compared between the three treatments. Experiments will be performed on at least 10 mice (although power analysis will need to be performed after we identify the degree of knockdown we achieve with each shRNA). Longitudinal changes in intrauterine pressure will be analyzed by using a linear-mixed effect model as we have previously described (41). $P<0.05$ will be considered significant. We anticipate that knocking down SLO2.1 expression will significantly increase uterine contractions, which will be reflected in enhanced uterine pressures in the mouse.

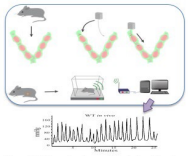


Figure 11. Schematic of mouse intrauterine telemetry. Top, a telemeter is implanted in one uterine horn of a mouse. Middle, uterine pressure is measured. Bottom, data are analyzed.

ENVIRONMENT

- Does the scientific environment in which the work will be done contribute to the probability of success?
- Do the proposed experiments take advantage of unique features of the scientific environment or employ useful collaborative arrangements?
- Is there evidence of institutional support?

Text from a presentation by Rebekah S. Rasooly, Ph.D., NINR/NIH at 2018 NIH Regional Seminar

Tips for Environment

1. Be thorough! (no page limits for facilities)
2. Write the facilities section to be specific to the grant (e.g., delete the part about MRI facility if not using it in the Approach).
3. Discuss intellectual environment (e.g., seminars, journal clubs), especially for fellowships.
4. Describe special intellectual centers.
5. Include letters of support from chair, consultants, cores, etc.

Before Study Section Meets

- Grants are sent to reviewers 6-8 weeks before study section
- Reviewers score the grant in each of the review criteria and write comments (strengths and weaknesses)
- Reviewers submit preliminary impact scores and comments
- Grants ranked according to these scores
- Reviewers can see other scores and comments
- Reviewers may revise their scores

Streamlining Applications

- Bottom half of grants are not scored/triaged/not discussed
- Summary statements contain:
  - Reviewer critiques
  - Criterion scores

From a presentation by Sally A. Amero, PhD, and Weijia Ni, PhD, at 2018 NIH Regional Seminar

At the Review Meeting

- Any member in conflict with an application leaves the room.
- Reviewer 1 introduces the application and presents critique

From a presentation by Sally A. Amero, PhD, and Weijia Ni, PhD, at 2018 NIH Regional Seminar

Pictures courtesy of the NIH Center for Scientific Review

Your goal: Make it easy for reviewer 1 to advocate for your grant

- Highlight significance
- Highlight innovative aspects
- Make grant easy to read
- Make anticipated outcomes clear
- Address any potential criticisms in the grant

At the Review Meeting

- Reviewers 2 and 3 present their critiques
- All members join the discussion; Summary by Chair.
- Assigned reviewers provide final scores, setting range.
- <u>All members</u> provide final scores privately.

From a presentation by Sally A. Amero, PhD, and Weijia Ni, PhD, at 2018 NIH Regional Seminar

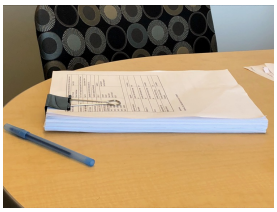
Your goal: Make it easy for other reviewers to quickly understand the main points of your grant

- They will likely only read your aims page and biosketches (while listening to discussion)
- Make aims page EASY to read
- Highlight significance in aims page
- Highlight outcomes in aims page
- Highlight relevant expertise of team in biosketches

Things you should know about grant reviewers:

1. May or may not be experts in your field
   - You must demonstrate accurate knowledge of the field
   - Grant must be understandable by a non-specialist
2. Busy professors who may not put a lot of time and effort into reading grant
   - Grant must be easy to read
     - Logic of experiments
     - Format: white space, reasonable font size, clear figures
     - No sloppiness!

Keep these images in mind



http://www.english-online.at/news-articles/living/child-free-flights-in-the-future.htm

4a (Code) (Expenses $ 8,040,927 including grants of $ 62,595) (Revenue $ 203,166)

THE MINNESOTA ORCHESTRA IS RECOGNIZED FOR DISTINGUISHED PERFORMANCES AROUND THE WORLD, AWARD-WINNING RECORDINGS, RADIO BROADCASTS AND EDUCATIONAL PROGRAMS, AND COMMITMENT TO BUILDING THE REPERTOIRE OF THE FUTURE THE ENSEMBLE NOW PRESENTS NEARLY 175 CONCERTS THAT ARE HEARD LIVE BY 350,000 INDIVIDUALS, AND EDUCATION AND OUTREACH PROGRAMS THAT SERVE 85,000 MUSIC LOVERS OF ALL AGES THE ORCHESTRA MAKES ITS HOME AT ORCHESTRA HALL IN MINNEAPOLIS, WHERE ITS CONCERTS ARE BROADCAST ACROSS THE STATE EACH FRIDAY EVENING BY MINNESOTA PUBLIC RADIO MANY PROGRAMS ARE SUBSEQUENTLY HEARD NATION-WIDE ON AMERICAN PUBLIC MEDIA RADIO PROGRAMS THE MINNESOTA ORCHESTRA, NOW IN ITS SECOND CENTURY, HAS LONG RANKED AMONG AMERICA'S TOP SYMPHONIC ENSEMBLES, WITH A DISTINGUISHED HISTORY OF ACCLAIMED PERFORMANCES IN ITS HOME STATE AND AROUND THE WORLD, AWARD-WINNING RECORDINGS, RADIO BROADCASTS AND EDUCATIONAL OUTREACH PROGRAMS, AND A VISIONARY COMMITMENT TO BUILDING THE ORCHESTRAL REPERTOIRE OF TOMORROW THE ENSEMBLE ANNUALLY PRESENTS NEARLY 175 PROGRAMS IN A TYPICAL YEAR, PRIMARILY AT ITS HOME VENUE OF ORCHESTRA HALL IN DOWNTOWN MINNEAPOLIS, WHICH UNDERWENT A MAJOR RENOVATION IN 2012-13 THE ORCHESTRA'S CONCERTS ARE HEARD BY LIVE AUDIENCES OF 350,000 EVERY YEAR THE ORCHESTRA'S INTERNATIONAL TOURS HAVE REAPED SIGNIFICANT PRAISE, MOST RECENTLY A CRITICALLY LAUDED 2010 TOUR OF EUROPEAN FESTIVALS DURING THIS TOUR THE ORCHESTRA PERFORMED AT THE EDINBURGH INTERNATIONAL FESTIVAL, AMSTERDAM'S CONCERTGEBOUW AND THE BBC PROMS IN LONDON-BEFORE CHEERING CROWDS TOTALING 12,000 FOR TWO CONCERTS AT ROYAL ALBERT HALL, ONE [illegible] NISKA, THE ENSEMBLE UN[illegible] A IN 2005, 2007 AND 2[illegible] ME OF THE FIRST TO BE [illegible] FOR BIS RECORDS, INC[illegible] CYCLE] OF OUR TIME " TH[illegible] THE ALBUM FEATURING[illegible] KA ALSO RECORDED [illegible] URTH SYMPHONY, AN AL[illegible] SYMPHONIES, INC[illegible] PERFORMANCE TH[illegible] FOR MORE THAN 35 YE[illegible] PERFORMANCE TO[illegible] MUSIC LOVERS AN[illegible] TS CENTENNIAL DURI[illegible] OUNG PEOPLE'S CONCERT MUSICIANS ALSO ENGAGE IN SUCH ORCHESTRA-SPONSORED INITIATIVES AS THE ADOPT-A-SCHOOL PROGRAM, SIDE-BY-SIDE REHEARSALS AND CONCERTS WITH YOUNG AREA MUSICIANS, AND THE UPBEAT PROGRAM, WHICH ESTABLISHES MULTI-YEAR RELATIONSHIPS WITH COMMUNITIES THROUGHOUT THE TWIN CITIES AND AROUND THE STATE IN 2011, EXTENDING A LONG TRADITION OF PERFORMANCES THROUGHOUT THE STATE OF MINNESOTA, THE ORCHESTRA LAUNCHED COMMON CHORDS THIS MULTI-YEAR INITIATIVE IS DESIGNED TO CREATE PARTNERSHIPS BETWEEN THE ORCHESTRA AND PARTICIPATING MINNESOTA CITIES, CULMINATING IN A CELEBRATORY FESTIVAL WEEK THAT FEATURES PERFORMANCES AND DOZENS OF ACTIVITIES THAT REFLECT THE INTERESTS, DIVERSITY AND HERITAGE OF EACH COMMUNITY LAUNCHED WITH SUPPORT FROM THE ANDREW W MELLON FOUNDATION, COMMON CHORDS PRESENTED ITS FIRST FESTIVAL WEEK IN GRAND RAPIDS, MINNESOTA, IN OCTOBER 2011, A SECOND PARTNERSHIP IN WILLMAR, MINNESOTA, CULMINATED IN MAY 2012 AND ADDITIONAL PARTNERSHIPS ARE PLANNED IN THE YEARS AHEAD ALONG WITH ITS CORE SERIES OF CLASSICAL CONCERTS, THE MINNESOTA ORCHESTRA OFFERS NUMEROUS POPS CONCERTS IN A SERIES LED BY CONDUCTOR SARAH HICKS, PRESENTING THE GREATEST CONTEMPORARY POP PERFORMERS IN GENRES RANGING FROM LATIN, JAZZ AND BIG BAND TO BROADWAY, COUNTRY AND WORLD MUSIC IN 2008, THE ORCHESTRA ESTABLISHED JAZZ AT ORCHESTRA HALL, A JAZZ SERIES FEATURING TOP PERFORMERS FROM AROUND THE NATION, AND NAMED IRVIN MAYFIELD AS THE SERIES' ARTISTIC DIRECTOR AMERICAN CONDUCTOR ANDREW LITTON SERVES AS ARTISTIC DIRECTOR FOR THE ORCHESTRA'S BELOVED URBAN SUMMER MUSIC FESTIVAL, SOMMERFEST IT SHOULD BE NOTED THAT THE MINNESOTA ORCHESTRA'S ENTIRE 2012-13 CONCERT SEASON WAS CANCELLED DUE TO A LABOR DISPUTE FOLLOWING SIX MONTHS OF NEGOTIATIONS WITH THE MUSICIANS' UNION THAT DID NOT YIELD A CONTRACT SETTLEMENT, THE BOARD INSTITUTED A LOCKOUT ON OCTOBER 1, 2012, WHICH EXTENDED THROUGH JANUARY 2014 A SETTLEMENT - IN WHICH MUSICIANS ACCEPTED AN AVERAGE 15% SALARY REDUCTION OVER A THREE-YEAR CONTRACT - WAS REACHED ON JANUARY 14 MUSICIANS RETURNED TO WORK ON FEBRUARY 1 AND THE ORCHESTRA BEGAN PERFORMING CONCERTS AGAIN ON FEBRUARY 7, 2014 PRESIDENT AND CEO MICHAEL HENSON SUBSEQUENTLY ANNOUNCED IN MARCH 2014 THAT HE PLANNED TO STEP DOWN FROM THE ORGANIZATION IN AUGUST 2014 HENSON WAS APPOINTED PRESIDENT IN 2007 THE BOARD OF DIRECTORS IS ESTABLISHING A COMMITTEE TO SEARCH FOR HIS SUCCESSOR

Avoid the wall of text!!!!!

http://trollpasta.wikia.com/wiki/File:Wall-of-text.jpg

(A) SIGNIFICANCE

(A.1) Importance of the Problem

Heart disease is the leading cause of death of both men and women in the U.S., accounting for one in every four deaths[1]. A major risk factor for heart disease is obesity, and several studies in humans, nonhuman primates, and rodents demonstrated a positive correlation between maternal obesity and risk of cardiovascular disease in offspring[2–4]. For example, recent epidemiological studies found that offspring of overweight and obese women were at 1.15- and 1.30-fold, respectively, increased risk of cardiovascular events[5]. This suggests that maternal obesity programs metabolic derangement in the offspring, but the mechanisms by which this occurs are unknown. Given that nearly 50% of US women of childbearing age are overweight or obese[6], we must overcome this *critical barrier* to improving the cardiovascular health of offspring of overweight/obese women.

(A.2) Scientific Premise

Cardiac dysfunction and energy signaling: By weight, the heart is the second-most energy demanding organ in the body[7], and cardiac cells rely heavily on mitochondrial oxidative phosphorylation for production of ATP[8,9,10]. The heart uses both glucose and fatty acid oxidation for ATP production[8] (~30% ATP derived from carbohydrates and ~70% ATP derived from fat in the fasted state)[9,10], but the ratio of glucose and fatty acid oxidation is affected by many factors including sex[11], age[12], ischemia[13], pressure-overload hypertrophy, and insulin stimulation[14]. For example, cardiac metabolism switches from primarily utilizing glucose to primarily utilizing fatty acids as pulmonary circulation commences at birth[15]. A subsequent decrease in fatty acid oxidation is observed with aging, without detectable changes in glucose utilization[16,17]. The percent contribution between glucose and fatty acid oxidation can be acutely altered as well, such as an increase in glucose oxidation during ischemia[18]. Because an overall decrease in substrate oxidation contributes to heart failure and contractile dysfunction[19], mitochondrial damage and decreased energy production are likely to cause cardiac dysfunction. Additionally, contractile dysfunction can lead to cardiac remodeling, and the increased energetic demand imposed by this process combines with an inability to increase the energetic supply to exacerbate the dysfunction[14].

Things you should know about grant reviewers:

3. First impressions count
   - "The Aims page speaks volumes how you think the entire grant is going to be. I can likely tell you based on the aims page what range the grant will fall in. This poorly written grant is a great idea, but the aims page shows lack of focus. The writing was terrible and the descriptions were vague. The good grant had well-documented rationales and clear hypotheses." –Study section member
4. Look at *all* the parts of the grant
   - Make sure human subjects, biosketches, etc., are complete and accurate
5. May have reviewed your recently submitted paper
   - Don't claim it's accepted if it isn't

General tips for fellowship training and career plans:

- They are funding YOU, not the project
  - Project should be solid and illustrate your ability to think and plan
  - Project should match your career plan
- Mentor issues
  - If project requires expertise your mentor doesn't have, get a co-mentor
  - If your mentor is not senior, consider a co-mentor
  - Training plan should be personalized (read it!)
  - Training plan should match your personal statement

General tips for fellowship training and career plans:

- Career plan
  - Think: "In X years, I want to be the person who …"
  - What will your niche be?
  - How will this project and training plan help you get there?
    - For career X, you need skills A, B, C, D, and E.
    - The project will give you A and B (e.g., techniques, paper writing)
    - Part X of training plan will give you C (e.g., speaking, networking)
    - Part Y will give you D, etc. (e.g., stats, mentoring, teaching)
  - What will your next grant be about?

Washington University School of Medicine in St. Louis Department of Obstetrics and Gynecology

One last thing: A conversation I had recently…

Faculty member: "Debbie, I submitted my grant to foundation X last week."

Me: "Great! Good luck!"

Faculty member: "Now, I want to submit the same project to foundation Y. I thought this would be easy because I could just submit the same scientific description I wrote for foundation X."

Me: "Ooh… probably not…"

Faculty member: "The instructions for foundation Y don't look anything like those for foundation X! What do I do?!?"

The instructions tell you:

1. What the funder wants you to submit.
2. What the reviewers are expecting to see.

So, give them EXACTLY what they ask for!

Example from Gates Foundation

Grand Challenges Explorations Application Form

Please enter proposal text in Sections I and II according to the instructions within each section. If you choose to include charts, graphs, or references, add them within the appropriate section.

Your application must be formatted as follows.

- No longer than two (2) pages
- 11 point font or larger
- At least 0.5" margins all around
- Single line spacing
- Standard character spacing (neither expanded nor condensed)
- Arial or Times New Roman font
- The entire file should be 2MB or less

Proposals that do not adhere to these restrictions may be blocked from submission and review.

Section I. What is your idea?

Use this section to briefly describe your idea. Read the topic description carefully to make sure that your idea directly fits the topic; otherwise your proposal may be disqualified.

- Indicate in one or two sentences **in bold** the essence of your idea.
- Why is your idea an unconventional or creative approach to the problem outlined in the topic?
- Describe the hypothesis for your proposal and why you expect it to succeed.

Section II. How will you test it?

Use this section to briefly describe the project design and implementation plan.

- Describe your experimental plan, including any new technologies or tools to be developed.
- How will the work you describe be performed within the budget (USD$100,000) and time period (eighteen [18] months) allocated for the initial Phase I award? *This 18-month time period should include project work time, ramp up and required reporting.*
- What essential data will you generate during your Phase I award?
- If your experiments in Phase I are successful, what are the next steps?
- Please include a brief breakdown of allowable direct costs under the following categories: personnel, supplies, subcontracts, travel, and other expenses (equipment). Please review the Rules & Guidelines for more guidance. Indirect costs are not allowed under GCE Phase I.

My Awesome Gates Grand Challenge Proposal

Section I. My idea

Essence of the idea:
Indicate in one or two sentences **in bold** the essence of your idea.

An unconventional approach:
Why is your idea an unconventional or creative approach to the problem outlined in the topic?

Hypothesis:
Describe the hypothesis for your proposal

Likelihood of success:
and why you expect it to succeed.

Section II. My plans to test my idea

Experimental plan:
Describe your experimental plan, including any new technologies or tools to be developed.

Budget and timeline feasibility:
How will the work you describe be performed within the budget (USD$100,000) and time period (eighteen [18] months) allocated for the initial Phase I award? *This 18-month time period should include project work time, ramp up and required reporting.*

Essential data to generate:
What essential data will you generate during your Phase I award?

Next steps:
If your experiments in Phase I are successful, what are the next steps?

Costs:
Please include a brief breakdown of allowable direct costs under the following categories: personnel, supplies, subcontracts, travel, and other expenses (equipment). Please review the Rules & Guidelines for more guidance. Indirect costs are not allowed under GCE Phase I.

Debbie Frank
Use this section to briefly describe your idea. Read the topic description carefully to make sure that your idea directly fits the topic; otherwise your proposal may be disqualified.

Debbie Frank
Use this section to briefly describe the project design and implementation plan.

Washington University School of Medicine in St. Louis
Department of Obstetrics and Gynecology

Review comments you don't want:

- Very densely written and very ambitious
- A diagram aimed to illustrate the focus of the proposed experiments would have been extremely useful for a much easier comprehension of the hypothesis and proposed mechanisms.
- The study design in Aim 3 is not clear.
- A major concern was the lack of rationale supporting some of the proposed studies

Review comments you do want:

- Very well written experimental plan, with clear presentation of objectives, interpretation, alternative endpoints.
- The experimental approaches are very clearly described.
- The proposal was clear, concise, and provided descriptions that made the grant a pleasure to read.
- Overall, the application is well written and very easy to follow.
- Overall, this is a beautifully written grant.

Questions?

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