

# **“HOW TO WRITE YOUR FIRST GRANT” WORKSHOP AND WRITING TIPS**

**Sponsored by the  
Professional Development Committee of the  
Society for Leukocyte Biology (SLB)**

**Kansas City, September 23, 2011**



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Wright State University School of Medicine  
Dayton, OH**

## **The objectives of this Workshop are:**

- 1 - To present the different types of grants that the NIH offers**
- 2 - To explain the components of a grant proposal**
- 3 - To provide help on understanding what the reviewers are looking for in each part**
- 4 - To provide useful hints on how to write your first grant**
- 5 - To enumerate a list of resources and useful links to find more information**
- 6 - To answer your specific questions in a small-group setting**

# “HOW TO WRITE YOUR FIRST GRANT” WORKSHOP

## Format:

- **Didactic presentation (~40 min)**

Dr. Julian Gomez Cambroner

- **Round Table groups (~50 min)**

Group Leaders:

- Dr. Lee-Ann Allen (University of Iowa)
- Dr. Julian G. Cambroner (Wright State University)
- Dr. Martha Cathcart (Cleveland Clinic)
- Dr. Louis Justment (University of Alabama)
- Dr. Elizabeth Kovacs (Loyola University Chicago)
- Dr. Kenneth R. McLeish (University of Louisville)
- Dr. William Nauseef (University of Iowa)

# FIRST OFF...

- This is a session to help, as part of the educational mission of the Society for Leukocyte Biology and its “Professional Development Committee”, aimed at our fellow Junior Scientists.
- All the information presented here is of general nature and intended only to help... absolutely no claims or guarantees about obtaining success are made!!!



Several granting agencies exist but,  
because of the panel current expertise,  
**we will focus today on NIH RESEARCH**

- **INTRAMURAL RESEARCH:**

Performed at NIH by NIH staff at Research laboratories, Clinical Center, etc. (Accounts for ~10% of NIH budget)

- **EXTRAMURAL RESEARCH:**

Funded by NIH but performed through grants and contracts at academic institutions (accounts for ~80% of NIH budget)



# GRANT TYPES

- Research Project Grants (**R**)
- Research Fellowship Awards (**F**)
- Institutional Training Grants (**T**)
- Program Project and Center Grants (**P**)
- Career Development Awards (**K**)

# NEW INVESTIGATOR

- You can apply to R21, R13, F15, etc., or RO1s taking advantage of that status
  - Once you get your first RO1, you are no longer considered a “new investigator”
- Advantage #1: applications are reviewed together (rather than comparing them to senior investigators)
  - Advantage #2: a slightly better pay-line cutoff



# TRAINING GRANTS (T, F)

- Institutional Training Grants T32
- Individual Training Grants National Research Service Awards (NRSA):
  - F30 - MD/PhD Student
  - F31 - PhD Student
  - F32 - Postdoctoral Trainee



# CAREER DEVELOPMENT (K)

## - Mentored Career Development:

K01: Mentored Scientist Development

K08: Mentored Clinical Scientist

K23: Mentored Patient-Oriented

K25: Mentored Quantitative Research

**K99/R00: Pathway to Independence**

## - Established Investigators:

K02: Independent Scientist Development

K07: Academic Career Award

K12: Mentored Clinical Scientist Program

K24: Mid-Career Patient-Oriented Research

**<http://grants.nih.gov/training/careerdevelopmentawards.htm>**

# RESEARCH PROJECT GRANTS (R)

## - R03: Small Grant

Pilot project

No prelim. data necessary (but it helps to have it!)

Limited time and funding

## - R21: Exploratory/Developmental Grant

High risk/high yield

Limited time and funding

No prelim. data necessary (but it helps to have it!)

## - R01: The Basic Research Grant

Single project

New and established investigators

# MORE ON R21s

- Exploratory/Developmental Grant Applications:
  - Provides support for the early stages of project development in investigator-initiated research.
  - May sometimes be used for pilot and feasibility studies.
  - Limited to up to two years of funding.
  - Combined budget for direct costs for the two year project period usually may not exceed \$275,000. No more than \$200K may be requested in a single year.
  - Preliminary data **are generally not required, but may be included if available** if available. (please do!)

# MORE ON R01s

## - Investigator-Initiated Research Project Grant

- Provides funding to support investigator-initiated research on a specified, project, in an investigator's area of interest and competency.
- **NIH's most commonly used granting program.**
- No specific dollar limit (unless otherwise specified).
- “Modular” \$250,000 directs/year.
- Advance permission required for >\$500,000 in any year.
- Generally awarded for 3 to 5 years.
- Utilized by all NIH Institutes and Centers.

# RESOURCES

- Your mentors and other investigators
- Peers who have active NIH grants
- Office of Research Services at your institution
- Professional/scientific societies
- Grant writing workshops
- **RePORTER**: Search for already-funded grants by the NIH:
  - <http://projectreporter.nih.gov/reporter.cfm>
- Program staff at NIH
  - **SRO** (Scientific Research Officer)
    - Q's related to assignments and to the scientific review
  - **PO** (Program Officer)
    - Q's related to the Institute and AFTER the review

# THE PEER REVIEW PROCESS

- The Center for Scientific Review (**CSR**) receives all NIH and some other Public Health Service grant applications
- Your application is assigned to a review group and an NIH Institute or Center

>>> You may request in a cover letter with your application that it be assigned to a particular study section or to an Institute

>>> The CSR will try to accommodate your request but can not guarantee that it'll happen (they'll look at the "scientific fit" of your proposal at that study section)

>>> You can check the status of your application at:

<https://commons.era.nih.gov/commons>

# THE PEER REVIEW PROCESS (cont'd)

- Reviewers are identified
- The review meeting (study section) is convened
- The results are released to you
- The assigned NIH Institute or Center takes charge

View the Video! NIH Peer Review Revealed

<http://www.csr.nih.gov/Video/Video.asp>



# THE THREE CYCLES

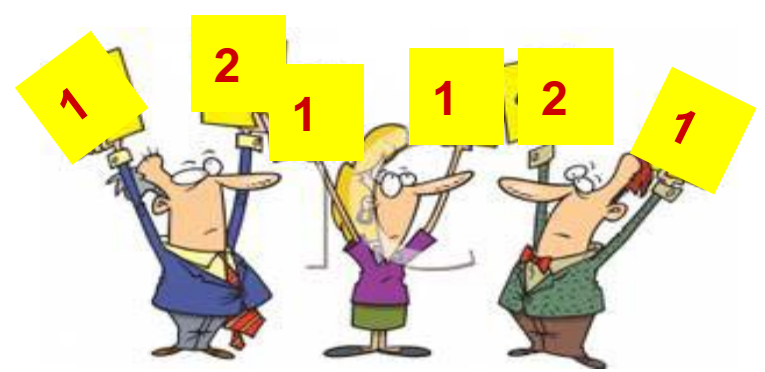
## of regular NIH proposals due dates

- CYCLE I: (NEW RO1s DUE **Feb. 5**)
- CYCLE II: (NEW RO1s DUE **June 5**)
- CYCLE III: (NEW RO1s DUE **Oct. 5**)



- Study section Review  
~3-4 months after
- Council  
~3 more months
- Earliest possible funding  
~2 more months

# SCORING



- The NIH scoring system uses a 9-point scale.
- A score of **1** indicates an exceptionally strong application with essentially no weaknesses. **5** is an average score and a **9** has serious weaknesses with very few strengths.
- Ratings are in whole numbers only (no decimal ratings).

Also, an application could get **a non-numerical score**

## **Not Discussed (ND):**

- Applications unanimously judged by the peer-review committee to be less competitive are not discussed at the peer-review meeting.
- About 50-40% of all applications.
- Do not receive a numerical impact/priority score.
- Applicants DO receive score criteria AND written critiques

# THE 5 CRITERIA SCORES:

- **Significance**
- **Investigator(s)**
- **Innovation**
- **Approach**
- **Environment**

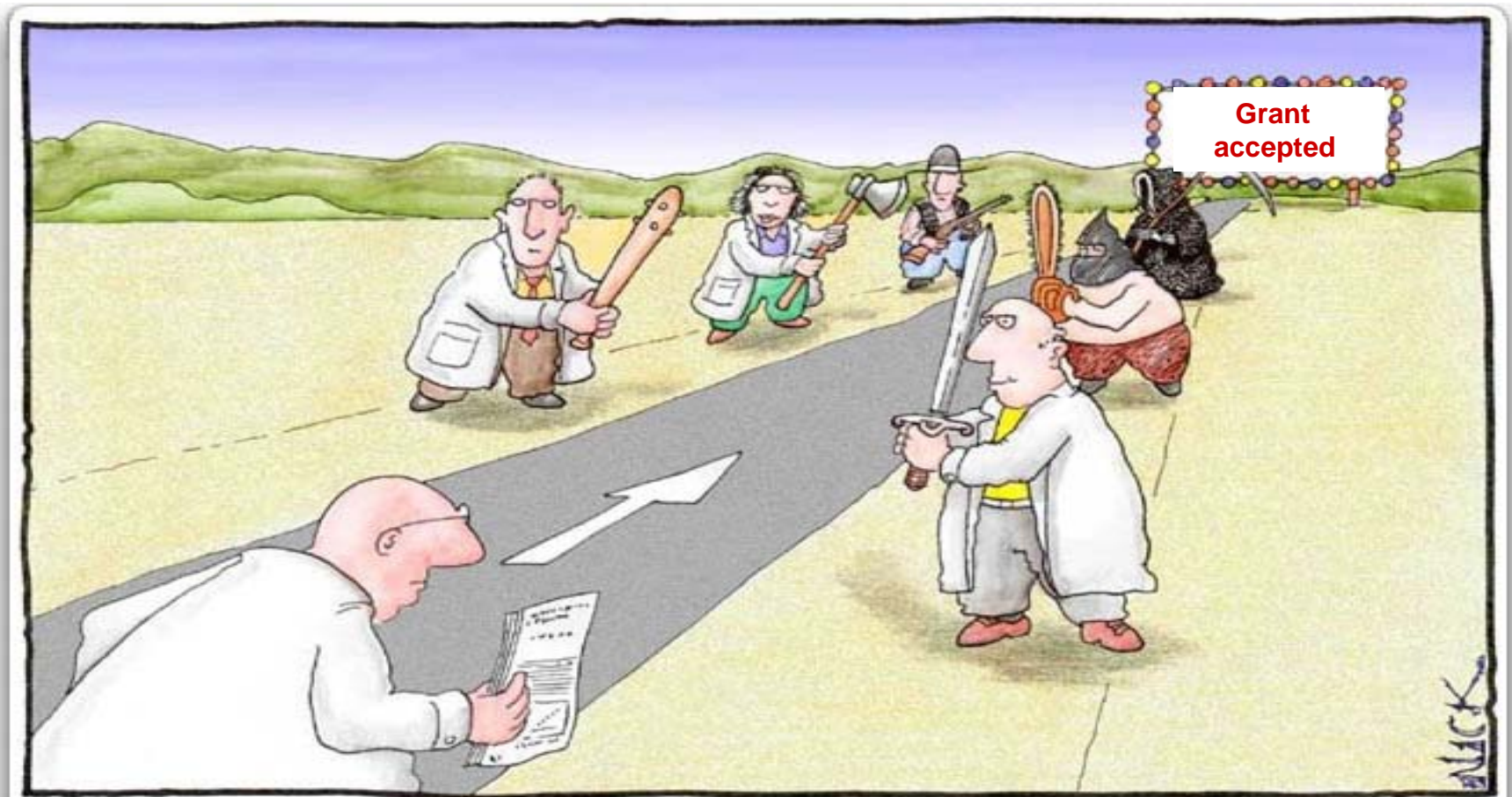


**Other review criteria – human subjects, inclusion, animals, biohazards, resubmission, renewal...**

## **- 1 Overall Impact**

*Special Note: Public health relevance is not a review issue;  
NIH funds basic science*

# THE PEER REVIEW



Most scientists regarded the new streamlined peer-review process as 'quite an improvement.'

# IMPACT vs. SIGNIFICANCE

## IMPACT

- Overall Impact is **NOT** a sixth review criterion **NOR** it is the arithmetic mean of the scores for the scored review criteria.
- It **IS** the integration of the five core review criteria.
- It **IS** an **assessment** of the likelihood for the project to exert a powerful influence on your research field. Reviewers get **hints** from the significance and innovation criteria.

## SIGNIFICANCE

- Significance is one of the **5 evaluation criteria**.
- It is evaluated within the **context** of a research field: **basic research** area (e.g., structural biology) or a **specific disease** (e.g., autoimmune disease).
- There is a great value in indicating that the project will overcome **the critical barrier to progress** in the field.

# IMPACT vs. SIGNIFICANCE (cont'd)

**IMPACT** might be considered as to what the Sponsor *will get for its investment* at the end of the project (hopefully, the field will have been “pushed forward”)

**SIGNIFICANCE** is the collective reviewers’ perception of whether the project is worth doing and important



- A good proposal begins with a **good idea**.
- Rest assured that the reviewers will value positively good ideas.
- Reviewers focus on the “**big picture**” and its potential impact, more than on technical details or grantsmanship.
- They will take into consideration the past impact **record** of the investigator and their **influence** on their fields.

- To consider the Overall Impact, reviewers' have to weigh in several interrelated factors

--- A proposal could be **technically flawless**, experiments will work, but the addressed issues are perceived as minor... then that will diminish the impact.



INTO THE  
REVIEWER'S MIND...

---- A proposal could be using **tried and true techniques** not particularly innovative... but it could still be valued if without doing this work, it is difficult to advance the field.

--- A proposal could be **highly significant**, but somewhat risky, however, the reviewers may perceive it as potentially transformative to the field even if only part of the project succeeds.

# ANATOMY OF A GRANT PROPOSAL: RESEARCH PLAN COMPONENTS

- Introduction (for revised applications only)
  - Specific Aims
  - Background and Significance (\*)
  - Preliminary Studies/Progress Report (\*) *Research Strategy* (\*)
  - Research Design and Methods (\*)
  - Inclusion Enrollment Report
  - Progress Report Publication List
  - Human Subjects Sections:
    - Protections, women/minorities, enrollment, children.
  - Other Research Plan Sections:
    - Animals, select agents, MPI, consortium, support, resource sharing
- Get the correct forms at: <http://grants.nih.gov/grants/forms.htm>

# SPECIFIC AIMS

- The most important page (make it or brake right there: there is no place for a “second” first impression)
- Include the impact that the results of the proposed research will exert on the research field involved.
- List the specific objectives of the research proposed, such as:
  - Test a stated hypothesis
  - Create a novel design
  - Solve a specific problem
  - Challenge an existing paradigm or clinical practice
  - Address a critical barrier to progress in the field
  - Develop a new technology

**Innovation!!!**

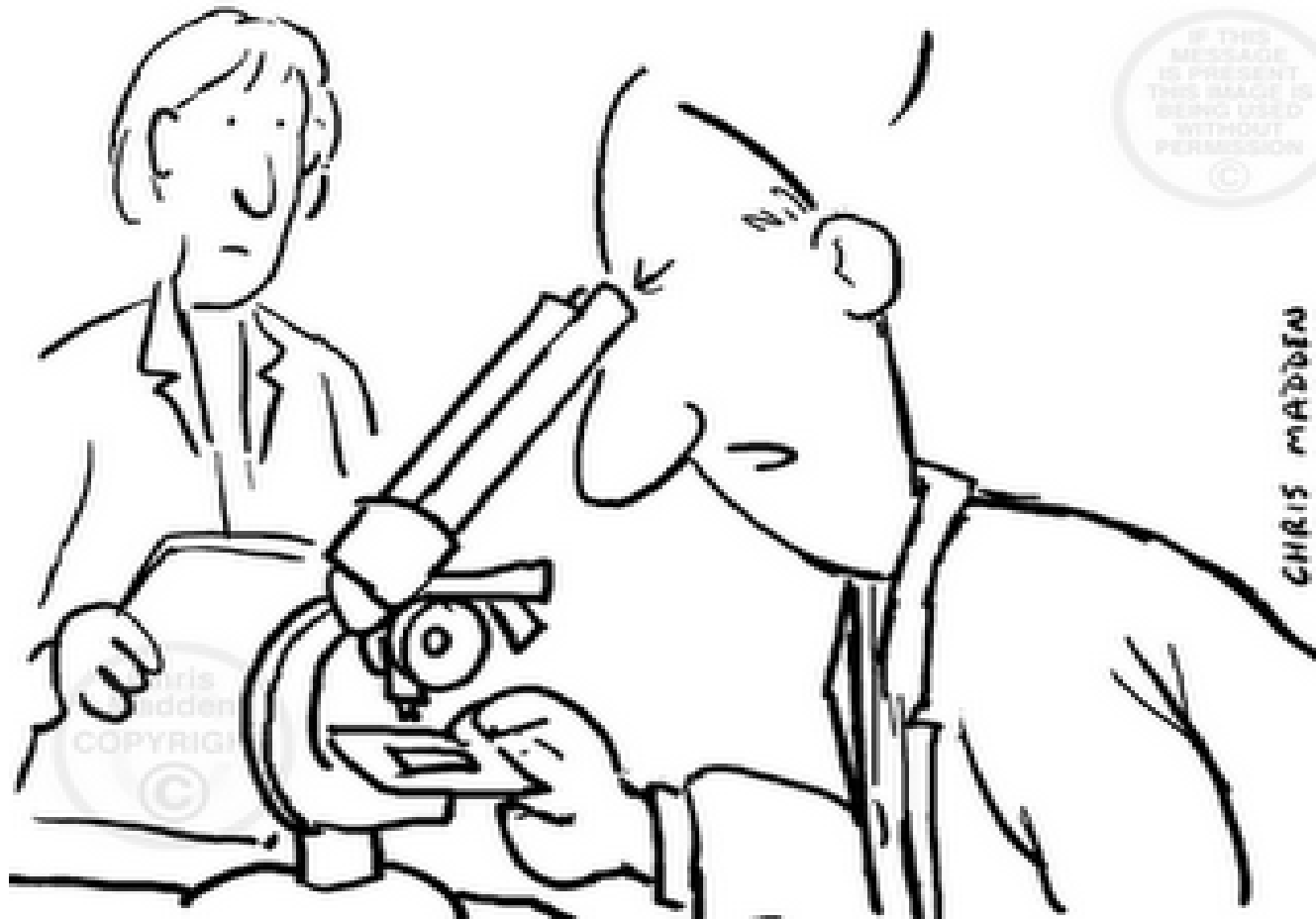
# INNOVATION

- Explain how the application **challenges** and seeks to shift **current research** or clinical practice paradigms.



- Describe any novel theoretical **concepts**, approaches or **methodologies**, instrumentation or interventions to be developed or used, and any advantage over existing ones.
- Explain any refinements, **improvements**, or new applications of theoretical concepts, approaches or methodologies, instrumentation or interventions.

IF THIS EVIDENCE IS CORRECT IT'LL  
ROCK THE VERY FOUNDATIONS OF OUR  
RESEARCH GRANT APPLICATION



# BIOGRAPHICAL SKETCH SECTION

## - Personal Statement:

- Your experience and qualifications make you particularly well-suited for your role in the project.

**>>> This is not the place to be shy!!!**

## - Publications (15)

**>>> The reviewers will be considering:**

- If *Early Stage Investigators* or *New Investigators*... then do they have appropriate experience and training?
- If *Established*... then have they demonstrated an ongoing record of accomplishments that have advanced their field?



## WRITINGS TIPS... FROM SOMEONE WHO HAS BEEN WHERE YOU ARE

- Include results that are relevant to the proposed experiments, to show both **feasibility** and how they are **relevant** to the proposal.
- If you have expertise in a particular field, then make sure you **reference your own papers**. If not, provide strong preliminary data showing new results or include **collaborators** who are experts in that field.
- Try to strike a **good balance** between sufficiently high originality (novel methods, cutting edge approaches) and what is already known (**think outside the box, but not too much!**)



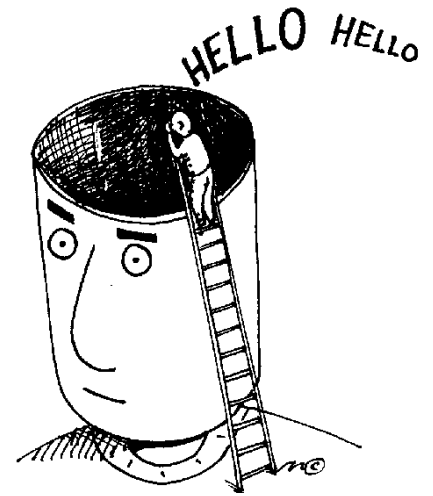
Don't forget to include in your proposed experiments the appropriate **controls** and how you will **analyze** the data  
This is VERY important.



## TIPS (cont'd) On Style:

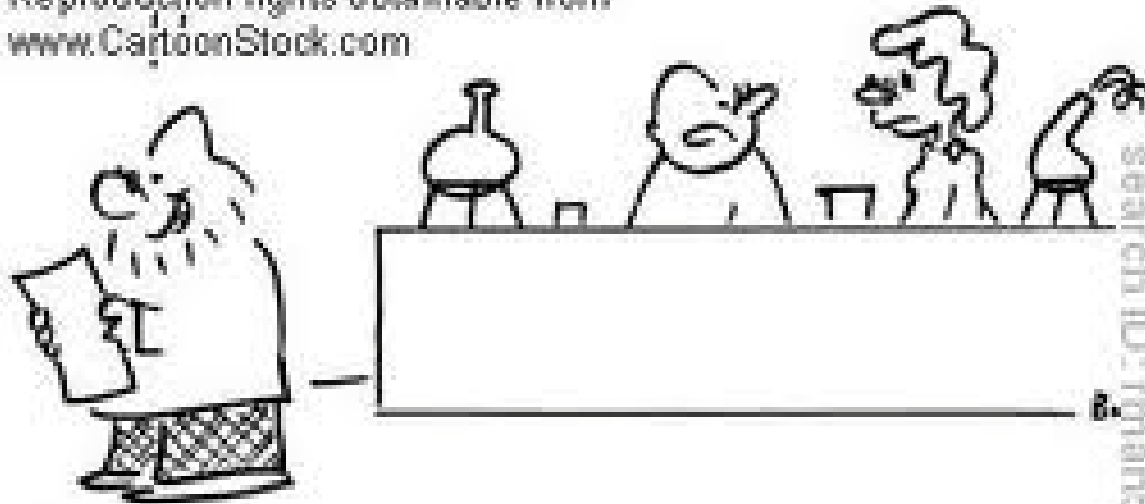
- Use bullets, indentation to highlight words and concepts.
- Use **bold** and underline, but don't overuse them.
- Use diagrams and figures (look for something graphic).
- Pay special attention to **the first sentence** in a given paragraph, as it should convey the whole idea.

# HOW TO LIFT THE DREADED “writers block”



- The more you write, the better.
  - Write EVERY day (even for only 15 min).
  - At the beginning, **keep on writing**, leave blanks... you will fill in later.
  - Brainstorming, OR “focused free-writing”. Try these two exercises:
    - ***What keeps you from writing your proposal?*** Tell the story of yourself, what has happened in the lab for the last 12 months.
    - ***What would be your project?*** jot down the objectives, the resources and then what it is what you want to accomplish.
- >>> **Write spontaneously**, don't worry about form or logic and write fast for 10 minutes.
- >>> Then, the following week, analyze your writing. **You surely will find clues** that were in your brain all the time, and now you can use to focus your ideas.

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"You've got to hand it to Mandelbari  
— He got a Nobel Prize for writing  
grant applications."