“The Grant Proposal Pathway”

• **Hypothesis**: Understanding what happens to a proposal between the time it is submitted and a funding decision is made will improve the chance of funding success.

• **Specific Aims**: Identify –
  – 1) How a grant is reviewed
  – 2) Who are the reviewers
  – 3) What are the reviewers looking for
Your Grant

NIH or Other Funding Agency

months later...

“Pink Sheet”

Critique and Funding Decision
Your Grant

NIH or Other Funding Agency

months later..

“Pink Sheet”

Critique and Funding Decision

Let’s look inside the Black Box!
NIH Organization?

- **Director’s Office** – sets policies, represents NIH to Congress, public, has modest discretionary $, etc.

- **Institutes and Centers (I/C’s)** – *(Congress puts grant $$$ Here)*
  - Each has focus, e.g., NCI, NIGMS, NEI, NHBLI, etc.
  - Develop Specific Programs and Priorities
  - *Award Grants*

- **Center for Scientific Review (CSR)** – special function to review grants via *study sections* (sometimes call Scientific Review Groups or SRG’s; Initial Review Groups or IRG’s). *No grant $$ to distribute*
### National Institutes of Health

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<th>Institute</th>
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<tr>
<td>National Institute on Aging</td>
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<td>National Institute on Alcohol Abuse and Alcoholism</td>
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<td>National Institute of Allergy and Infectious Diseases</td>
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<td>National Institute of Arthritis and Musculoskeletal and Skin Diseases</td>
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<td>National Cancer Institute</td>
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<td>National Institute of Child Health and Human Development</td>
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<td>National Institute on Deafness and Other Communication Disorders</td>
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<td>National Institute of Dental and Craniofacial Research</td>
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<td>National Institute of Diabetes and Digestive and Kidney Diseases</td>
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<td>National Institute on Drug Abuse</td>
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<td>National Institute of Environmental Health Sciences</td>
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<td>National Eye Institute</td>
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<td>National Institute of General Medical Sciences</td>
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<td>National Heart, Lung, and Blood Institute</td>
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<td>National Human Genome Research Institute</td>
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<td>National Institute of Mental Health</td>
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<td>National Institute of Neurological Disorders and Stroke</td>
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<td>National Institute of Nursing Research</td>
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<td>National Institute of Biomedical Imaging and Bioengineering</td>
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<td>National Center for Complementary and Alternative Medicine</td>
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<td>Fogarty International Center</td>
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<td>National Center for Research Resources</td>
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<td>National Library of Medicine</td>
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<td>National Center on Minority Health and Health Disparities</td>
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CSR has Many Study Sections, e.g.

- Arthritis, Connective Tissue, and Skin
- Auditory System
- Membrane Biochem. & Biophysics
- Biomaterials
- Cancer Genetics
- Cellular Signaling & Regulatory Systems
The Grant Pathway

NIH = National Institutes of Health

Two Assignments Made

1. CSR - Study Section that oversees scientific review and Assignment of Priority Score
2. Institute ($$) that makes Final Funding Decision
3. Scientific Review & Priority Score
4. $$$ to Texas!
Relationship of Study Sections (Scientific Review) to Institutes ($$)

~200 Study Sections -- CSR

- Biochemistry
- Clinical Oncology
- Genetics
- Epidemiology of Cancer
- Lung Injury, Repair
- Microbial Physiology
- Oncological Sciences
- Etc.

~ 20 Institutes

- NCI
- NEI
- NIDDK
- NIGMS
- NHBL
- Etc.

1) Scientific Review is Done by Study Sections
2) Funding Decisions made by Institutes
How does the Study Section Operate?

- SS has 15-25 members (regular & ad hoc) selected for their expertise in the area of the applications the study section reviews and is overseen by a Scientific Review Officer.

- Scientific Review Officers (SRO) oversee individual SS’s; receive applications from CSR main office and assign each application to primary & secondary reviewers before the review meeting.

- Primary & Secondary Reviewers prepare written reviews and post in advance on NIH website.

- All SS members meet to review all grants:
  - Chair runs meeting (not NIH employee)
  - SRO serves as a ‘resource’ about policy & protocol.

- Study Sections are far more diverse than one might anticipate.
• **Cellular Signaling and Regulatory Systems Study Section**

• The Cellular Signaling and Regulatory Systems (CSRS) study section reviews applications that focus on the initiation and execution of programs that control cellular homeostasis and physiology. A distinguishing characteristic of these applications is an emphasis on signaling networks and the coordination of processes related to cell proliferation, survival, and growth.

• Cell cycle regulation, mitosis, meiosis, checkpoint controls, regulation by ubiquitination

• Proteolytic mechanisms associated with cell cycle, senescence and death

• Programmed cell death and apoptosis, particularly their regulation in the context of stress, growth, and transformation.

• Proliferation & growth control by the nucleus; pathways regulating transcription

• Integrative cell physiology, e.g., stress, clocks, cellular modeling; cell differentiation and transformation

• Basic studies of cytokine signaling

• Application of state-of-the-art technologies such as imaging and computational modeling of cellular signaling networks
The primary and secondary reviewers will:

1) read your proposal thoroughly (you hope!) and hopefully understand it
2) evaluate it (priority score),
3) explain it AND justify their evaluation to the study section,
4) prepare a written summary and evaluation.

They present to the full study section (~15-20 people) most of whom will not have read the complete grant. After discussion, every member gets an equal vote.

50-100 grants in 2 days – You must be clear and to the point!!
(1) Get peer review from critical colleagues: EARLY and OFTEN!!

(2) Write different sections of the grant for ‘different’ reviewers; ask different types of colleagues to review proposal

(3) Grant must be crystal clear and explicit! Page limits make this critically important. (How long should one plan to write?)
Peer Review
Is Critical!!

"I think you should be more explicit here in step two."
The Study Section Assigns a Priority Score

<table>
<thead>
<tr>
<th>Impact Score</th>
<th>Overall Impact Score</th>
<th>Guidance on weighing strengths and weaknesses</th>
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<tbody>
<tr>
<td>High Impact</td>
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<tr>
<td>1</td>
<td>Exceptional</td>
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<tr>
<td>2</td>
<td>Outstanding</td>
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<tr>
<td>3</td>
<td>Excellent</td>
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<tr>
<td>Moderate Impact</td>
<td></td>
<td></td>
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<tr>
<td>4</td>
<td>Very Good</td>
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<td>5</td>
<td>Good</td>
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<tr>
<td>6</td>
<td>Satisfactory</td>
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<tr>
<td>Low Impact</td>
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<tr>
<td>7</td>
<td>Fair</td>
<td></td>
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<tr>
<td>8</td>
<td>Marginal</td>
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<tr>
<td>9</td>
<td>Poor</td>
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Non-numeric score options: **NR** = Not Recommended for Further Consideration, **DF** = Deferred, **AB** = Abstention, **CF** = Conflict, **NP** = Not Present.
Priority Scores and Percentile Rank

• Priority Scores assigned by Study Sections based on average of all reviewers scores
• Percentile Rank assigned afterwards to normalize scoring across study sections and over time
• Funding determined by percentile rank
1) Study Section Review

Approved Applications  
Assigned Percentile Scores

1st John Doe (Biochem. SS)  
2nd Your Grant (Oncology SS)  
13th Stancel (Genetics SS)  
27th Jane Doe (Micro. SS)  
Etc.

Not Recommended for Further Consideration (a.k.a. “Streamlined”, “Nerfed”)

2) Institute Funding Decision

National Cancer Institute  
(Budget from Congress)

Payline

1) Your Grant  
2) John Doe  
3) Stancel  
4) Jane Doe  
Etc.  
Etc.  
Etc.
The Institute’s Council may make some changes in the rankings based upon their particular goals and needs.

“We have plenty of good grants on magic potions, but we need at least one good grant on curing evil spells!”
Grant Contacts, Interactions, and Information in Various Phases

• **Pre Submission**: *Institute* Program Officials
  – Assess Institute’s Interest in Your Proposal
  – Provide Advice & Potential SS Assignment

• **Submission – Review**: *CSR’s* Scientific Review Officers (SRO’s) who oversee study sections
  – Questions about application
  – Submitting additional information

• **Post Award**: Assigned Program Officer at Funding *Institute*

• **NEVER CONTACT A STUDY SECTION MEMBER ABOUT YOUR GRANT!!!**
Help your proposal be assigned appropriately
- You can Recommend Assignments

- Call Institute staff (be respectful) – they want to help so seek information and make suggestions - but don’t argue!
- Study section rosters are public information (‘regular’ members)

Remember – The agency does not care about supporting you as an individual. They only want to fund you if the research you propose helps them achieve one of their objectives.
Important Sources of Information

• NIH Website –
  – general information about types of Grants
  – ‘standard’ information, e.g., general instructions, receipt dates, etc.

• NIH Guide – weekly information about program changes, Request for Applications (RFA’s)

• Institute Home Pages
  – Information about areas of interest
  – Names and Contact information for Program Officers

• Center for Scientific Review Website
  – Detailed information about preparing applications
  – Names and Contact information for Scientific Review Officers
  – Study Section Descriptions and Rosters
  – Instructions for Reviewers!!!
What Happens to Your NIH Grant Application

James Mack, Ph.D.
Scientific Review Officer
NIH Center for Scientific Review

https://public.csr.nih.gov/
Welcome to NIGMS

The National Institute of General Medical Sciences (NIGMS) supports basic research that increases understanding of biological processes and lays the foundation for advances in disease diagnosis, treatment, and prevention.
Your Job as Principal Investigator (PI)

1) Help your proposal be assigned to
   a) The appropriate study section
   b) The appropriate institute

2) Make the primary & secondary reviewers’ jobs easy – they’ll appreciate it and become your advocates.
   a) Give the proposal a focus that helps them understand it
   b) Make it easy for them to read
   c) Make it easy for them to explain it to the study section
   d) Make it easy for them to justify a good evaluation

3) Help the other members of the study section who do not read the entire grant.

NEVER OVERESTIMATE THE REVIEWERS!!!
USE THE FOLLOWING TOOLS – IN ORDER – TO PREPARE YOUR GRANT

1) The Internet to identify
   a) Study section rosters
   b) Institute contact personnel
   c) The Institute’s goals and interests
   d) The Center for Scientific Review for Updates

2) The telephone to
   a) Assess interest in your project
   b) Consider study section/institute assignments

3) The word processor to
   -Actually write the grant!
HELP THE REVIEWERS – When you Write the Grant!

1) Read and *follow your instructions* and know the reviewers’

2) Give the proposal a focus, and have colleagues help you evaluate it (write a novel, not a collection of short stories)

3) Build the application around your focus (the hypothesis or scientific question being addressed)

4) Help the reviewer prepare his/her critique and presentation to the study section (know what he/she is looking for and write it for them - CLEARLY!)

5) Get rigorous, critical review (before you send the grant!)
   a) from “experts”
   b) from well rounded “generalists”
What will reviewers look for in your grant?

Core Review Criteria (in instructions to reviewers on NIH website)

Significance
Investigators
Innovation
Approach
Environment
Innovation

- **Innovation.** Does the application challenge and seek to shift current research or clinical practice paradigms by utilizing novel theoretical concepts, approaches or methodologies, instrumentation, or interventions? 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?

*State **EXPLICITLY** what is innovative about your proposal*
REMEMBER - Reviewers are just like anyone else,

EXCEPT, they have to review your grant in Addition to all their normal work!

Don’t overestimate them, and be certain to help them out!
Don’t Forget…..

• You must be registered in *eRA Commons* to submit applications electronically.

• Individuals do NOT submit or receive grants – institutions do
  - Consult the Sponsored Projects Administration (SPA) well in advance of agency submission dates for their requirements and deadlines.
  - Remember you will need information and approvals (e.g., animal welfare, human subjects, conflicts of interest, biohazards, chemical safety, etc.). Formal approvals may often be “just in time”, but best to check with institutional committees/offices prior to submission.
Get peer review from critical colleagues:
Do It EARLY and OFTEN!!

Never Overestimate the Reviewers

Talk to People at the Funding Agency

And Don’t Ever Forget…..
GOOD LUCK!

And Remember that you can get help from

• Sponsored Projects Administration (SPA),

• Office of Academic and Research Affairs (ARA),

• Dr. Morano’s New Investigator Development Program (NIDP) and “Boot Camp”,

• Institutional Committees, and

• Your Colleagues and Mentors

So don’t hesitate to ask!