Applying for research funding

ERIN HECHT

LAB MEETING 05/01/2024

Where does funding come from?

Government agencies
- NIH, NSF, DoD, etc.

Private foundations
- Wenner-Gren, Leakey Foundation, American Kennel Club, etc.

Private individual donors
- I’m not that well-connected…

Internal university funds
- Startup
- Internal grants

Understanding the Rules of Life: Emergent Networks (URoL:EN)
Predicting Transformation of Living Systems in Evolving Environments

PROGRAM SOLICITATION
NSF 21-560

National Science Foundation

Full Proposal Deadline(s) (due by 5 p.m. submitter's local time):

May 10, 2021

IMPORTANT INFORMATION AND REVISION NOTES

Any proposal submitted in response to this solicitation should be submitted in accordance with the revised *NSF Proposal & Award Policies & Procedures Guide* (PAPPG) (NSF 20-1), which is effective for proposals submitted, or due, on or after June 1, 2020.

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

Understanding the Rules of Life: Emergent Networks (URoL:EN)
Predicting Transformation of Living Systems in Evolving Environments

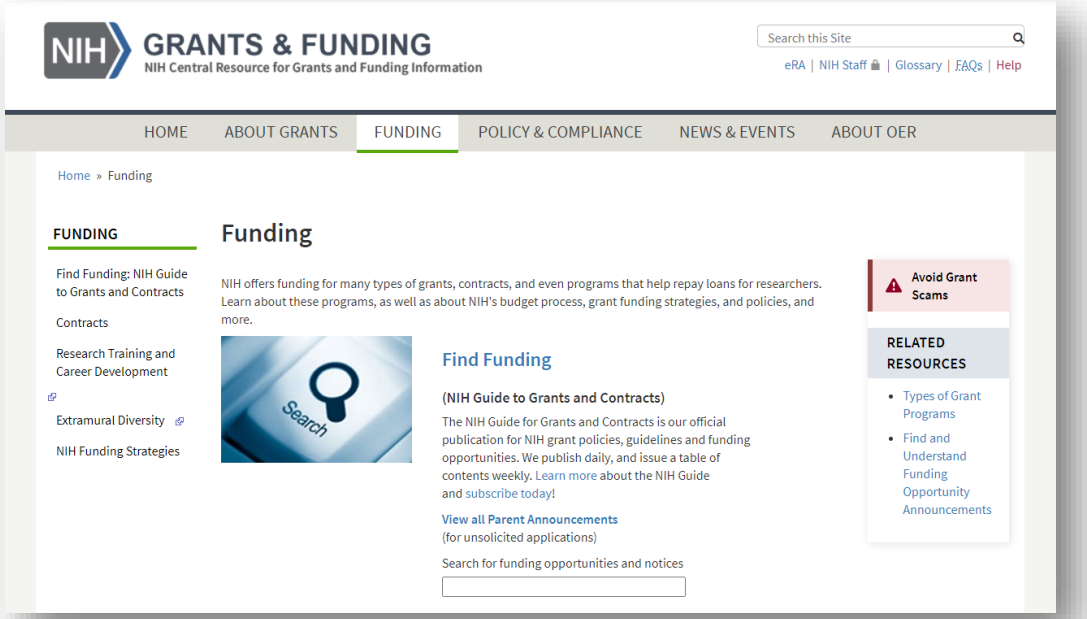
Synopsis of Program:

In 2016, the National Science Foundation (NSF) unveiled a set of "Big Ideas," 10 bold, long-term research and process ideas that identify areas for future investment at the frontiers of science and engineering (see https://www.nsf.gov/news/special_reports/big_ideas/index.jsp). The Big Ideas represent unique opportunities to position our Nation at the cutting edge of global science and engineering by bringing together diverse disciplinary perspectives to support convergence research. As such, when responding to this solicitation, even though proposals must be submitted to the Division of Emerging Frontiers in the Directorate for Biological Sciences (BIO/EF), once received, the proposals will be managed by a cross-disciplinary team of NSF Program Directors.

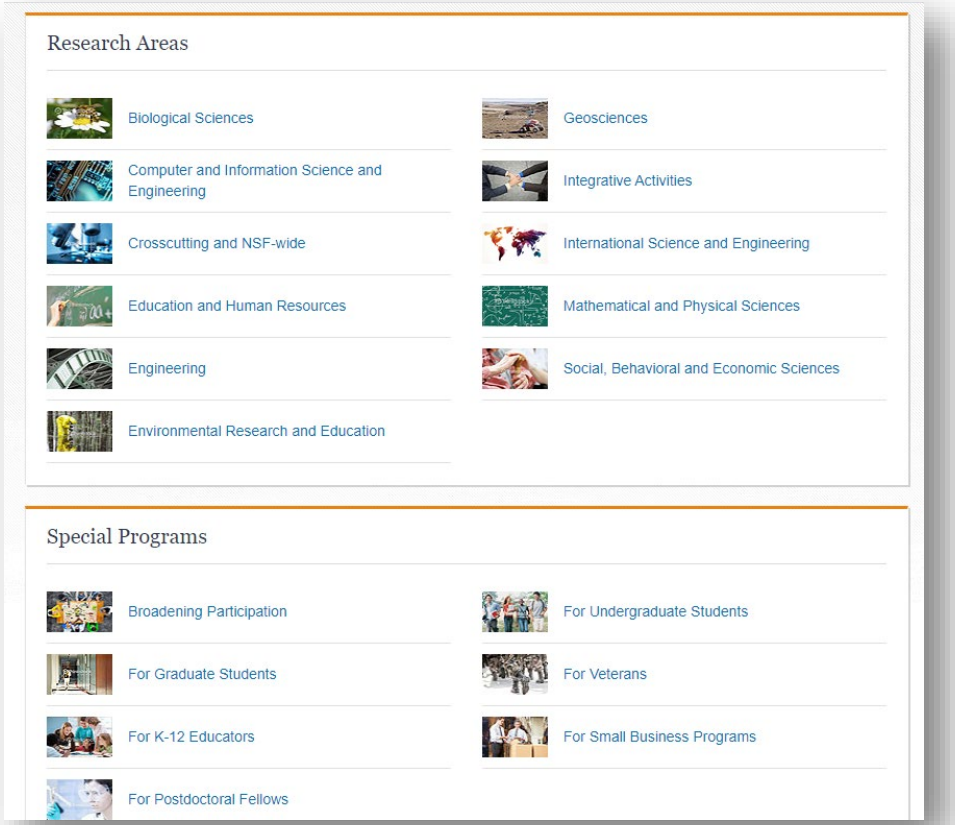
"Program solicitation" = instructions and info for a particular funding opportunity

How to you choose a funding opportunity?

Step 1: Internet search



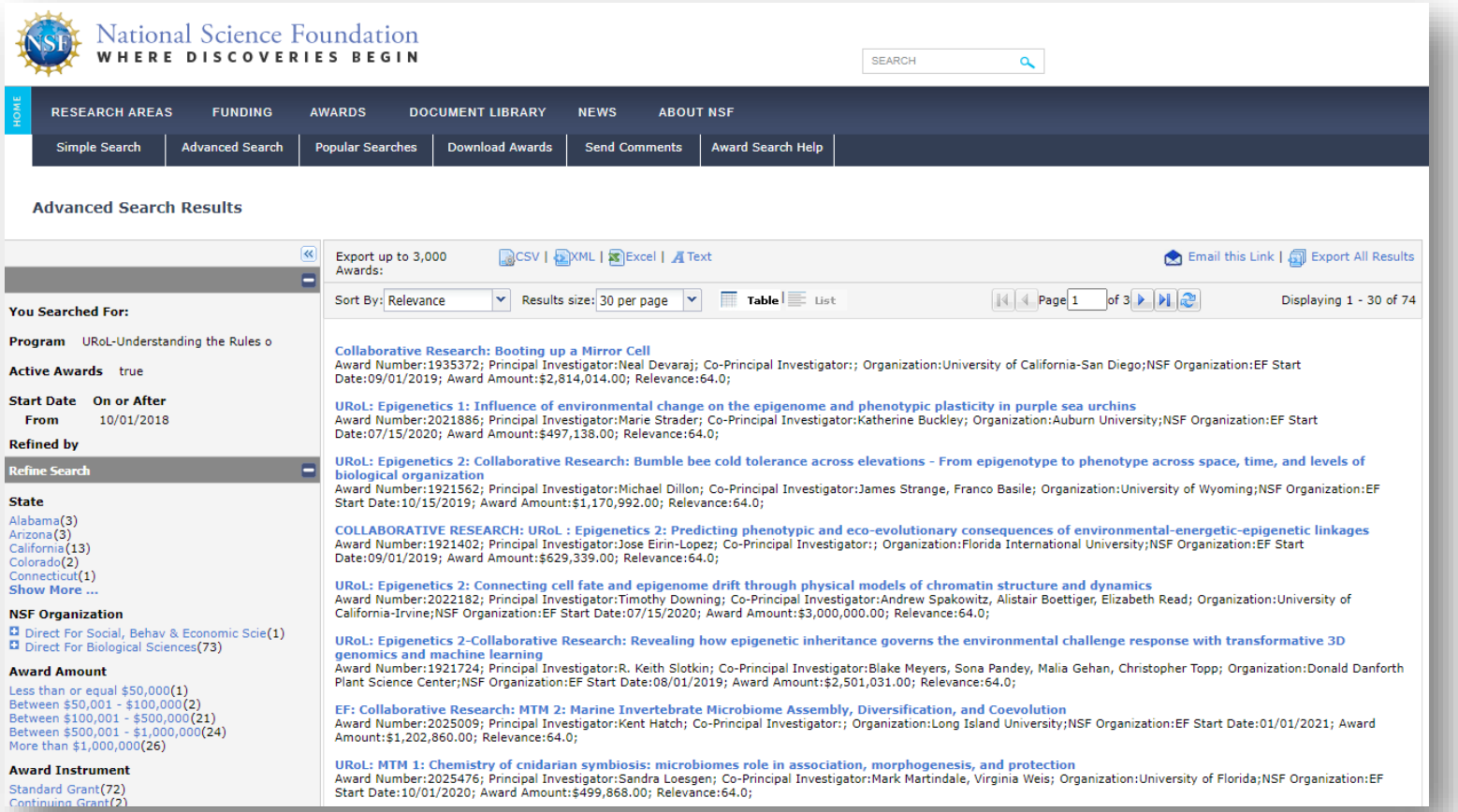
https://grants.nih.gov/funding/index.htm



https://www.nsf.gov/funding/

How to you choose a funding opportunity?

Step 2: Look at what has been funded through that funding opportunity in the past. Is it similar to what you want to do?



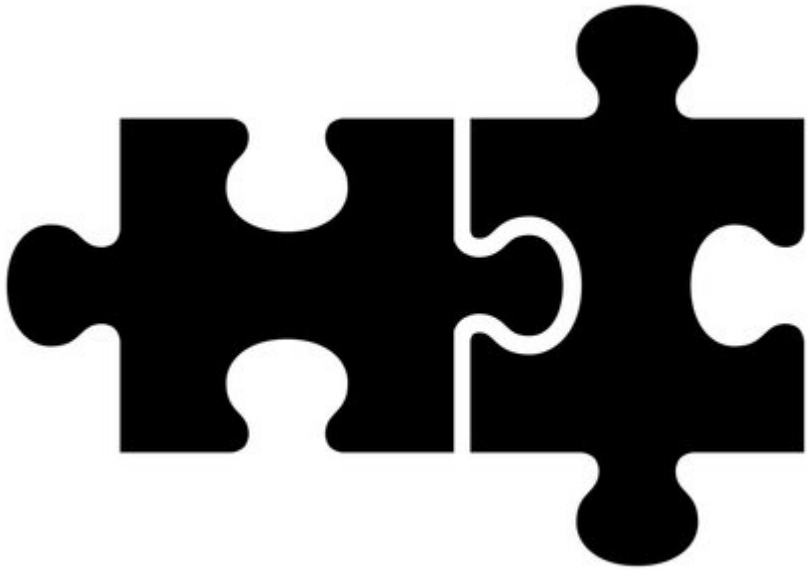
How to you choose a funding opportunity?

Step 3: Talk to program officers about “best fit”

…and, if you can:

- Success rates
- Average grant amount (if variable)
- Any “no go” topics

OK to ask them to refer you to a more relevant division/program!



What types of funding opportunities exist?

Trainee grants: Grad and postdoc fellowships

- NSF DDRIG/GRFP, NIH NRSA, Marie Curie, Fyssen

Transitional grants: Postdoc-to-faculty “career development”

- NIH K-series: https://researchtraining.nih.gov/programs/career-development

PI grants: Faculty*

- Some provide only research funds (often private foundations & internal university grants)
- Some provide research funds + salary (government agencies)
- May be collaborative (multi-lab); one person is the lead PI

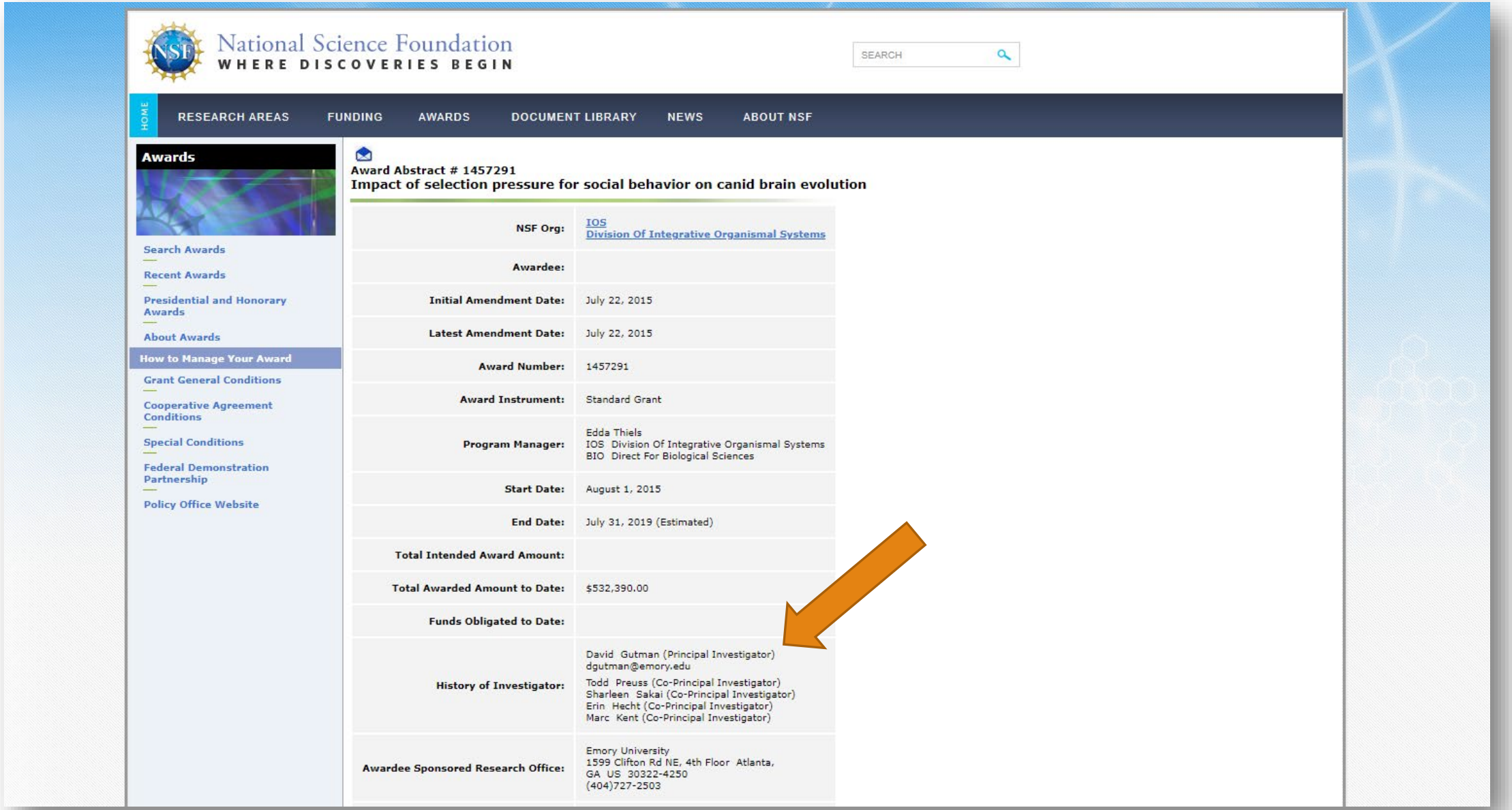
* 2 side notes… Who can be a PI on a grant? Where does salary come from after grad school?

Who can apply as PI?

Most universities: tenure-track faculty or others with a (semi) “permanent” position

Some universities: also non-tenure-track faculty, postdocs, and/or grad students

→ Why do universities restrict PI rights?


National Science Foundation
WHERE DISCOVERIES BEGIN
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Presidential and Honorary Awards
About Awards
How to Manage Your Award
Grant General Conditions
Cooperative Agreement Conditions
Special Conditions
Federal Demonstration Partnership
Policy Office Website
Award Abstract # 1457291
Impact of selection pressure for social behavior on canid brain evolution
NSF Org: IOS Division Of Integrative Organismal Systems
Awardee:
Initial Amendment Date: July 22, 2015
Latest Amendment Date: July 22, 2015
Award Number: 1457291
Award Instrument: Standard Grant
Program Manager: Edda Thiels IOS Division Of Integrative Organismal Systems BIO Direct For Biological Sciences
Start Date: August 1, 2015
End Date: July 31, 2019 (Estimated)
Total Intended Award Amount:
Total Awarded Amount to Date: $532,390.00
Funds Obligated to Date:
History of Investigator: David Gutman (Principal Investigator) dgutman@emory.edu
Todd Preuss (Co-Principal Investigator)
Sharleen Sakai (Co-Principal Investigator)
Erin Hecht (Co-Principal Investigator)
Marc Kent (Co-Principal Investigator)
Awardee Sponsored Research Office: Emory University 1599 Clifton Rd NE, 4th Floor Atlanta, GA US 30322-4250 (404)727-2503

Why does being listed as PI matter?

Who makes decisions about spending and research activities?

Who gets credit for “getting” the grant?

Who continues this line of research in the future?

Responsibilities of grant PI during submission

- → Coordinate all the paperwork – be on top of everything, know what is needed when, etc. (Jenna can help)
- → Coordinate among co-PI's / co-contributors – who is doing what, and when. Clear communication is key
- → Share final grant with all co-PI's / co-contributors, and get their approval before submission
- → (Just like being corresponding author on a manuscript!)

Responsibilities of grant PI after award

From the funding agency's perspective, unless it is a mentored grant (fellowship), the grant PI…

- makes hiring/firing decisions
- makes spending decisions, including how funds are allocated to people in the lab
- manages the budget, record-keeping, and total expenditures
- is responsible for all reporting and compliance (including IACUC and IRB)
- …and is the party who can be held responsible, barred from future funding, and even fired, if any of those things go egregiously wrong

From the university's perspective, the head of the lab is actually the person who holds all of those responsibilities (for obvious reasons)

What goes into the grant?

"Route" to Office of Sponsored Programs (OSP) well before due date

** Note: the university (OSP) applies for the grant (not you!)*

- List of personnel: PI, co-PI's, postdocs, staff, students, RA's…
  - Biosketches for all senior personnel (faculty and postdocs)
  - Some non-senior personnel might be "to be hired" or "to be named"
- Amounts and dates of current and pending support for all senior personnel
- Budget and budget justification
- Facilities, equipment, and other resources
- Training plan for postdocs
- Data management plan

Upload a few days before due date

- Project description (i.e., the actual science)

Project description

Aims (generally 1 page)

Introduction/background: Why is this an important question? What is known so far?

Preliminary data

Approach/methods: What will you actually do?

Impact/significance: What will this add to the field?

Future directions, potential problems & alternative approaches,etc

NSF: Broader impacts (education, outreach, applications)

References

What does the process look like?

Idealized version:

Decide what research you want to do

Find funding agencies that provide money for that kind of thing

Write an application

Receive reviews

Revise and resubmit

Get money

What does the process look like?

Reality is a bit different…

Decide what research you want to do

What research *can* you do? How do you make what you *want* to do fundable?

Find funding agencies that provide money for that kind of thing

This might come first!

Write an application

Or partially recycle an old one (LPT)

Receive reviews

Sometimes grant not even scored

Revise and resubmit

Get money

Most commonly: nope

THE MOST COMMON OUTCOME IS FAILURE

EVEN IF YOUR GRANT IS BRILLIANT

SOMETIMES, EVEN IF THE REVIEWERS LOVE IT!

→ NOT GETTING FUNDING IS A HUGE PART OF GETTING FUNDING

Tweet

Andrew Iwaniuk
@AndrewIwaniuk

These get posted quite a bit, but I still think sharing a cv of failures with our students is important. Mine has plateaued a bit lately, but only due to a lack of motivation on my part. #AcademicChatter #AcademicTwitter

Rejected grant applications

2018	Australian Research Council
	National Science Foundation
2017	Australian Research Council
	National Science Foundation
	Human Frontiers Science Program
2016	U.S. Department of Energy
	Australian Research Council
2015	Canada Foundation for Innovation
	Australian Research Council
2014	Human Frontiers Science Program
	Australian Research Council
2013	Australian Research Council
2010	Human Frontiers Science Program
	Smithsonian Institution-University of Maryland Grant
	National Science Foundation
2009	NSERC Northern Research Supplement
2008	National Science Foundation
2007	Alberta Heritage Fund for Medical Research
	Environment Canada
2006	Alberta Heritage Fund for Medical Research
2004	Alberta Heritage Fund for Medical Research
2001	Animal Behavior Society
	American Ornithologists' Union
	Frank M. Chapman Memorial Fund
1998	Alberta Heritage Fund for Medical Research

Faculty @ HEB (2019-2021)

~~NSF Integrative Organismal Systems – in prep~~ → NSF CAREER
NSF Neural and Cognitive Systems - FRONTIERS
NSF Brain & Cognitive Systems - Science of Language and Augmented Intelligence (PI: Elizabeth Spelke)
NIH - Transformative Research Award (PI: Kelly Lambert)
Dean's Competitive Fund, Harvard University
Army Research Office, Department of Defense
NSF Neural and Cognitive Systems FOUNDATIONS (PI: Stout)
NSF IIBR (PI: Gutman)

Research scientist (~2015-2019)

NIH/VA award (PI: M. Pardue) - successful, but Harvard didn't let me keep it!
NSF NeuroNex
→ → NSF Neural & Cognitive Systems
Georgia State University Brains and Behavior Program Seed Grant
Emory University Research Committee Seed Grant
Human Frontiers Science Program

Post doc (~2012-2015)

The Wenner-Gren Foundation (PI: E. Hecht; Co-PI: T. Preuss)
→ → NSF Integrative Organismic Biology (successful after one resubmission)
Helen Hay Whitney Foundation postdoc fellowship
NIMH K99-R00 (application torpedoed *before* submission)
NIH Human-Animal Interaction
NIH RDoC R03
Leakey Foundation Post-PhD grant (x2)

Grad school (~2006-2012)

NIH NIMH R21 (two resubmissions)
NIH Director's DP5 Early Independence Award
NIMH/NIH Predoctoral NRSA F31 MH086179-03 (successful after 2 resubmissions)
Wenner Gren Foundation Dissertation Fieldwork Grant & Osmundsen Initiative Award
Leakey Foundation Predoctoral Fellowship
NSF Predoctoral Fellowship

In the past 3 years

Star-Friedman (Harvard Internal)
NSF EDGE
Simons Foundation
Mathers Foundation
Aramont (Harvard Internal)
Dean's Competitive Fund (Harvard internal)
Waltham Foundation
NSF NCS Foundations
Sloan Foundation
Milton Fund (Harvard Internal)
NSF CAREER
NSF Biological Anthropology
Dean's Competitive Fund (Harvard internal)
NICHD R34 (with Olivia)
NIH BICAN
Dean's Competitive Fund (Harvard internal)
NSF Major Research Instrumentation
Human Frontiers Science Program
APDT (with Julia)
ASPCA (with Julia)
NIGMS MIRA

Hit rate: 16/33 grants, about 50%
(I think this is above average)

Failure is the most common outcome, even when you are successful!

Pointers for success?

Talk to the program officer

- They will often discuss a 1-pg summary with you
- Specific questions that are OK: Responsive to solicitation? Budget & duration? Factors that are an “automatic fail”?

Simple logical structure

- Lead readers down a “garden path.” Format accordingly
- Propose LESS, write LESS. K.I.S.S.
- Make sure any (non-noise) outcome is interpretable

Compelling graphics

- Schematic overview on aims page
- Methodological diagram for aims (samples, steps, etc)
- Make preliminary data look pretty and polished

+ use phrases from the solicitation in the application

Holy grail

All possible experimental outcomes fall into two or three mutually-exclusive categories

Each of those categories has distinct implications for answering the research question

You can explain this in a concise and straightforward way

And you can make it seem like the program solicitation was written with your proposal in mind

Things to avoid

Confusing, overwhelming, or otherwise ticking off the reader

- Remember, your grant may be one of a dozen, which they are reading while a screaming 2-year-old is dumping orange juice on the dog and their department chair is asking for a favor and their own grant has just been rejected and…

Interdependent aims

- There should be no “domino effect” possible if one aspect of the plan derails

Designing experiments to show X

- What if X isn’t actually true? Will you have negative results? The whole thing is now a wash?

Exploratory research (so I’ve been warned?)

- I do propose exploratory research in my grants. But I frame it around a hypothesis, and state that I’m collecting the data in a way that will enable data-driven, unbiased analysis.

How does the review process work?

NIH: Center for Scientific Review (external agency) organizes review groups (study panels)

- You may be able to submit to a specific study panel (you can discuss this with NIH people)
- 2-3 members of the study panel read your application closely
- 1 member is the “lead reviewer” who organizes discussion
- All members, including others beyond these 3, vote on a score
- Funding is assigned in large part based on this score
- Some investigators may be prioritized

NSF (& private foundations): reviewers are drawn from the general academic field

- You can specify preferred/non-preferred reviewers (devote actual thought to this)
- For NSF, you must also supply a list of people for whom reviewing your grant would be a COI
- 2-3 reviewers supply in-depth reviews
- NSF program officers have considerable discretion on funding decisions. Military, even more.

Receiving your reviews

I read reviews at the end of the day – preferably the end of the week… then walk away

Revision strategy: address everything so thoroughly that it's difficult for them to justify not awarding.

Great! You're funded. Now what?

Wait… about 6 months… before the money actually arrives

Progress reports: annual updates on research activities and output

Final report: what was accomplished in the lifetime of the grant (trainees, papers,etc)

No-cost extension: spend existing money after project period has ended

Think about the next grant before this one runs out

Where does the money actually go?

#1: to the university

- "Indirect costs" = facilities, computing, administrators, etc.
- Rate is negotiated every few years between university & federal government (Harvard FAS: 69%)
- Budget accordingly
- If your grant doesn't include indirect costs, you have to pay the university from other funds!

#2: salaries

- For hard-money positions (like me), can be one or more optional "summer months" of salary
  - For soft-money positions, you HAVE to cover some portion of your salary through grants
- For postdocs, other staff, etc., can be some % of your "full-time employment" (FTE)
- "Fringe" = percent of salary on top of actual pay that goes to health insurance and other benefits (for faculty, 23.6%)

#3: research costs

- Samples, scans, supplies, core fees, travel, publication fees, etc.

Where does salary come from?

Grad school

- University funds
- External grant to grad program (NIH T31)
- External fellowships awarded to student
- Individual PI's lab funds

Post doc

- Individual PI's lab funds
- External fellowships awarded to postdoc
- Rarely, university funds

Research scientist or other non-TT

- Own grants (more common for research positions – "soft money")
- Department or university funds (more common for teaching positions)
- Other faculty's grants (rare)

Faculty

- University funds ("hard money")
- External grants ("soft money")
- Some combo of both
- This may be negotiable at the point of hiring

Questions?
Things I missed?

Other thoughts, questions, or insights?