OPENING THE DOOR TO THE NIH: SUCCESSFULLY TRANSITIONING TO NIH FUNDING

University of Connecticut
September 13, 2019
AGENDA

SECTION 1: INTRODUCTION TO NATIONAL INSTITUTES OF HEALTH (NIH)

SECTION 2: NIH GRANT MECHANISMS

SECTION 3: REVIEW PROCESS

SECTION 4: COMPONENTS OF A SUCCESSFUL NIH PROPOSAL

SECTION 5: PATHWAYS TO THE NIH
Jaimee Hoefert, PhD
Grants Consultant

Jaimee provides Hanover and its higher education clients with grant reviews and writing support, with a focus on proposals for the National Science Foundation and the National Institutes of Health. Prior to coming to Hanover, Jaimee worked as a bench scientist and accumulated experience writing, critiquing, and assembling grants alongside clients and colleagues. She also has over five years’ experience writing about scientific topics for a lay audience, and leverages that expertise to help researchers create grant proposals that are both compelling and easily understood.
SECTION 1: INTRODUCTION TO NIH
NIH MISSION

To seek fundamental knowledge about the nature and behavior of living systems and the application of that knowledge to enhance health, lengthen life, and reduce illness and disability
The NIH invests nearly $37.3 billion annually in medical research

More than 80% of funding goes to:

- 50,000 competitive grants
- 300,000 researchers
- 2,500 universities, medical schools, and other research institutions in every state and around the world
NIH AGENCY GOALS

- To foster fundamental creative discoveries, innovative research strategies, and their applications as a basis for ultimately protecting and improving health;

- To develop, maintain, and renew scientific human and physical resources that will ensure the nation's capability to prevent disease;

- To expand the knowledge base in medical and associated sciences in order to enhance the nation's economic well-being and ensure a continued high return on the public investment in research; and

- To exemplify and promote the highest level of scientific integrity, public accountability, and social responsibility in the conduct of science.
NIH STRUCTURE

Office of the Director

- National Institute on Aging
- National Institute on Alcohol Abuse and Alcoholism
- National Institute of Allergy and Infectious Diseases
- National Institute of Arthritis and Musculoskeletal and Skin Diseases
- National Cancer Institute
- Eunice Kennedy Shriver National Institute of Child Health and Human Development

- National Institute on Deafness and Other Communication Disorders
- National Institute of Dental and Craniofacial Research
- National Institute of Diabetes and Digestive and Kidney Diseases
- National Institute on Drug Abuse
- National Institute of Environmental Health Sciences
- National Eye Institute

- National Institute of General Medical Sciences
- National Heart, Lung, and Blood Institute
- National Human Genome Research Institute
- National Institute of Mental Health
- National Institute of Neurological Disorders and Stroke
- National Institute of Nursing Research

- National Institute of Biomedical Imaging and Bioengineering
- National Center for Complementary and Alternative Medicine
- John E. Fogarty International Center
- National Center for Advancing Translational Research
- National Library of Medicine
- National Institute on Minority Health and Health Disparities

- Clinical Center
- Center for Information Technology
- Center for Scientific Review
CRITERIA YOU SHOULD MEET BEFORE SEEKING AN NIH RESEARCH PROJECT GRANT

- Hold an advanced degree appropriate to the research
- Have a level of position at which your institution allows employees to apply
- Have a publication record (first or last author) in respected journals or a history of overseeing projects in the field in which you are applying
- Work in institution that has the resources—equipment and lab space—you will need and that has committed space for the project
# NIH Next Generation Researchers Initiative

<table>
<thead>
<tr>
<th>Designation</th>
<th>Eligibility</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early Stage Investigator</td>
<td>A Program Director / Principal Investigator (PD/PI) who has completed their terminal research degree or end of post-graduate clinical training, whichever date is later, within the past 10 years and who has not previously competed successfully as PD/PI for a substantial NIH independent research award. A list of NIH grants that a PD/PI can hold and still be considered an ESI can be found at <a href="https://grants.nih.gov/policy/early-investigators/list-smaller-grants.htm">https://grants.nih.gov/policy/early-investigators/list-smaller-grants.htm</a></td>
<td>ESI applications with meritorious scores will be prioritized for funding.</td>
</tr>
<tr>
<td>New Investigator</td>
<td>An investigator who has not previously received substantial, independent funding from NIH.</td>
<td>NIH Institutes and Centers (ICs) fund New Investigators according to the ICs' programmatic and strategic interests.</td>
</tr>
</tbody>
</table>

ESI applications with meritorious scores will be prioritized for funding.
SECTION 2: NIH MECHANISMS
**NIH TYPES OF AWARDS**

- Award type detailed descriptions: [http://grants.nih.gov/grants/funding/funding_program.htm](http://grants.nih.gov/grants/funding/funding_program.htm)

<table>
<thead>
<tr>
<th>Type of Award</th>
<th>Purpose of Award</th>
</tr>
</thead>
<tbody>
<tr>
<td>R Series - R01, R03, R21</td>
<td>Research</td>
</tr>
<tr>
<td>K Series</td>
<td>Career Development</td>
</tr>
<tr>
<td>T &amp; F Series</td>
<td>Research Training and Fellowships</td>
</tr>
<tr>
<td>P Series</td>
<td>Program Project / Center Grants</td>
</tr>
<tr>
<td>Various Others</td>
<td>Resource Grants, Trans-NIH Programs, and Others</td>
</tr>
</tbody>
</table>
NIH Research Project Grant Program

- Used to support a discrete, specified, circumscribed research project
- NIH’s most commonly used grant program
- No specific dollar amount unless specified in FOA (advance permission required for $500K or more direct costs in any year)
- Renewable
- Generally awarded for 3-5 years
- Two parent FOAs: Clinical Trial Required or Clinical Trial Not Allowed
NIH Small Grant Program

Provides limited funding for a short period of time (2 years) to support a variety of types of projects, including:
- pilot or feasibility studies,
- collection of preliminary data,
- secondary analysis of existing data,
- small, self-contained research projects,
- development of new research technology, etc.

- Direct costs generally up to $50,000 per year
- Not renewable
- Utilized by more than half of the NIH ICs
- Guidelines and expectations differ among ICs
**NIH Exploratory/Developmental Research Grant Award**

- Encourages new, exploratory, and developmental research projects by providing support for the early stages of project development
- Sometimes used for pilot and feasibility studies
- Limited up to 2 years of funding
- Budget no more than $275K in direct costs for 2-year period
- No preliminary data required
- Used by most ICs
- Guidelines and expectations differ among ICs
- Two parent FOAs: [Clinical Trial Required](#) and [Clinical Trial Not Allowed](#)
ADVANTAGES AND CHALLENGES OF COMMON RESEARCH AWARDS

<table>
<thead>
<tr>
<th>Common Mechanisms</th>
<th>Advantages</th>
<th>Challenges</th>
</tr>
</thead>
<tbody>
<tr>
<td>R01</td>
<td>• Available through all ICs</td>
<td>• Preliminary data expected</td>
</tr>
<tr>
<td></td>
<td>• Some advantages for New and ESI investigators</td>
<td>• Need a solid history of funded research</td>
</tr>
<tr>
<td>R03</td>
<td>• No preliminary data required</td>
<td>• Small amount of money</td>
</tr>
<tr>
<td></td>
<td>• Supports pilot studies</td>
<td></td>
</tr>
<tr>
<td>R21</td>
<td>• For high-risk, high—reward studies</td>
<td>• Although preliminary data is not required</td>
</tr>
<tr>
<td></td>
<td>• Technically does not require preliminary data</td>
<td>• a majority of funded projects include preliminary data</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Commonly lower success rates for New and ESI investigators</td>
</tr>
</tbody>
</table>
Career Development Awards (K Series)

- **NIH Pathway to Independence (PI) Award**
  - Provides up to five years of support consisting of two phases
    - I – will provide 1-2 years of mentored support for highly promising, postdoctoral research scientists
    - II – up to 3 years of independent support contingent on securing an independent research position
  - Award recipients will be expected to compete successfully for independent R01 support from the NIH during the career transition award period
- No more than 4 years of postdoctoral research training
- PI does not have to be a U.S. citizen
- Two parent FOAs: [Clinical Trial Required](#) and [Clinical Trial Not Allowed](#)
Career Development Awards (K Series)

- **Mentored Research Scientist Career Development Award**
  - For support of a postdoctoral or early career research scientists committed to research, in need of both advanced research training and additional experience.

- **Independent Research Scientist Development Award**
  - For support of an early to mid-career scientists with research funding, in need of additional protected time committed to research.

- **Research Career Enhancement Award for Established Investigators**
  - Provides either full-time or part-time support for experienced scientists who wish to broaden their research capacities or make changes in their research career by acquiring new research skills or knowledge.
Research Training and Fellowships (T & F Series)

**T32**
- **Ruth L. Kirschstein Institutional National Research Service Award**
- To enable institutions to recruit individuals selected by the program leadership for predoctoral and/or postdoctoral research training in specified scientific areas

**F30/31/32**
- **Ruth L. Kirschstein Individual National Research Service Awards**
  - Predoctoral ([*single*](#) and [*dual degree*](#))
  - [Postdoctoral](#)

**F33**
- **Senior Fellows**
- Provides opportunities for experienced scientists to make major changes in the direction of their research career
Cooperative Agreements (U series)

- **Research Project Cooperative Agreement**
  - Supports discrete, specified, circumscribed projects to be performed by investigator(s) in an area representing their specific interests and competencies
  - Used when substantial programmatic involvement is anticipated between the awarding Institute and Center
  - One of many types of cooperative agreements
  - No specific dollar limit unless specified in FOA
Program Project/Center Grants (P series)

- **Research Program Project Grant**
  - Support for integrated, multi-project research projects involving a number of independent investigators who share knowledge and common resources
  - Each project contributes or is directly related to the common theme of the total research effort, thus forming a system of research activities and projects directed toward a well-defined research program goal

- **Exploratory Grants**
  - Often used to support planning activities associated with large multi-project program project grants
Program Project/Center Grants (P series)

- **Center Core Grants**
  - Support shared resources and facilities for categorical research by investigators from different disciplines to work on a joint research effort, or from the same discipline who focus on a common research problem.

- **Specialized Center**
  - Supports any part of the full range of research and development from very basic to clinical.
  - Spectrum of activities comprises a multidisciplinary attack on a specific disease or biomedical problem area.
  - Centers may serve as regional or national resources for special research purposes.
SECTION 3: REVIEW PROCESS
## SCORING

<table>
<thead>
<tr>
<th>Score</th>
<th>Descriptor</th>
<th>Additional Guidance on Strengths/Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Exceptional</td>
<td>Exceptionally strong with essentially no weaknesses</td>
</tr>
<tr>
<td>2</td>
<td>Outstanding</td>
<td>Extremely strong with negligible weaknesses</td>
</tr>
<tr>
<td>3</td>
<td>Excellent</td>
<td>Very strong with only some minor weaknesses</td>
</tr>
<tr>
<td>4</td>
<td>Very Good</td>
<td>Strong but with numerous minor weaknesses</td>
</tr>
<tr>
<td>5</td>
<td>Good</td>
<td>Strong but with at least one moderate weakness</td>
</tr>
<tr>
<td>6</td>
<td>Satisfactory</td>
<td>Some strengths but also some moderate weaknesses</td>
</tr>
<tr>
<td>7</td>
<td>Fair</td>
<td>Some strengths but with at least one major weakness</td>
</tr>
<tr>
<td>8</td>
<td>Marginal</td>
<td>A few strengths and a few major weaknesses</td>
</tr>
<tr>
<td>9</td>
<td>Poor</td>
<td>Very few strengths and numerous major weaknesses</td>
</tr>
</tbody>
</table>

Minor Weakness: An easily addressable weakness that does not substantially lessen impact
Moderate Weakness: A weakness that lessens impact
Major Weakness: A weakness that severely limits impact
Overall impact/priority score is the average of scores of review panel members to one decimal point multiplied by ten. Scores range from 10-90 in whole numbers.
**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 review criteria, and additional review criteria (as applicable for the project proposed).

**Scored Review Criteria**

- Significance
- Investigator(s)
- Innovation
- Approach
- Environment
<table>
<thead>
<tr>
<th>Scored Review Criteria</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Significance</strong></td>
<td>Does the project address an important problem or a critical barrier to progress in the field? Is there a strong scientific premise for the project? If the aims of the project are achieved, how will scientific knowledge, technical capability, and/or clinical practice be improved? How will successful completion of the aims change the concepts, methods, technologies, treatments, services, or preventative interventions that drive this field?</td>
</tr>
<tr>
<td><strong>Investigators</strong></td>
<td>Are the PD/PIs, collaborators, and other researchers well suited to the project? If Early Stage Investigators or those in the early stages of independent careers, do they have appropriate experience and training? If established, have they demonstrated an ongoing record of accomplishments that have advanced their field(s)? If the project is collaborative or multi-PD/PI, do the investigators have complementary and integrated expertise; are their leadership approach, governance and organizational structure appropriate for the project?</td>
</tr>
<tr>
<td><strong>Innovation</strong></td>
<td>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?</td>
</tr>
<tr>
<td><strong>Approach</strong></td>
<td>Are the overall strategy, methodology, and analyses well-reasoned and appropriate to accomplish the specific aims of the project? Have the investigators presented strategies to ensure a robust and unbiased approach, as appropriate for the work proposed? Are potential problems, alternative strategies, and benchmarks for success presented? If the project is in the early stages of development, will the strategy establish feasibility and will particularly risky aspects be managed? Have the investigators presented adequate plans to address relevant biological variables, such as sex, for studies in vertebrate animals or human subjects? If the project involves human subjects and/or NIH-defined clinical research, are the plans to address 1) the protection of human subjects from research risks, and 2) the inclusion (or exclusion) of individuals on the basis of sex/gender, race, and ethnicity, as well as the inclusion (exclusion) of children, justified in terms of the scientific goals and research strategy proposed?</td>
</tr>
<tr>
<td><strong>Environment</strong></td>
<td>Will the scientific environment in which the work will be done contribute to the probability of success? Are the institutional support, equipment and other physical resources available to the investigators adequate for the project proposed? Will the project benefit from unique features of the scientific environment, subject populations, or collaborative arrangements?</td>
</tr>
</tbody>
</table>
ADDITIONAL REVIEW CRITERIA AND CONSIDERATIONS

- **Additional Review Criteria**
  - Protections for Human Subjects
  - Inclusion of Women, Minorities, and Children
  - Vertebrate Animals
  - Biohazards
  - Resubmission
  - Renewal
  - Revision

- **Additional Review Considerations**
  - Applications from Foreign Organizations
  - Select Agent
  - Resource Sharing Plans
  - Authentication of Key Biological and/or Chemical Resources
  - Budget and Period Support
Percentage of reviewed grant applications that receive funding

Computed on a fiscal year basis

Determined by dividing the number of competing applications funded by the sum of the total number of competing applications reviewed and the number of funded carryovers

Success rates continue to remain well below levels 15-20 years ago

You can review success rate data on NIH RePORT throughout the years within each NIH funding Institute or Center or by grant type and activity code
### FY2018 NIH SUCCESS RATES

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>NIH Institutes/ Centers</th>
<th>Number of Applications Reviewed</th>
<th>Number of Applications Awarded</th>
<th>Success Rate</th>
<th>Total Funding</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018</td>
<td>NCI</td>
<td>9,877</td>
<td>1,062</td>
<td>10.8%</td>
<td>$504,933,789</td>
</tr>
<tr>
<td>2018</td>
<td>NHLBI</td>
<td>3,607</td>
<td>862</td>
<td>23.9%</td>
<td>$465,762,356</td>
</tr>
<tr>
<td>2018</td>
<td>NIDCR</td>
<td>835</td>
<td>171</td>
<td>20.5%</td>
<td>$60,200,056</td>
</tr>
<tr>
<td>2018</td>
<td>NIDDK</td>
<td>2,826</td>
<td>508</td>
<td>18.0%</td>
<td>$228,216,319</td>
</tr>
<tr>
<td>2018</td>
<td>NINDS</td>
<td>4,173</td>
<td>835</td>
<td>20.0%</td>
<td>$378,470,977</td>
</tr>
<tr>
<td>2018</td>
<td>NIAID</td>
<td>5,898</td>
<td>1,264</td>
<td>21.4%</td>
<td>$517,525,536</td>
</tr>
<tr>
<td>2018</td>
<td>NIGMS</td>
<td>3,349</td>
<td>876</td>
<td>26.2%</td>
<td>$338,851,775</td>
</tr>
<tr>
<td>2018</td>
<td>NICHD</td>
<td>2,924</td>
<td>509</td>
<td>17.4%</td>
<td>$194,035,050</td>
</tr>
<tr>
<td>2018</td>
<td>NEI</td>
<td>966</td>
<td>215</td>
<td>22.3%</td>
<td>$83,317,285</td>
</tr>
<tr>
<td>2018</td>
<td>NEIHS</td>
<td>1,065</td>
<td>173</td>
<td>16.2%</td>
<td>$64,067,975</td>
</tr>
<tr>
<td>2018</td>
<td>NIA</td>
<td>3,116</td>
<td>873</td>
<td>28.0%</td>
<td>$791,546,904</td>
</tr>
<tr>
<td>2018</td>
<td>NIAMS</td>
<td>1,494</td>
<td>235</td>
<td>15.7%</td>
<td>$81,474,647</td>
</tr>
<tr>
<td>2018</td>
<td>NICHD</td>
<td>741</td>
<td>179</td>
<td>24.2%</td>
<td>$68,908,265</td>
</tr>
<tr>
<td>2018</td>
<td>NIMH</td>
<td>2,565</td>
<td>542</td>
<td>21.1%</td>
<td>$306,113,957</td>
</tr>
<tr>
<td>2018</td>
<td>NIDA</td>
<td>2,030</td>
<td>358</td>
<td>17.6%</td>
<td>$195,474,549</td>
</tr>
<tr>
<td>2018</td>
<td>NIAAA</td>
<td>904</td>
<td>227</td>
<td>25.1%</td>
<td>$79,856,840</td>
</tr>
<tr>
<td>2018</td>
<td>NINR</td>
<td>684</td>
<td>69</td>
<td>10.1%</td>
<td>$28,803,212</td>
</tr>
<tr>
<td>2018</td>
<td>NHGRI</td>
<td>240</td>
<td>57</td>
<td>23.8%</td>
<td>$30,801,014</td>
</tr>
<tr>
<td>2018</td>
<td>NIBIB</td>
<td>1,472</td>
<td>234</td>
<td>15.9%</td>
<td>$70,259,757</td>
</tr>
<tr>
<td>2018</td>
<td>NCCIH****</td>
<td>297</td>
<td>58</td>
<td>19.5%</td>
<td>$25,152,687</td>
</tr>
<tr>
<td>2018</td>
<td>NIMHD***</td>
<td>654</td>
<td>70</td>
<td>10.7%</td>
<td>$34,557,375</td>
</tr>
<tr>
<td>2018</td>
<td>NLM</td>
<td>176</td>
<td>29</td>
<td>16.5%</td>
<td>$8,501,388</td>
</tr>
<tr>
<td>2018</td>
<td>FY Total</td>
<td>49,893</td>
<td>9,406</td>
<td>18.9%</td>
<td>$4,556,831,713</td>
</tr>
</tbody>
</table>
• Overall Scores are assigned a percentile rank
• Most ICs set a payline each year
• Proposals below the payline are typically funded; those above typically are not
• New investigators and ESIs may receive some preference
## FY 2019 NIH Paylines*

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>FIC</td>
<td></td>
<td></td>
<td>2019 funding strategy. Payline not published</td>
</tr>
<tr>
<td>NCATS</td>
<td></td>
<td></td>
<td>Payline not published/FY2019</td>
</tr>
<tr>
<td>NCCIH</td>
<td></td>
<td></td>
<td>FY 2019 Funding Strategy</td>
</tr>
<tr>
<td>NCI</td>
<td>9</td>
<td>8</td>
<td>14 for New &amp; Early Stage-Investigators. 2019 funding policy</td>
</tr>
<tr>
<td>NEI</td>
<td></td>
<td></td>
<td>25% anticipated award rate. Payline not published/FY2019 Operations Plan</td>
</tr>
<tr>
<td>NHGRI</td>
<td></td>
<td></td>
<td>Does not establish Paylines/FY2019 Funding Strategy</td>
</tr>
<tr>
<td>NHLBI</td>
<td>15</td>
<td>16</td>
<td>25 for Early Stage Investigators/ FY 2019 Funding Strategy</td>
</tr>
<tr>
<td>NIAAAA</td>
<td></td>
<td></td>
<td>Does not establish overall Paylines/ FY 2019 Financial Management Plan</td>
</tr>
<tr>
<td>NIAID</td>
<td>14</td>
<td>14</td>
<td>(Funding Strategy) 18 payline for new &amp; early-stage investigators.</td>
</tr>
<tr>
<td>NIAMS</td>
<td>13</td>
<td>12</td>
<td>Funding Strategy for 2019 (Early Stage Investigators: 22)</td>
</tr>
<tr>
<td>NIBIB</td>
<td>19</td>
<td>19</td>
<td>FY 2019 Funding Strategy 24 for New investigators</td>
</tr>
<tr>
<td>NICHD</td>
<td></td>
<td></td>
<td>FY 2019 Funding Strategy -no fixed payline for R01s</td>
</tr>
<tr>
<td>NIDA</td>
<td></td>
<td></td>
<td>Payline not published/FY2019 Funding Strategy</td>
</tr>
<tr>
<td>NIDCD</td>
<td></td>
<td></td>
<td>Payline not published/ General Funding Information</td>
</tr>
</tbody>
</table>

*Albert Einstein School of Medicine; May 24, 2019
## FY2019 NIH Paylines*

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>NIDCR</td>
<td></td>
<td></td>
<td>Payline not published/ FY2019 Funding Strategy</td>
</tr>
<tr>
<td>NIDDK</td>
<td>13</td>
<td>13</td>
<td>FY2019 Funding Strategy -18 for Early Stage Investigators</td>
</tr>
<tr>
<td>NIEHS</td>
<td></td>
<td>10</td>
<td>2019 Funding Strategy</td>
</tr>
<tr>
<td>NIGMS</td>
<td></td>
<td></td>
<td>Payline not published/ Interim Funding Strategy</td>
</tr>
<tr>
<td>NIMH</td>
<td>20</td>
<td>10-20</td>
<td>FY2019 Funding Strategy (higher for new and early-stage investigators)</td>
</tr>
<tr>
<td>NIMHD</td>
<td></td>
<td></td>
<td>Funding Policy-payline not published</td>
</tr>
<tr>
<td>NINDS</td>
<td>15</td>
<td>16</td>
<td>FY2019 Funding Strategy 25 for Early Stage Investigators</td>
</tr>
<tr>
<td>NINR</td>
<td></td>
<td></td>
<td>2019 Funding Strategy/Payline not published</td>
</tr>
</tbody>
</table>

*Albert Einstein School of Medicine; May 24, 2019*
First Level of Review - Scientific Review: Initial peer review meetings are administered by either the Center for Scientific Review (CSR) or one of the NIH ICs with funding authority as specified in the funding opportunity announcement (FOA).

- Peer Review Roles and Meeting Overview
- Each Scientific Review Group (SRG) is led by a Scientific Review Officer (SRO). In addition to the SRO, there is a Chair and a group of reviewers.

- Scoring: The NIH utilizes a 9-point rating scale (1 = exceptional; 9 = poor) for all applications; the same scale is used for overall impact scores and for criterion scores (Scoring Guidance).

- Summary Statement

Second Level Of Review - Advisory Council/Board: The Advisory Council/Board of the potential awarding Institute/Center performs the second level of review (See Advisory Councils or Boards page)
SECTION 4: COMPONENTS OF A COMPETITIVE NIH PROPOSAL
Program Officers may be able to recommend a specific funding opportunity, and will steer you toward those opportunities that most closely align with your project.
Take program officer guidance seriously: they are in the best position to know what will be competitive.

For most opportunities, it is not worth applying without first contacting a program officer or other funder representative to discuss your proposal:

- Email your concept paper or Specific Aims to the program officer, and ask:
  - Are you interested in this type of work?
  - If so, do you have any guidance on how best to approach a proposal?
  - If a program officer prefers to speak on the phone, speak to them on the phone.
An NIH research plan has four main sections:

A. Specific Aims
B. Significance
C. Innovation
D. Approach
• Open with an interest grabbing sentence that will get the reviewers’ attention
  • Avoid “old news” or something they have heard and seen many times
  • Open with an unknown that is related to the gap in evidence
• Describe how your proposed project will build upon and/or differ from what has been done in the field
• Add a statement of need. What is needed to address the gap in evidence?
• Discuss how your study meets the need and tell reviewers what the consequence is if the need is not met
BACKBONE OF THE NIH PROPOSAL: SPECIFIC AIMS

Common mistakes:

- Lacking a clear hypothesis
- Proposing aims that are interdependent (i.e., Aim 2 cannot be accomplished if Aim 1 fails)
- Proposing aims that are unfocused, providing unclear goals, or do not clearly address the hypothesis
- Proposing aims that have no clear future directions
Key information to include:

- Critical evaluation of existing knowledge, including background literature and relevant data
- References that reflect an updated knowledge of the field
- Gaps in evidence that the project is intended to fill
- The research problem, the proposed rationale, current state of knowledge and potential contributions and significance of the research to the field
- The importance and relevance of the research aims
- Why research findings are important beyond the confines of the specific research project (e.g., significance; how research results can be applied)
Clearly relate your proposed work to previous work

Common Mistakes:

- Treating Significance like a background section
  - Always discuss *how* your work relates to previous work and future goals
- No clear rationale
- No discussion of the impacts of the proposed work on human health & other NIH mission areas
**INNOVATION**

*Clearly state what is innovative*

**Innovation can be:**

- Novel approach
- Novel population
- Novel question
- All the above

- Balance novelty and palatability
- Use literature to make the case for innovation
Common Mistakes

- Making claims of novelty that are not true or not supported by the literature cited
- Failing to identify all innovative aspects of the work
- Relying on minimally incremental innovation (e.g., previous work was with men ages 30-45 and the proposed work is ages 30-50)
- Promoting innovation without impact
**Avoid exploratory aims that are not directly related to your hypotheses**

- Most successful proposals are hypothesis driven
- Aims and approach must directly address the hypothesis or focus
- Scope of project must be constrained by budget, length, and available resources (including personnel)
- Use literature and experience to inform design
**APPROACH**

*Have adequate preliminary studies before submitting*

**Common Mistakes**

- No hypotheses
- No clear focus or direction; unrelated research questions
- No clear outcomes
- Overly ambitious
- Failing to address pitfalls & alternative approaches
- Inadequate rationale for design choices/parameters
- Inappropriate design for the research question
NIH VS OTHER AGENCIES

- Hypothesis-driven
- Measurable aims directly contribute to testing the hypothesis
- Clear future directions
- Appropriate to the research team
- Detailed plan with discussion of pitfalls & alternative approaches

- Exploratory
- No human health relevance
- Non-NIH formatting or language (e.g., “objectives” instead of “specific aims”)
- Originally written for another funding agency and recycled
SECTION 5: PATHWAYS TO THE NIH
SUCCESS AT NIH

Successful NIH Investigators:

• Play to their audience— they have a research focus related to the NIH mission
• Have a history of funding and excellent justification for pursuing the NIH rather than other agencies/foundations
• Collaborate with investigators who are already NIH-funded
• Establish a relationship with a program officer
• Follow NIH proposal guidelines
SHOULD I APPLY?

Good reasons to apply for NIH funding

- You have a history of publishing NIH mission-focused research
- You have a history of funding from other agencies or foundations
- You have a well-supported project idea that aligns with IC interests and/or a particular FOA
- You have established a well thought-out collaboration with other investigators funded by the NIH
- You have spoken with a PO and gotten positive feedback

Bad reasons to apply for NIH funding

- You are no longer having success with your other funding sources
PATHWAYS TO NIH FUNDING

- **Which mechanism first?** Depends on your career level and overall goals

- ESIs typically have higher paylines and higher success (with R01s)

- R21s and R03s are competitive, but can be a critical step to generating sufficient preliminary data for an R01

- The best way to get NIH funding is to establish a record of NIH funding
  - Collaborating with investigators already funded by the NIH can be one of the best ways to “break into” the NIH
HOW TO CHOOSE A FUNDING MECHANISM

1. AM I A NEW/EARLY STAGE INVESTIGATOR?
   - YES: CONSIDER R01
   - NO: DO I HAVE A VERY FOCUSED, SHORT-TERM PROJECT IN MIND?
     - NO: CONSIDER COLLABORATING
     - YES: DO I HAVE AN EXCELLENT BUT HIGH-RISK IDEA?
       - NO: CONSIDER R03
       - YES: CONSIDER R21*

2. DO I HAVE AN EXCELLENT BUT HIGH-RISK IDEA?
   - NO: CONSIDER R03
   - YES: CONSIDER R21*

3. DO I HAVE A HISTORY OF FUNDING SUCCESS?
   - YES: CONSIDER R01
   - NO: CONSIDER R21*
COMMON MISTAKES

- Proposing research that does not align with the NIH mission

- Proposing work that is too ambitious or in an area unfamiliar to the PI
  - Collaborate!

- Lacking sufficient preliminary data

- Failing to follow NIH guidelines on formatting and proposal structure
  - Failing to address rigor & reproducibility
  - Failing to account for biological variables

- Failing to resubmit a potentially competitive proposal after it is initially rejected
Hanover Research is available to support UConn faculty. Hanover provides the following core capabilities:

**Pre-Proposal Support**
- Funding prospect research
- RFP analysis
- Concept paper development
- Outreach consulting

**Proposal Development**
- Foundation proposals
- Program and research design consulting
- Proposal production management

**Proposal Review** (2-3 weeks)
- Review for alignment with PA/FOA
- Recommendations using margin comments
- Teleconference debriefs with Grants Consultants

**Proposal Revision** (3-4 weeks)
- Includes all aspects of “Proposal Review”
- Track changes to suggest revisions to narrative
- Ensure clarity and effective use of language

*Contact Matthew Mroz to learn more about the UConn-Hanover Partnership.*