FUNDING OPPORTUNITIES AT THE NATIONAL INSTITUTES OF HEALTH (NIH):

From Planning and Submission of a Grant Application to Scientific Peer Review

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Deputy Chief
Scientific Review Branch
National Institute on Aging
National Institutes of Health
I. Introduction to the National Institutes of Health (NIH): Institutes, Centers, and Offices (ICOs) that make up the NIH. Overall picture of NIH’s commitment to research, Data on Extramural Awards, Funding Mechanisms, Funding Opportunities, and current relevant themes/topics of funding opportunities for AGMUS investigators.

II. Submitting a Grant Application to the NIH: Planning your Grant Application, Writing your Grant Application, Application Format and Structure, and Alignment of Application Structure and Specific Scientific Peer Review Criteria.

III. Scientific Peer Review: Initial Review, Assignment of your Grant Application, the Scientific Review Officer, the Review Meeting, Scoring procedures, descriptors, and descriptions, Criterion Scores, and the Summary Statement.

IV. Questions and Answers. Individual Meetings with Investigators.
The NIH Institutes and Centers (ICs) 20 + 7

- National Cancer Institute (NCI)
- National Eye Institute (NEI)
- National Heart, Lung, and Blood Institute (NHLBI)
- National Human Genome Research Institute (NHGRI)
- National Institute on Aging (NIA)
- National Institute on Alcohol Abuse and Alcoholism (NIAAA)
- National Institute of Allergy and Infectious Diseases (NIAID)
- National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS)
- National Institute of Biomedical Imaging and Bioengineering (NIBIB)
- National Institute of Child Health and Human Development (NICHD)
- National Institute on Deafness and Other Communication Disorders (NIDCD)
The NIH Institutes Cont.

- National Institute of Dental and Craniofacial Research (NIDCR)
- National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK)
- National Institute on Drug Abuse (NIDA)
- National Institute of Environmental Health Sciences (NIEHS)
- National Institute of General Medical Sciences (NIGMS)
- National Institute of Mental Health (NIMH)
- National Institute of Neurological Disorders and Stroke (NINDS)
- National Institute of Nursing Research (NINR)
- National Library of Medicine (NLM)
The NIH Centers

- Center for Information Technology (CIT)
- Center for Scientific Review (CSR)
- John E. Fogarty International Center (FIC)
- National Center for Complementary and Alternative Medicine (NCCAM)
- National Center on Minority Health and Health Disparities (NCMHD)
- National Center for Research Resources (NCRR)
- NIH Clinical Center (CC)
NIH’s Commitment to Research

- Over $30.5 billion annually in biomedical and basic behavioral and social science research.
- More than 80% of the NIH's funding is awarded through almost 58,000 competitive grants to more than 325,000 researchers at over 3,000 universities, medical schools, and other research institutions in every state and around the world.
- About 10% of the NIH's budget supports projects conducted by nearly 6,000 scientists in its own laboratories, most of which are on the NIH campus in Bethesda, Maryland.
NIH Extramural Awards By State and Foreign Site - 2009

- NIH RePORT (Research Portfolio Online Reporting Tools)

UNIVERSIDAD DEL ESTE

MALDONADO-RUIZ, ALBERTO
MINORITY HEALTH DISPARITY BIOMEDICAL AND SOCIAL BEHAVIORAL RESEARCH NETWORK ($538,773)

LIZARDI, LILLIAM
UNDERGRADUATE RESEARCH EDUCATION AND TRAINING PROGRAM (URGREAT) ($493,149)

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NIH Extramural Awards By State and Foreign Site - 2009

UNIVERSIDAD METROPOLITANA

GONZALEZ, KAREN VANESSA
RISE AT UMET (UNIVERSIDAD METROPOLITANA) ($142,928)

SISTEMA UNIVERSITARIO ANA G. MÉNDEZ (2008)

GONZALEZ, KAREN VANESSA
THE ESTABLISHMENT OF AN OFFICE OF SUPPORT OF RESEARCH ($48,793)
Summary by Funding Mechanism for Puerto Rico and Fiscal Year 2009:

Research $53,551,310

Training $2,503,639

Fellowships $192,817

Construction $500,000

Other Awards $186,840

Total $56,934,606
Puerto Rico By Institution FY 2009

PONCE SCHOOL OF MEDICINE ($4,423,595)
SAN JUAN HEALTH DEPARTMENT ($687,330)
UNIVERSIDAD CENTRAL DEL CARIBE ($6,051,191)
UNIVERSIDAD DEL ESTE ($1,031,922)
UNIVERSIDAD METROPOLITANA ($142,928)
UNIVERSITY OF PR CAYEY ($435,308)
UNIVERSITY OF PUERTO RICO ($2,379,280)
UNIVERSITY OF PUERTO RICO AT HUMACAO ($1,346,767)
UNIVERSITY OF PUERTO RICO MAYAGUEZ ($1,495,123)
UNIVERSITY OF PUERTO RICO MED SCIENCES ($32,839,107)
UNIVERSITY OF PUERTO RICO RIO PIEDRAS ($6,102,055)
Funding Mechanisms

- Types of grant funding:
  - Research Grants (R series: R01, R21, R03)
  - Career Development Awards (K series)
  - Research Training and Fellowships (T32, T35 & F series)
  - Program Project/Center Grants (P series: P01, P30, P50)
  - Resource Grants (various series)
  - Trans-NIH Programs
# Most Common Funding Mechanisms

**R01 (NIH Research Project Grant Program)**
- Used to support a discrete, specified, circumscribed research project
- NIH's most commonly used grant program
- No specific dollar limit unless specified in FOA
- Advance permission required for $500K or more (direct costs) in any year
- Generally awarded for 3 -5 years
- All ICs

**R21 (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 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 preliminary data is generally required
- Most ICs
R03 (NIH SMALL GRANT PROGRAM)

- Provides limited funding for a short period of time 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.
- Limited to two years of funding
- Direct costs generally up to $50,000 per year
- Not renewable
- Utilized by more than half of the NIH ICs

R13 (NIH SUPPORT FOR CONFERENCES AND SCIENTIFIC MEETINGS)

- Support for high quality conferences/scientific meetings that are relevant to NIH's scientific mission and to the public health
- Requires advance permission from the funding IC
- Foreign institutions are not eligible to apply
- Award amounts vary and limits are set by individual ICs
- Support for up to 5 years may be possible
Funding Mechanisms – Career Development

**K – CAREER DEVELOPMENT AWARDS**

- **K01**
  - Mentored Research Scientist Development Award
  - The purpose is to provide support and “protected time” (3-5 years) for an intensive, supervised career development experience in the biomedical, behavioral, or clinical sciences leading to research independence.

- **K07**
  - Supports individuals interested in introducing or improving curricula in a particular scientific field as a means of enhancing the educational or research capacity at the grantee institution.
  - Supports two types of activities:
    - (1) Development: for more junior candidates who are interested in developing academic and research expertise
    - (2) Leadership: for more senior individuals who are interested in improving the curricula and enhancing the research capacity within an academic institution.
Funding Mechanisms for Resource-Related Research Projects

**RESOURCE GRANTS**

- **R24**
  - Resource-Related Research Projects
    - Used in a wide variety of ways to provide resources for problems where multiple expertise is needed to focus on a single complex problem in biomedical research or to enhance research infrastructure

- **R25**
  - Education Projects
    - Used in a wide variety of ways to promote an appreciation for and interest in biomedical research, provide additional training in specific areas, and/or to develop ways to disseminate scientific discovery into public health and community applications
Funding Opportunities

- **FOA** (Funding Opportunity Announcement) – Types:
  - **RFA** (Request for Applications - to accomplish a specific program purpose. RFAs indicate the amount of funds set aside for the competition and generally identify a single application receipt date.)
  - **RFP** (Request for Proposals-Contracts)
  - **PA** (Program Announcements-NIH wide)
  - **PAR** (Program Announcement with special receipt dates, referral and/or review considerations)
  - **PAS** (Program Announcement with set-aside funds)
  - **RFI** (Request for Information)
Asthma and Occupational Health
NIA NHLBI NIOSH

PA-10-263 Asthma in Older Adults (R01)
PA-10-264 Asthma in Older Adults (R21)
PA-10-265 Asthma in Older Adults (R03)
PAR-09-138 NIOSH Small Research Grant Program (R03) – Occupational Health
PAR-09-139 NIOSH Exploratory and/or Developmental Grant Program (R21) – Occupational Health
Tissue Culture

PA-10-085 The Role of Cellular Organelles in Alcohol Induced Tissue Injury (R01)
PA-10-086 The Role of Cellular Organelles in Alcohol-Induced Tissue Injury (R21)
PA-10-093 Stress Pathways in Alcohol Induced Organ Injury and Protection (R01)
PA-10-094 Stress Pathways in Alcohol Induced Organ Injury and Protection (R21)
Current Funding Opportunities

Neurosciences

National Institute of Neurological Disorders and Stroke - (NINDS) - http://www.ninds.nih.gov/

National Institute of Mental Health – (NIMH) - http://www.nimh.nih.gov/


National Institute of General Medical Sciences – (NIGMS) - http://www.nigms.nih.gov/
Current Funding Opportunities: National Institute of Neurological Disorders and Stroke - (NINDS)

- **PAR-10-229** Neurological Sciences Academic Development Award (K12)
- **PAS-10-183** Validation of Novel Therapeutic Targets for Huntington's Disease (R01)
- **PAR-10-143** Exploratory/Developmental Projects in Translational Research for Resistant Epilepsy and Epileptogenesis (R21)
- **PA-09-034** Research on the Cognitive Sequelae of Parkinson’s Disease (R21)
- **PA-08-099** Mechanisms of Functional Recovery After Stroke (R01)
- **PA-08-100** Mechanisms of Functional Recovery After Stroke (R21)
National Institute of Mental Health (NIMH)

- Promote discovery in the brain and behavioral sciences to fuel research on the causes of mental disorders
- Chart mental illness trajectories to determine when, where, and how to intervene
- Develop new and better interventions that incorporate the diverse needs and circumstances of people with mental illnesses
- Strengthen the public health impact of NIMH-supported research

- Seeding National Mentoring Networks to Enhance Diversity of the Mental Health Research Workforce (U24)

- Women’s Mental Health in Pregnancy and the Postpartum Period (R01)

- Rapid Assessment Post-Impact of Disaster (R21)

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National Institute of General Medical Sciences (NIGMS)

Basic biomedical research that is not targeted to specific diseases. NIGMS funds studies on genes, proteins, and cells, as well as on fundamental processes like communication within and between cells, how our bodies use energy, and how we respond to medicines.

- Technology Development for High-Throughput Structural Biology Research (P01)
  [Link](http://grants.nih.gov/grants/guide/pa-files/PAR-10-074.html)
- Exploratory Innovations in Biomedical Computational Science and Technology (R21)
- Innovations in Biomedical Computational Science and Technology (R01)
- Short Courses on Mathematical, Statistical, and Computational Tools for Studying Biological Systems (R25)
  [Link](http://grants.nih.gov/grants/guide/pa-files/PA-09-002.html)
Current Funding Opportunities: National Institute of Aging - NIA

- **RFA-AG-11-010** Basic Research on Self-Regulation (R21)
- **RFA-AG-11-003** Subjective Well-being: Advances in Measurement and Applications to Aging (R01)
- **PA-10-042** Critical Illness and Injury in Aging (R01)
- **PA-10-043** Critical Illness and Injury in Aging (R03)
- **PA-10-044** Critical Illness and Injury in Aging (R21)
Current Funding Opportunities

**VIROLOGY**

**RFA-AI-10-006** Integrated Preclinical/Clinical Program for HIV Topical Microbicides (IPCP-HTM) (U19)

**PA-09-151** Pilot and Feasibility Clinical Research Studies in Digestive Diseases and Nutrition (R21)

**PA-09-152** Basic Research on HIV Persistence (R01)
Current Funding Opportunities: National Institute of Child Health and Human Development - NICHD

**RFA-HD-10-017** Identifying and Understanding Effective Interventions for Orphans and Vulnerable Children Affected by HIV/AIDS (R01)

**PA-09-169** Research on Teen Dating Violence (R01)

**PA-09-170** Research on Teen Dating Violence (R21)

**PA-09-140** Community-Based Partnerships for Childhood Obesity Prevention and Control: Research to Inform Policy (R03)

**PA-09-141** Community-Based Partnerships for Childhood Obesity Prevention and Control: Research to Inform Policy (R21)

**PAR-09-084** Enhancing Developmental Biology Research at Undergraduate Institutions Academic Research Enhancement Award (R15)
Current Funding Opportunities: For Investigators in Schools of Education

PAR-10-267  NIMH Research Education Grants (R25)
PAR-09-245  Initiative to Maximize Research Education in Genomics (R25)
PAR-09-104  Initiative for Maximizing Student Development (IMSD) (R25)
PAR-08-082  R25 Alcohol Research Education Project Grants (R25)
PAR-08-003  NIAID Science Education Awards (R25)
PA-10-158  Research on Autism and Autism Spectrum Disorders (R01)
PA-10-159  Research On Autism And Autism Spectrum Disorders (R03)
PA-10-160  Research on Autism and Autism Spectrum Disorders (R21)
PAR-08-207  Meetings, Conferences, and Networks for Research Partnerships to Improve Functional Outcomes (R13)
Office of Behavioral and Social Science Research (OBSSR) – Office of the Director NIH

OBSSR supports behavioral research that underlies psychological processes such as cognition, emotion, temperament, and motivation; and biobehavioral interactions. The term "social" encompasses sociocultural, socioeconomic, and sociodemographic status; to biosocial interactions; and to the various levels of social context from small groups to complex cultural systems and societal influences.

Methodology and Measurement in the Behavioral and Social Sciences (R21)  

Research On Ethical Issues In Human Subjects Research (R01)  

Research on the Economics of Diet, Activity, and Energy Balance (R01)  

Community Participation in Research (R01) PA-08-074

Behavioral and Social Science Research on Understanding and Reducing Health Disparities (R01) PAR-10-136
Current Funding Opportunities: National Center for Complimentary and Alternative Medicine - NCCAM

RFA-AT-11-001 Mechanistic Research on CAM Natural Products (R01)

PA-10-210 Biology of Manual Therapies (R21)

PA-10-152 Diet Composition and Energy Balance (R01)

PAR-08-095 CAM Practitioner Research Education Project Grant Partnership Competitive Renewal (R25)

PA-09-244 Nutrition and Physical Activity Research to Promote Cardiovascular and Pulmonary Health (R21)
Submitting a Grant Application to the NIH

- Read NIH’s and its Institutes and Centers (ICs) **scientific mission, goals, and objectives**
- Understand NIH’s Principles
- **Work closely** with your **Office of Sponsored Research/Grants Support** for internal procedures
Planning Your Grant Application

- Search for Funding Opportunities (FOAs)
  - Two types:
    - **Specialized studies** requested through specific FOAs
    - Investigator-initiated studies requested through general “Parent FOAs”
  - Begin searching active FOAs in your scientific field:
    - **NIH Guide for Grants and Contracts** (The NIH Guide for Grants and Contracts is the official publication for NIH medical and behavioral research grant policies, guidelines and funding opportunities)
    - Web sites of specific ICs

- Take a Second Look at the Funding Opportunity Announcement!
Planning Your Grant Application

- **NIH Mission:**
  - Does your proposed project fit within the NIH mission?
  - **Potential ICs that might support your application?**

- **NIH & You**
  - Identify IC’s website
  - **Contact an IC Program Officer**
  - Type of funding mechanism (time, support in $, implementation, and completion of proposed project)
Writing your Grant Application

- Review the grant application instructions
- FOA special (specific) instructions
- Solicit feedback from colleagues and/or mentors
- Outline the application framework and structure described in the application guide
- Make sure you have adequate preliminary data (not all grant mechanisms)
Application Format and Structure

Research Strategy

- Introduction (only for Resubmissions and Revisions) One page.
- Specific Aims – Needs to address Impact. One page.
- Significance
- Innovation
- Approach
- (6 or 12 pages – depending on mechanism)

Biographical Sketch

- There is a personal statement in narrative form about your experience and qualifications for your role (PI/PD) on the grant application.
- Publications are limited. Fifteen are encouraged.
  - Five most recent
  - Five best
  - Five most relevant

Resources

- Institutional environment and support for the success of the research project.
- For Early Stage Investigators (ESIs), you should describe how institutional investment will lead to success.
## Application Structure vis-à-vis Review Criteria

<table>
<thead>
<tr>
<th>SCORED REVIEW CRITERIA</th>
<th>APPLICATION COMPONENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>• OVERALL IMPACT</td>
<td>• SPECIFIC AIMS (Overall Impact)</td>
</tr>
<tr>
<td>• SIGNIFICANCE</td>
<td>• RESEARCH STRATEGY (1. Significance)</td>
</tr>
<tr>
<td>• INVESTIGATOR</td>
<td>• BIOSKETCH (Personal statement/narrative)</td>
</tr>
<tr>
<td>• INNOVATION</td>
<td>• RESEARCH STRATEGY (2. Innovation)</td>
</tr>
<tr>
<td>• APPROACH</td>
<td>• RESEARCH STRATEGY (3. Approach)</td>
</tr>
<tr>
<td>• ENVIRONMENT</td>
<td>• RESOURCES (Environment/Institutional Investment-Commitment)</td>
</tr>
<tr>
<td>• OTHER CRITERIA (as applicable per FOA/RFA)</td>
<td></td>
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</tbody>
</table>
Initial Review

- Division of Receipt and Referral-Center for Scientific Review
  - First Stop (Some basic administrative review)
  - DRR Professional Staff
  - Team of Referral Officers, PhDs/MDs

- Assignment of Grant Application to:
  - Center for Scientific Review (CSR), Integrated Review Group (IRG), Study Section, Special Emphasis Panel (SEP)
  - NIH Institutes/Centers (ICs)
  - Scientific Review Branch/Division/Office
  - IC Review Committee or SEP
  - Scientific Review Officer (SRO) – Formerly, SRA
Assigns your grant application to reviewers (ideally, six weeks prior to the meeting)

In most cases, three reviewers:
  - Primary
  - Secondary
  - Tertiary

Conducts the review meeting. If no SRO....

Ensures 100% compliance with applicable regulations

Post Review Meeting: Prepares Summary Statements

Do not contact SRO after Review Meeting!

Your post-review meeting Point of Contact is your assigned Program Officer (PO)
Conducted by the SRO and a Review Panel Chair
Chair moderates the scientific and technical discussion and evaluation of your grant application
Chair is also a peer reviewer for the meeting
Most meetings convene for 1 or 2 days
Grant applications are reviewed on established review criteria
Assigned reviewers present their preliminary critiques and scores to the full Review Panel
Open discussion then follows
- Assigned reviewers re-state or modify their scores in light of discussion
- Final scoring is conducted – “private ballot”
Applications are scored on five review criteria using a scale of 1-9 and also an Overall Impact score using 1-9 scale.

- The Overall Impact score is not be the average of the criterion scores.
- Not Discussed (formerly known as “triaged, streamlined, unscored”) applications will receive a Summary Statement showing initial criterion scores from the three assigned reviewers, as well as written reviews.
## Scoring Descriptors

<table>
<thead>
<tr>
<th>Impact</th>
<th>Score</th>
<th>Descriptor</th>
<th>Strengths/Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Impact</td>
<td>1</td>
<td>Exceptional</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Outstanding</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Excellent</td>
<td></td>
</tr>
<tr>
<td>Moderate Impact</td>
<td>4</td>
<td>Very Good</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>Good</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>Satisfactory</td>
<td></td>
</tr>
<tr>
<td>Low Impact</td>
<td>7</td>
<td>Fair</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>Marginal</td>
<td></td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>Poor</td>
<td><strong>Weaknesses</strong></td>
</tr>
</tbody>
</table>
## Scoring Descriptions

<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

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Criterion Scores

- Criterion scores are considered part of the critique but are not discussed at the review meeting.
- NI/ESI R01 applications will be clustered together in review.
  - ESI applications will not be separately clustered within the NI\ESI group.
    - NI/ESI applications will be identified for reviewers so there can be appropriate review in context of career stage.
    - Expectations of preliminary data and publication track record less than for established investigators.
Discussed applications receive an **Overall Impact score** from each eligible (i.e., without conflicts of interest) panel member and these scores will be averaged to one decimal place, and multiplied by 10. The 81 possible *priority scores will thus range from 10-90*.

**Percentiles will be reported in whole numbers.**
Summary statements are shorter and more focused.

Discussed applications will also have a summary (Resume and Summary of Discussion) of the panel’s discussion at the meeting.

Not discussed applications will receive written critiques and criterion scores only.
¡GRACIAS!

¿PREGUNTAS?

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