

Grant Writing Success for the Physician-Scientist in Training

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1

Types of Grants

- **NIH:** disease/physiologic related and up to 6 years of support including clinical training for MD PhD*
 - *F30 (pre-doctoral MD/PhD)
 - PA-11-110
 - F31(pre-doctoral minority)
 - Need to check about coverage of clinical training
 - PA-11-112
 - F31 (NINDS pre-doctoral MD/PhD)
 - Apply earlier, no clinical training covered
 - PAR-13-127
- **NSF** (pure science without relationship to disease; some exceptions)
- **Others:** Foundations (AHA, DOD)

2

F30 Mission Statement

- The participating Institutes award this Kirschstein-NRSA individual fellowship (F30/F31) to promising applicants with the potential to become productive, independent, highly trained physician-scientists, including patient-oriented physician-scientists
- This funding opportunity supports individual predoctoral F30/F31 fellowships with the expectation that these training opportunities will increase the number of future investigators in **basic, translational and clinical research** who are physician scientists.

3

Only a subset of the 20 NIH Institutes support NRSA

- 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 Neurological Disorders and Stroke (NINDS)

Support NRSA: As of April 8, 2013

4

NIH Institutes

- Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD)
- National Institute on Deafness and Other Communication Disorders (NIDCD)
- 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 on Minority Health and Health Disparities (NIMHD)

5

You MUST Discuss Your Proposal with an Institute F30/31 Program Director long BEFORE Submission

F30/31 applications with little relevance/interest to an institute can be returned without review. If reviewed, priority is invariably low. Therefore:

- **Prior to preparing an application**, consult the appropriate NIH Institute website (listed with each Institute's name) for details of current research areas supported and whether they have an F30/31 program
- **Contact the Institute's Program Director for F30/31s and:**
 - Send a brief description of your background, an abstract of your proposed research, and briefly described your planned training (in 100-150 words)
 - Arrange for a phone call or communicate by email
 - Seek advice on the appropriateness of your proposal and what might be done for improvement-this is their job and they like to be helpful.

6

Why and when to apply

- Experience in writing a mentored proposal
- Replaces support by institutional T32 or mentor research grant
- May provide you with a financial “bonus”
- Provides evidence of an individuals effort/ability to obtain support
- Apply as soon as reasonably preliminary data is available (*probably in first two years of graduate school)

7

Guidelines for Applications

- SF424 (R&R) (Updated: July 25, 2013)
 - 204 pages
- **Look closely at section: SF424 (R&R) Supplemental Instructions for preparing NRSA**
 - this gives specific information for grant preparation including all page limits
 - do not exceed page limits and follow font directives (font type and size, margins)

8

Grants.gov - Download Application Package - Windows Internet Explorer

https://apply01.grants.gov/apply/forms_apps_idx.html

Grants.gov - Download Application Package

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DOWNLOAD APPLICATION PACKAGE

Note: You will need to download and install [PureEdge Viewer](#) / [Adobe Reader](#), prior to downloading an Application Package.

To download an application package, enter the **appropriate CFDA Number OR Funding Opportunity Number** and click the "Download Package" button.

CFDA Number:

Funding Opportunity Number:

Funding Opportunity Competition ID:

If you do not remember the Funding Opportunity Number for the grant opportunity, return to the [Find Grant Opportunities](#) section to locate the grant opportunity and then return to this screen to enter the number.

Done

Internet 100%

9

Applications

- Notify the MSTP office and your Department re: planning application- they are very helpful; proposal must be submitted through your schools Grants & Contracts (G & C) office.
- Use NIH form pages (available on line)
- You will need an ERA commons account (grants and contracts office)
- Submission made on line by G&C
- Usually needs to go to G&C 3 days before submission; G&C should be sent the final version that is ready for submission.
- Generally three submission dates per year with funding beginning about 6 months later.
- April 8, August 8, December 8
- Reviewed ~3 months later, funding ~ 6 months after submission

Application Components

- 1) Three reference letters (these are NOT from your mentors).
- 2) *Project Summary
- 3) *Project Narrative
- 4) *Bibliography
- 5) Facilities
- 6) Equipment
- 7) A description of your combined degree program
- 8) Your biosketch (on the NIH Fellowship form)
- 9) Your mentor's biosketch(s)(up to 4 pages each)
- 10) *Specific Aims (1 page)
- 11) *Research Strategy (6 pages)
- 12) Human Subjects (if used)
- 13) Vertebrate Animals (if used)(address points 1-5)
- 14) Data and Resource Sharing Plan
- 15) Respective Contributions (1 page)
- 16) Selection of Sponsor and Institution (1 page)
- 17) Training in the responsible conduct of research (1 page)
- 18) Goals for Fellowship Training (1 page)
- 19) Activities planned under this award (1 page)
- 20) Doctoral dissertation and other research experience (2 pages)
- 21) Sponsor and co-sponsor information (6 pages)
- 22) Cover Letter

11

Key Issues for Reviewers

- Will the proposal lead to the development of a scientist-what is the overall quality of the proposal as a *training tool*?
- Key elements
 - Candidate
 - Proposed research (about 70% of weight)
 - Training plan
 - Mentor
 - Environment and institutional support
 - Other issues
 - ethical conduct of research
 - Animals or human subjects
- Grammar and organization are critical

12

Candidate

- History of research experience
 - Publication record
- Commitment to research and a career as an independent investigator
- Contribution to proposal
- Letters of reference (3)
- Time allotment
 - Research (more than a year)
 - Specific education activities

13

Personal Statement

- Training background
- Why project was selected
- Selection of mentors, co-mentor
- Composition of research committee
- Training plan-what do you hope to learn and how the planned training might fill a deficient or prepare you for next step in training.
- How will project lead you to the next level of training?
- State professional goals
- Goal of independence as a physician scientist

14

Research Training Plan

- Specific Aims (1 page)
- Research Strategy (6 pages)
 - a. Significance
 - b. Innovation
 - c. Approach

15

Specific Aims (one page)

- **Structure**
 - **Introductory paragraph** (1/3 to 1/2 page) that provides an overview of the proposal. Inclusion of a simple mechanistic **cartoon** summarizing project is very strongly suggested
 - **Specific Aims** (usually 2-3) succinct descriptions of proposed research in order of performance. Should be inter-related. Headings will be re-used in approach. The Aims should be thematically inter-related and flow from the one that is the most achievable (for which you have the most preliminary data) to the most difficult.

16

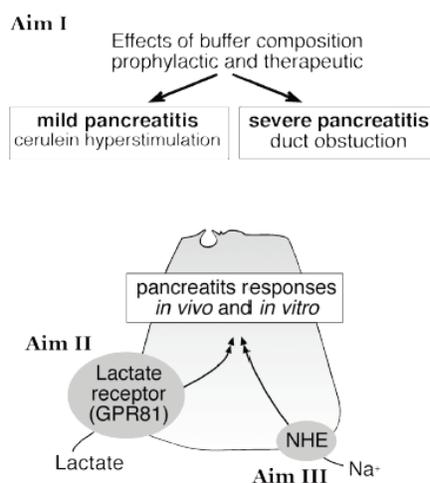
Specific Aims: Example

- **A. Specific Aims/objectives).**
- 1) Examine the effects of standard intravenous buffers (Normal saline and Lactated Ringers) in *in vivo* rodent models of mild and severe pancreatitis.
-
- 2) Investigate the molecular mechanisms of lactate and the lactate receptor, GPR81, on the acinar cell and pancreatitis responses.
-
- 3) Study the effects of extracellular sodium and sodium-proton exchange, specific buffers/ions and ligands on intracellular pH and pancreatitis responses.

Figure 1 (next panel) corresponds to Specific Aims 17

Specific Aims: Example Summary Figure

Figure 1



18

Significance

- Usually 1/2 page
- Sufficient background that scientists with an unrelated scientific or clinical background will understand the importance of the proposal
- Provide a compelling reason why the research is important
- Discuss how it might advance scientific knowledge
- Highlight translational value/clinical importance =
- Should lead into Specific Aims/Approach

19

Approach (4 pages)

- Follows headings of **Specific Aims**
 - Provide rationale, methodology, and preliminary data for each aim, and comment on feasibility. Include methods for analysis of data and power calculations
- Under a separate heading, such as “*Discussion*” or “*Expected results and Alternatives*” discuss anticipated results, possible problems, and alternate strategies.
- If you require specific technical training, discuss how this will be accomplished (it is good to include this)
- Give **time line**-include both research according to Aims and timing of specific learning experiences

20

Grant Proposal Structure cont;

- **Preliminary data**

- Usually unpublished data (published data in Significance)
- Must follow **Specific Aims**
- Ideally, preliminary data should be available for each Aim
- Especially important to provide evidence of feasibility with new/difficult approaches
- Specifically **STATE** whether or not you generated preliminary data
- Strike a balance between presenting sufficient data to convince the reader of feasibility without having reviewers saying the grant has been completed
- Although preliminary is not officially required, it helps, a lot!!

21

Review Criteria: Proposed Research

- Quality as an instrument for learning
- Relevance to interests of applicant and sponsor(s)
- Scientific merit
- Feasibility
 - Reasonable **expectation for completion** during the funding period (**match plans with duration of funding**) –**do not be over-ambitious**
 - Preliminary data
 - Supports hypothesis
 - Evidence of effort by applicant
 - *Combination of work by applicant and others – acceptable, but clearly denoted*

22

Training plan: additional critical elements

- Regular meetings with mentor
- Thesis committee established; reasons for selecting members (how will they enhance your learning experience)
- Other important faculty
- Presenting/attending conferences, both local and national
- Learning scientific writing skills

23

Training in Research

- **Plan for training:** what will you learn, how will you learn it and how will it prepare you for the next career step (1/4-1/3 weight of proposal)
 - Detailed description of what will you be learning
 - What educational deficits will be rectified (general areas relevant those performing research-writing, grant writing, biostatistics, ethical conduct of research)
 - What will be your new didactic educational experiences (relevant to grant proposal)
 - What will be your **new** scientific experiences (new system, technique)
 - Continuation of a college research project in the same laboratory is often not well received without defining “new” learning experiences.

24

Training in Research

- **Plan for training during clinical years:**
- **Detailed** description of what will you be learning/doing
 - Continue work in dissertation research laboratory
 - To finish up publications or to do new research
 - Conduct research in a clinical department
 - Translational research
 - New techniques, technologies
 - Attend scientific seminars, meetings
 - Research electives
 - Learn how to design clinical trials, obtain IRBs
 - Mentor junior MD-PhD students
 - Current basic science research that impacts clinical problems

25

Mentor (1/4-1/3 weight)

- **History of training**
 - Number of trainees
 - Outcomes (academic positions)
 - Current number of trainees
- **Funding**
- **Experience relevant to research topic**
- **Plan for regular interactions with trainee**
 - Frequency
 - Nature (one on one, lab meetings)
 - Knowledge of specific trainee needs
- **Co-mentor**
 - for providing needed additional expertise and/or record of mentoring success-especially useful with junior sponsors

26

Environment

- **Laboratory**
 - Opportunities to interact with other students, post-docs, technicians
 - Special instrumentation and expertise
- **Department**
 - Complimentary learning experiences and areas of expertise
 - Didactic conferences, research presentations
- **Institution**
 - Cores and centers
 - Specific educational experiences-grant writing

27

Mentor, sponsors, institution

- **Mentor**
 - Training record-favors those with training experience
 - Active grant support
 - Relevant interests
 - Time to spend one on one with applicant
- **Co-mentors/sponsors**
 - **Usually a plus**-especially if they add a new area of expertise
 - Usually onsite
- **Advisory/progress committee**
 - **Establish at time of application**; relevant expertise
- **Institution support**
- **Courses, seminars, research forum**

28

Responsible Conduct of Research.

- Every NRSA fellow **must** receive instruction in the responsible conduct of research.
- **Applications must include the candidate's plans for obtaining instruction in the responsible conduct of research, including the rationale, subject matter, appropriateness, format, frequency and duration of instruction. The amount and nature of faculty participation must be described.**

Templates with critical data often available from your MD/PhD or Graduate Program Office

29

Research Subjects

- Must include specific responses
 - Animal policy and welfare
 - Human subjects
- Estimates of subject numbers
 - Must include power-calculations/estimates

Reviewing another person's grant is helpful

30

Referees

- Need to have at least 3 letters of reference-do not provide more than 4-5
- Formal component of submission in which you will need to provide referee's name, department, institution, and department
- You will need to provide referee your ERA commons user name, your name on application, and funding opportunity announcement number
 - If you have been on your institutions T32 (MSTP), you will have to add a "Principal Investigator" role to your eRA commons ID.
- Select **faculty** from college with whom you did research, medical school faculty who know you (e.g. program directors, advisors)

31

Scored Review Categories

- Overall impact
- Candidate
- Sponsors, collaborators, consultants
- Training plan
- Training potential
- Institutional environment and training commitment

Most applications take more than one submission-read the reviewers criticisms and respond thoughtfully-the rebuttal is critical

32