

Grant Support

Introduction

Academic researchers in the field of geriatric mental health have numerous sources from which to cull funding for their research interests, from the National Institutes of Health (NIH) to private industry. The majority of biomedical research is sponsored by industry, which includes pharmaceutical, biotechnology, and medical device companies. In 2003, these combined accounted for 57% of funded biomedical research.¹ Private foundations, independent research institutes, and private individuals sponsored 3% of research, with the remainder funded by local, state, and federal government, mainly the NIH.¹

A doubling of the NIH budget from 1998 to 2003 stimulated growth in scientific infrastructure. Universities built new science buildings and took on more graduate students and postdocs to fill them without adding a significant number of permanent positions.² Applications for grants nearly doubled as well--from 24,221 in 1997 to 45,688 in 2006.³

On the surface, this looks like good news for the medical sciences. But without funding that matches inflation, and with increased numbers of postdocs seeking science careers, future generations of scientists may be less inclined to enter research.

The National Institutes of Health offer a variety of funding mechanisms that are appropriate for researchers at all levels of career development, but with 5 years of flat funding for the NIH, reviewers are becoming more conservative in deciding which projects are fundable, which means investigators at all career levels should be aware of other funding opportunities from private not-for-profit foundations as well as industry funding.

Different grants for different stages of career development

Individuals at all career stages seeking grant support from the NIH have several avenues of funding to pursue. The alphabet soup of grants and awards available from the NIH can be confusing to sort through, but the Office of Extramural Research home page on the NIH Web site has a wealth of information about grant basics, types of grant

funding, award data, an overview of the review process, and how to submit your completed application online.⁴ Geriatric mental health researchers should also check the "Research Funding" section of the National Institute of Mental Health Web site for funding announcements specific to mental health research.⁵

National Research Service Awards

Institutional

The Ruth L. Kirschstein National Research Service (NRSA) Awards comprise both institutional training grants and individual fellowship grants of up to 5 years for predoctoral and postdoctoral fellows studying specific areas of health research.⁶ Qualifying institutions should have a proven foundation of research in the proposed area of research, as well as sufficient staff and facilities to successfully meet the stated objectives of the proposal. T32 grants are available to institutions as support for graduate and postdoctoral research trainees who will ensure an adequate workforce and continued leadership in areas of research deemed nationally critical. For the NIMH, this means, "to reduce the burden of mental disorders and HIV/AIDS through research on mind, brain, and behavior."⁷ Individual trainees can receive up to 5 years of support as a predoc and up to 3 years of support as a postdoc on a T32.

Individual

Individual NRSA awards for mental health researcher fellows include the F30, F31, and F32 awards. The F30

award supports promising predoctoral researchers on a path to becoming successful independent physician-scientists. The F31 award is meant to support diversity in research and is available to predoctoral researchers to support research that will lead to a PhD, MD/PhD, or other research doctoral degree in biomedical, behavioral, health services, or clinical science. Postdoctoral scientists who show potential for becoming successful independent researchers may apply for the F32.⁸ The same time limits for support apply to F32s as T32s.

Mentored researcher awards (Ks)

K awards, also known as career development awards, are generally given to mentored researchers who are transitioning to independent research. The K01, K08, K22, K23, and K25 awards allow for protected time of 3-5 years for a mentored junior investigator to gain experience before becoming an independent researcher.⁹ The most common career development award is the Mentored Research Scientist Development Award (K01). These awards are non-renewable and applicants are usually restricted to one mentored career award. Proposed research must adhere to the mission of the NIMH of reducing the national mental disorders burden. During the last 2 years of their K award, investigators are encouraged to begin applying for independent research support, via the “R” grant mechanism. During this time, the NIH allows for a bit less (50%) effort toward the K, in order to allow the investigator to prepare for or to conduct independent NIH-supported research (R grant).¹⁰

The K02 and K24 awards are designed for early to mid-career investigators who already have active, peer-reviewed, independent research support from the NIMH.^{9,10} These awards provide for up to two 5-year terms, including one renewal.

A comprehensive list of NIMH supported K awards can be found in **Table 1**.

Independent scientists and senior investigators (Rs)

Investigator-initiated research grants, (Rs) are typically given to independent scientists. R01s are a must for researchers making the leap to independence. Funding is from 3 to 5 years. Selected R awards, which are appropriate for independent researchers at universities and non-profit organizations, are listed in **Table 2**.¹¹

New innovator awards

The NIH Director’s New Innovator Award was created in 2007 to support doctoral-level investigators with bold, novel, innovative research projects that could potentially have a major impact on biomedical and behavioral research. In announcing the new award, NIH Director Elias Zerhouni, MD, stated, “New investigators are the future of science, and innovative ideas are its lifeblood. This flagship program underscores NIH’s commitment to supporting these two critical elements of the research enterprise.”¹²

In the award’s initial year, the NIH received 2100 applications and awarded 30 New Innovator awards. Candidates should be new investigators who have not received an R01 research grant.¹³

Pathway to Independence Award

The K99/R00, commonly known as the “Kangaroo” award, is meant to ease the transition to independent research. It entails 2 years of mentored research followed by up to 3 years of independent support upon securing an independent research position. Applicants must have no more than 5 years postdoctoral research training experience.¹⁴

US Department of Veterans Affairs

The stated mission of the Veterans Health Administration’s Geriatric Research, Education, and Clinical Centers (GRECCs) is to, “focus attention on the aging veteran population, to increase the basic knowledge of aging, to transmit that knowledge to health care providers, and to improve the quality of care to the aged.”¹⁵ There are currently 21 GRECCs across the VA system, and all are university-affiliated and provide training opportunities and salary support for full and part time research appointments. In 2006, 16 GRECCs offered advanced fellowships in geriatrics for physicians and postdocs with at least one year of post-doctoral clinical training.¹⁶

In addition, the VA’s Office of Research and Development (ORD) offers a career development program for clinical and non-clinical researchers who are committed to becoming appointed researchers at the VA.^{17,18} There are 3 levels of mentored career development awards for entry level (CDA-1) and mid-level (CDA-2) researchers, a transition award (CDTA) for clinicians only, and a non-mentored career development enhancement award (CDEA) for senior-level scientists.¹⁸ Candidates can visit the ORD’s Health Services Research and Development Service Web site at

<http://www.hsrdr.research.va.gov/> to learn more about award opportunities with ORD.

Foundations and philanthropic organizations

Foundations typically support early career researchers who not have yet received major federal funding for independent research. Grants from foundations and other charitable organizations help junior-level researchers who are struggling to get their bearings in a tough funding climate.

The Howard Hughes Medical Institute (HHMI), the largest private supporter of biomedical research in the United States, is instituting a new awards program for researchers struggling with funding due to the current climate at the NIH. HHMI expects to fund up to 70 early career scientists in 2009. Early career scientists can also apply for fellowships or lab group leader positions with Janelia Farms, HHMI's research campus. Visit <http://www.hhmi.org/research/> to learn more about HHMI awards and Janelia Farms.

NARSAD, billed as "The World's Leading Charity Dedicated to Mental Health Research," awards grants to postdocs and assistant, associate, and full professors. In 2008, NARSAD awarded 231 new grants to mostly early-career investigators. Proposals are reviewed by NARSAD's Scientific Council, a volunteer group of leaders in the field of psychiatric and neuroscience research. Their Young Investigator awards provide \$30,000 annually for up to 2 years to enable early-career researchers to collect pilot data for further grant funding from the NIH. Visit <http://narsad.org/research/apply/> to learn more about available grants.

The **Burroughs Wellcome Fund (BWF)** provides grants and career awards to biomedical scientists doing translational research at academic and non-profit institutions. BWF aims to "support investigators who are working in, or entering, fields in the biomedical sciences that are poised for significant advance but currently undervalued and underfunded." BWF's Career Awards for Medical Scientists program provides up to \$700,000 over 5 years for postdocs with at least 2 years of research and are at least 2 years from reaching independent investigator status. More information is available at <http://www.bwfund.org/>.

The Paul Beeson Career Development Award in Aging Research Program supports independent clinical researchers who are committed to becoming leaders in

aging research. The program is mentored and provides around 10 awards annually for 3-5 years of support to clinical researchers with a doctoral degree who have completed clinical training. Former PIs with R01 grants and former K awardees are not eligible for this award. The program is sponsored by the John A. Hartford Foundation, the Atlantic Philanthropies, the Commonwealth Fund, the Starr Foundation, and the National Institute on Aging. For more information, qualified candidates should visit http://www.beeson.org/program_pa.cfm.

The Donald W. Reynolds Foundation awards institutional grants via its Aging and Quality of Life Program. Funded programs support geriatric training for medical residents and practicing physicians. Visit <http://www.dwreynolds.org/> to view RFPs and learn more about the foundation.

The Alzheimers Association has 5 individual research grants to support research focused on dementia research. See http://www.alz.org/professionals_and_researchers_research_programs.asp for program announcements and how to apply.

The Brookdale Foundation Leadership in Aging Fellowship provides 2 years' support to early career researchers who are based at a sponsoring institution, have mentor support, and can commit at least 75% of time to their career development in aging research. <http://www.brookdalefoundation.org/Leadership/BNFLeadership.htm>

The American Federation for Aging Research also provides grants to junior investigators who have not yet received independent research funding. Qualified candidates should be just beginning an independent research career and be in the first or second year of a junior faculty appointment. <http://afar.org/afar99.html>

Industry funding

Funding from industry, particularly biotech firms and the pharmaceutical sector, is more difficult for academic researchers to come by, although the majority of research and development in the United States is funded by pharmaceutical companies.¹⁹ In 2007, the pharmaceutical industry invested \$58.8 billion into research and development, compared with the NIH budget of nearly \$29 billion.^{20,21} The majority of industry funds are allocated to drug development--not research--by way of clinical trials.¹⁹ However, most of the pharmaceutical giants fund private charitable foundations that award grants to governments and non-profit organizations for education, patient care and treatment,

and awareness campaigns.

After years of decreases in academic research and development funding, industry support for research at colleges and universities increased slightly to about 2.4 billion in 2006.^{22,23} Because industry sponsors don't usually post FOAs, academics interested to learn about funding opportunities should use professional networks as opportunities to get to know peers in industry, call the companies directly, or visit their Web sites for information about funding opportunities related to your research interests. Researchers should be aware of conflict-of-interest concerns that often accompany industry grant support of academic research.^{24,25} Since 2005, intramural NIH researchers have been forbidden to accept industry funds, and the US Department of Health and Human Services requires that NIH-funded institutions enforce a financial conflict of interest policy that applies to all extramural investigators.²⁶

Finding funding opportunities

Talk to your mentor. Your mentor is also an invaluable guide in helping to formulate your project plan, write your grant proposal, provide letters of recommendation, and assist in finding and securing grant opportunities.

Watch for program announcements on the NIH and NIMH Web sites. All grant applications must be sent in response to Funding Opportunity Announcements (FOAs). Types of FOAs include Parent Announcements (formerly known as unsolicited or investigator-initiated applications), Program Announcements (PAs), Request for Applications (RFAs), and Request for Proposals (RFPs). Read the program announcements carefully. They contain detailed information about who/what/where/why as well as special requirements related to that specific award or grant. PAs for NIMH can be found at <http://www.nimh.nih.gov/research-funding/grants/program-announcements.shtml> and at the NIH Web site at <http://grants.nih.gov/grants/guide/index.html>.

Grants.gov. Established in 2002, Grants.gov is a searchable database of over 1000 grant programs from 26 federal agencies that are available to individuals, organizations, and small businesses.

CRISP. The Computer Retrieval of Information on Scientific Projects (CRISP) is a database with information about active federally funded biomedical research grants. Investigators can check <http://crisp.cit.nih.gov/> for research gaps that need to be filled or look at already funded projects for ideas on how to tailor proposals to increase the chance

of getting funded.

MedEdMentoring.org. Developed with the support of the National Institute of Mental Health (under contract/grant HHSN278200444084C), the MedEdMentoring.org Web site offers valuable career development tools for junior, mid-level, and senior investigators, including funding announcements, presentations from established researchers, and interactive learning modules. See **Table 3** for links to sections of the site that are particularly helpful for investigators seeking funding.

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Table 1. NIMH Supported Career Development Awards

Mentored career development awards		
K01	Mentored research scientist development award	<ul style="list-style-type: none"> • Supports intensive supervised research experience • Must have a research or health professional doctorate, (eg, PhD or MD) and postdoc research experience • Research area must support the advancement of the individual's research abilities • 3-5 years
K08	Mentored clinical scientist development award	<ul style="list-style-type: none"> • Supports supervised research in biomedical and behavioral research, including translational research • Candidates must be outstanding clinician research scientists with a health professional doctoral degree • 3-5 years
K22	NIMH research career award for transition to independence	<ul style="list-style-type: none"> • 2-phased award for physician scientists and senior postdoctoral investigators • Qualified participants gain significant experience in interdisciplinary mental health research fields in an NIMH intramural laboratory for a period of up to 3 years, followed by up to 2 years independent research support at an extramural institution • Requires 100% effort toward research activities during intramural phase, and minimum 75% effort toward research and career development in extramural phase
K23	Mentored patient-oriented research career development award	<ul style="list-style-type: none"> • Supports supervised patient-oriented research with direct patient interaction • Health professionals with clinical doctoral degree or equivalent (eg, MD, DO, PhD, PsyD, etc.) • Areas of research include: 1) mechanisms of human disease; 2) therapies; 3) clinical trials; and 4) development of new technologies • Research must be on human subjects; grantee must directly interact with subjects • 3-5 years
K25	Mentored quantitative research career development award	<ul style="list-style-type: none"> • Supports mentored researchers with quantitative science or engineering backgrounds who wish to gain knowledge of methods and experimental approaches to biomedicine, bioengineering, bioimaging, or behavioral research in order to become leading members of multidisciplinary health and disease research teams • 3-5 years
Early to mid-career awards for independent researchers		
K02	Independent scientist award	<ul style="list-style-type: none"> • Supports newly independent scientists who need intensive research time to advance their research careers • Encourages development of outstanding scientists • Candidates must have a doctoral degree and independent, peer-reviewed support • 3-5 years
K24	Mid-career investigator award in patient-oriented research	<ul style="list-style-type: none"> • Support for clinician-investigators to devote time to patient-oriented research • Award recipients will also act as research mentors to clinical residents, fellows, and junior faculty in the conduct of patient-oriented research • Applicants must be mid-career, health professional doctorates at associate professor level or equivalent • 3-5 years

Table 2. NIMH Supported Research Grants

R01	Investigator initiated research grant	<ul style="list-style-type: none"> • Most common mechanism used to support research by independent NIH investigators • 3-5 years of support
R03	Small research grant program	<ul style="list-style-type: none"> • Provides short-term, limited funding to support pilot or feasibility studies, data collection or analysis, or small research projects • Up to 2 years of support • Up to \$50,000/year
R15	Academic Research Enhancement (AREA grant)	<ul style="list-style-type: none"> • Supports small research projects in schools that have not been major recipients of NIH research grants • Up to 3 years of support • Maximum \$150,000 over length of project
R21	Exploratory/Developmental grants	<ul style="list-style-type: none"> • Encourages exploratory and developmental research projects • Up to 2 years of support • Maximum \$275,000 over the length of project
R24	Research infrastructure support program	<ul style="list-style-type: none"> • Supports research projects that will enhance biomedical research via infrastructure or resource development; NIMH supported programs include: <ul style="list-style-type: none"> o Minority research support program o Interventions and practice research infrastructure program (IP-RISP) o Translational research in behavioral science
R25	Research education grants	<ul style="list-style-type: none"> • Goal is to foster the development of mental health researchers with creative and innovative educational programs--regionally, nationally, or at a single institution • Size and duration of the award dependent on the program scope
R34	Exploratory clinical research grants	<ul style="list-style-type: none"> • Provides support for the development of Phase III clinical trials • NIMH only accepts applications in response to specific FOAs, not in response to the PA • One year of support • Up to \$100,000
R36	Mental health dissertation research grants to increase diversity	<ul style="list-style-type: none"> • Encourages diversity in mental health research workforce • Supports dissertation research for doctoral candidates in accredited research doctoral programs in the United States and its territories and Puerto Rico • Up to \$35,000/year • Up to 2 years support

Table 3. MedEdMentoring.org: Funding Tips and Resources

Funding Opportunities http://www.mededmentoring.org/resources.asp?resourceTypeID=8	This resource guide lists federal and foundation grant sources, plus links to other Web sites with funding opportunity lists.
Developing Winning R01 Proposals http://www.mededmentoring.org/proginfo.asp?progid=12	Presentation by Gwenn Smith, PhD, concerning how to write R01 proposals that will increase your funding chances.
Interpreting and Responding to Grant Reviews http://www.mededmentoring.org/proginfo.asp?progid=9	This presentation by Stephen J. Bartels, MD, MS, describes how to interpret grant reviews and revise your application accordingly.
A Reviewer's Perspective on Grant Applications http://www.mededmentoring.org/proginfo.asp?progid=20	Barry Lebowitz, PhD, spent 30 years as a grant reviewer at the NIMH. In this presentation he offers valuable advice on writing grant applications.
K Hints http://www.mededmentoring.org/proginfo.asp?progid=25	In this presentation, Drs. George Siegle and Charles F. Reynolds III discuss how to successfully apply for Mentored Career Development Awards.
How to Prepare A Grant Budget http://www.mededmentoring.org/firsttuesday/sepember2007/index.asp	Maureen Halpain, MS, talks about writing a grant budget; from following funding guidelines to accurately estimating expenses.
The Current Funding Climate: How Can Early-Career Geriatric Mental Health Researchers Survive and Thrive? http://www.mededmentoring.org/firsttuesday/august2007/index.asp	With a stagnant budget and success rates for NIH grants falling, Barry Lebowitz, PhD, discusses strategies on finding the right grant and writing the right proposal.
Sustaining Salary Support Through Non-Federal Funds http://www.mededmentoring.org/firsttuesday/june2006/index.asp	Joel E. Streim, MD, explores sources of funding outside the NIH, including industry and foundation grants.