Preparing Research Proposals in Psychology:
The Graduate Student Guide to Funding

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Glossary of Terms

The following terms and definitions should help you navigate this guide.

Dissertation Awards: These provide funding for specific tasks related to the dissertation research.

Extramural Research: This refers to research conducted by scientists who work outside (external) of the agency that provides funding.

Facilities and Administrative Costs (F & A): This is the overhead charged by your university or agency receiving the grant award for operating costs—also called indirect costs.

Fellowships: These provide support (usually primarily salary) for an individual for specific training and research activities.

Funding Mechanisms: This refers to the specific type of grant, for instance, predoctoral fellowships or research grants. This is important because there are several types of grants and fellowships.

Grants: These provide money to an eligible entity (such as a university) for a designated investigator to carry out a specific approved project.

Intramural Research: This refers to research funded by and conducted within a specific agency, institute, or center by scientists who work there (internal).

Letter of Intent: This is a brief letter stating one's intent to respond to a specific solicitation. Some agencies (such as NSF) require this for only some solicitations, other agencies request this so that they can estimate the number and expertise of reviewers they will need.

NSF: The National Science Foundation. This is *not* part of PHS (see below)—it funds research and education in most fields of science and engineering, but does not fund clinical or health research.

PHS: The U.S. Public Health Service (PHS) includes most federal agencies dealing with health and welfare. This includes the National Institutes of Health (NIH), the Centers for Disease Control and Prevention (CDC), The Agency for Health Care Quality and Research, and the Indian Health Service, , among others (does not include NSF—see above).

PHS 398: This *has been* the standard application form for research grants from the PHS. However, agencies have switched to online submission at Grants.gov and using SF424 (see below), although several components of the PHS 398 are included in the SF424 format.

Predoctoral: This covers graduate doctoral training prior to awarding of the doctoral degree.

Principal Investigator: The person who submits the funding application and assumes primary responsibility to carry out the proposed activities. Referred to as the "PI."

Program Announcement (PA): This is a formal statement about new or ongoing extramural activity or mechanism—this can be an invitation for new applications, a modification, or a reminder of continuing interest in a research area.

Program Solicitation: Some agencies (such as NSF) use a program solicitation to encourage solicitation of proposals in specific areas of interest to NSF. The standard across most all agencies is to request proposals in specific areas with some provisions for investigator-initiated ideas and proposals.

Postdoctoral: This covers the time period following the awarding of the doctoral degree; the time period considered varies, but typically is up to 7 years post degree.

Request for Applications (RFA): This is a formal statement from a funding agency that invites grant or cooperative agreement applications to accomplish a specific program purpose. RFAs indicate the amount of funds set aside, the estimated number of awards, and the submission due date. These are usually reviewed by a special panel convened by the group that issued the RFA.

Scholarships: A scholarship is an award of funding not tied to any specific research or training plan, but rather based on merit or other criteria.

Scholars: Scholars programs typically provide research and training support for a group of students whose research fits within specific guidelines.

SF424: This is the new (and somewhat overwhelming) application form used on Grants.gov. for PHS applications. Your department or grants office will help you navigate this.

Traineeships: Departments often have training grants awarded to faculty for the purposes of providing enhanced training for graduate students. These can be for predoctoral or postdoctoral traineeships, depending on how the program is structured. Application is to the department or faculty member.

E-mail from a successful UC psychology graduate student…on sharing his NIH predoctoral training application (F31).

I think this is great that you are compiling these applications. As I was preparing my own application, I found it incredibly helpful to see other people's previously successful efforts. The application that is attached is my second submission. I worked very hard on my first submission and was quite proud of it. My score, however, placed me in the 53rd percentile, far out of the fundable range. I was devastated and needed to put the feedback away for a couple weeks before I could really absorb it. However, when I was able to address the feedback with open eyes (and sans anger!), I saw how insightful and correct it all was. I redrafted the entire application, spending several months wrestling with the complex questions that the reviewers raised. My second time around, my score placed me in the 2nd percentile. Quite a leap!

Please feel free to share my story with any discouraged students!

When you have decided which agency and funding opportunity is most appropriate for you, it is a good idea to read successful proposals. Other students in your department may have received the same type of award or your advisor may have helpful contacts. Abstracts and contact information are available for recently funded applications on each agency's website. For instance, the NSF website (nsf.gov) provides abstracts and contacts for NSF funded applications. PHS agencies provide this information on the Computer Retrieval of Science Projects (CRISP) website. (http://www.crisp.cit.nih.gov/)

As you can see, PERSEVERANCE is important. Don't get overwhelmed or discouraged--very, very few grant applications (even from senior faculty) are funded after the first submission. Think of the reviews you receive as an opportunity to improve your research!

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I. **Introduction**

This guide, from the University of California, Riverside, is designed for graduate students in psychology in the United States. It may also be relevant to graduate students in other areas of social sciences, but the emphasis is on grant and fellowship funding opportunities most relevant to psychology graduate students and postdoctoral researchers. It was prepared by faculty and students as part of a graduate course on grant writing in psychology at UC Riverside in Winter 2007. Because funding opportunities and requirements change regularly, contacts, deadlines, and requirements should be verified.

For the purposes of this guide, funding is limited to fellowships and grants specifically linked to research and training activities. We do not review every possible opportunity, but focus on what we believe are best bets that apply to most graduate students in psychology. We do not discuss need-based or merit-based awards, financial aid, loans, scholarships, or other sources of support not tied specifically to research or training. Most Ph.D. granting universities in the United States provide some type of financial assistance. They also frequently provide small competitions for research grants and awards for travel to professional meetings. Grants and fellowships described here are not limited to students from specific universities.

The process of identifying grant and fellowship opportunities, determining eligibility, understanding guidelines for submission, developing a coherent and fundable proposal, and submitting (and often resubmitting) in a timely manner can be difficult to navigate. Although there are a number of helpful websites and publications, they may require access available only to students at that university (or those who have a pass code). This guide provides a basic overview of funding for psychology graduate students that describes predoctoral opportunities, and also provides guidance for postdoctoral and early career funding. We cover promising sources of funding, proposal development and submission, and strategies for success. We devote considerable time to discussing National Institutes of Health (NIH) opportunities, and we also review opportunities at other federal agencies and private sources. We have benefited greatly from the willingness of other psychology graduate students, postdoctoral fellows, and faculty to share their successful applications with us.

II. Where Do I Start?

- Why should I apply for fellowships or grants in psychology?

    There are several compelling reasons to apply for grants and fellowships in graduate school. First, funding can enable you to conduct your own independent research. Funds can also be used for travel to present at meetings, attend conferences, etc. Second, grants and fellowships are important for your c.v. and show that you are on the road to becoming a grant-active researcher. Third, there is often a natural sequence of grant activity beginning with fellowships and training opportunities, continuing during the post-doctoral phase, moving into small grants, and followed by larger research project grants. Beginning this cycle early will enable you to apply for the most appropriate funding across the different stages of your academic career. Below is an article in the APA Monitor by Lea Winerman (December, 2006).

In January, the National Institutes of Health (NIH) announced a new grant program called the "Pathway to Independence" award. The $400 million program will provide five years of funding for 150 to 200 promising new postdoctoral researchers each year. The goal is to help the young scientists begin independent research careers. The program stems from concern among NIH officials that young researchers might be having trouble competing with established researchers for limited funding, according to NIH Deputy Director for External Research Norka Ruiz Bravo, PhD. "The worry [is] that when the budget is tight, the new investigators will have a difficult time breaking into the field," she says.

Indeed, many researchers find applying for their first independent research grant a daunting task. "It scares people because grant applications can be long and complicated, but also because they worry they'll be judged against more senior researchers," says Mitchell Prinstein, PhD, a psychology professor at the University of North Carolina, Chapel Hill and co-author of the early-career guide *The Portable Mentor: Expert Guide to a Successful Career in Psychology* (Springer, 2005). New researchers can get over that hurdle, he says, by taking advantage of the many opportunities offered to them by funders like NIH, individual universities and groups such as APA.

Start small

Psychologist David DiLillo, PhD, studies the long-term effects of child abuse and neglect. As a postdoctoral researcher at the University of Missouri in the late 1990s, he studied the links between people's history of childhood abuse and their later marital relationships. DiLillo began by applying for two grants offered by the university's research office. Neither grant was large by the standards of a major study--each provided about $10,000-but together they gave him enough money to collect promising pilot data. Such funds, often doled out by university research offices, can be an excellent resource for new researchers who aren't ready to apply for larger grants from agencies like NIH, says DiLillo, who is now a professor at the University of Nebraska-Lincoln. The university grants can be less competitive, he says, and some may even be held for young researchers.

"A lot of times funds like these are specifically earmarked for junior faculty because they want to help people jumpstart their research programs," DiLillo says. "They're investing in you." APA divisions and other organizations that focus on specific research interests can also provide seed money for collecting pilot data, says Prinstein. For example, AP1\s Div. 20 (Adult Development and Aging) offers a $1,500 postdoctoral research grant each year, and Div. 53 (Society of Clinical Child and Adolescent Psychology) offers $5,000 to one postdoctoral researcher each year.

Think big

With pilot data and other preparation in hand, it's time to start thinking of going after bigger research grants, says DiLillo. There are several programs that can ease the way for new researchers taking this next step. DiLillo's first big grant, for example, was a K award; a five-year research award from NIH that can provide up to $50,000 per year for project expenses. There are several different types of K awards, and DiLillo's-from the National Institute of Mental Health-was a KO1, which is a mentored grant aimed at new researchers. DiLillo is working with four mentors, each of whom provides feedback and expertise in a different area of his project, including content and statistical analysis.

Prinstein took a slightly different route. His first major grant was an R01 research grant from NIH. R01 grants are the standard NIH grants that most researchers—including more experienced ones—apply for. However, Prinstein tapped a program that allows scientists to designate themselves "new investigators" on the grant application. "Then when we're considering the grant, we can adjust our expectations for the amount of previous publications and such," Ruiz Bravo says. "Obtaining an NIH grant early in one's career serves as a record of the quality of one's research—getting a foot in the door early on is good for that reason."

- What are the different types of funding available (e.g., grants, fellowships, dissertation awards, scholars programs)

  A *grant* provides money to an eligible entity (such as a university) for a designated investigator (researcher) to carry out a specific approved project. A *fellowship* provides support for an individual for specific training and research activities. A *dissertation award* provides funding for specific tasks related to the dissertation research. *Scholars programs* typically provide research and training support for a group of students whose research fits within specific guidelines. Funds for predoctoral and postdoctoral training may also be received through an academic department whereby students can apply for these *traineeships* through their departments (if the department has a training grant). Although it is possible to receive more than one award (for instance, a training award for data collection not linked to the dissertation, and then a dissertation award), you cannot receive funding for the same tasks from multiple agencies.

  It is also important to recognize the difference between funding *requests for applications (RFA)* that are tied to specific amounts of money already designated for this support and applications that are submitted under specific *program announcements (PA)* that are not specifically linked to set-aside funds. Keep in mind that program announcements (PA) typically describe new, ongoing, or expanded interest or high-priority programs, but generally do not have set-aside funds. In contrast, RFA solicited proposals typically have set-aside funds for a certain number of awards (RFA) or one-time competitions (called Request for Proposals or RFP). Most funding agencies require that investigators respond to a solicitation or announcement, although there are "parent" announcements that support investigator-initiated research.

- When should I apply and how do I know if I am eligible?

  A first step in the funding process is to determine your eligibility as well as whether you qualify for grants and fellowships specific to certain groups (e.g., minorities, students with disabilities, etc.). This requires that you read program information very carefully, check with your advisor and other faculty members, and contact the designated program officer before you begin to prepare your application or proposal. The ideal timing to apply also depends on the specific requirements of the funding mechanism, your progress in graduate school, your own career plans, and whether you can resubmit a proposal that is not funded. Most applications for predoctoral training and dissertation research should be prepared mid-way through your graduate career (although some are designed for beginning students), in order to allow enough time for you to formalize your ideas, become well versed in the literature, and collect pilot data or perform research in a lab, but also to allow you time to revise and resubmit and still carry out the proposed project before you receive your dissertation (with the exception of post-doctoral training applications). The time from submission to review can be between 6 and 10 months. Remember that many applications can only be submitted on selected dates, so that the process of submitting and resubmitting may take quite a while.

- What are the major obstacles to grant writing and how can I overcome them?

"It's such an overwhelming task"
Probably the biggest obstacle to writing grants and fellowships is that it seems to be an overwhelming task to many students. There is an array of information available from your school's grants and contracts office, websites, department information, your advisor, and other students. Simply sifting through this information can seem daunting. Further, once you have identified a potential funding source and application process, the sheer amount of detail and work to complete as required is difficult to imagine. How can you overcome this obstacle? As with all complex tasks, it is important to approach grant writing one step at a time. You should first develop your research ideas carefully (and related training needs). Next you should identify viable sources of funding and consult with others about the specific procedures to follow. Another strategy for simplifying this process is to talk with others who have been successful and gather copies of successful applications for the funding source you are interested in.

"I don't have time"
This problem is not limited to applying for grants and fellowships. Graduate students and faculty typically juggle multiple tasks which makes it difficult to find time for everything (or sometimes for anything). But fellowships and grants almost always are submitted by specific deadlines. One strategy is to select a deadline and allocate an appropriate amount of time before that deadline to focus almost exclusively on preparing your application (which will require having already collected pilot data, reviewing the literature, etc.). This time will be specifically for putting it all together and writing the proposal. Some students find it helpful to create a timeline and ask their advisor to help them meet each deadline. You must also leave enough time for your department and university to process your submission.

"I don't have any pilot data"
Grants and fellowships that emphasize a research plan often require some type of pilot data. For doctoral students, this is usually collected as part of the second year or master's project, or collected in collaboration with your advisor. It is not necessary to have an accepted publication based on this pilot data, but it is important to make a case for your proposed research based on work you have already done (or ongoing work in your lab). Pilot data is particularly important if you are using new measures, novel situations, or participants from different ethnic or cultural groups (compared to previous studies).

"My area of research is hard to get funding for"
It is true that certain areas of research come into vogue for funding, often linked to specific advances in the fields, pressing social problems, or political winds. These concerns are often more pronounced for large-scale research projects. Remember that funding for predoctoral and postdoctoral students is linked primarily to the student and his or her capacity for success in academia. A strong academic record and clear career trajectory are very important!

"It's just too much responsibility to have to worry about grants, budgets, reports, etc.— I just want to get through graduate school!"
But you also want to start a successful career, and grant funding is important!

- What is my advisor's role in the grant and fellowship process?

As with all research and training activities, you should always consult regularly with your advisor. Predoctoral applications benefit by one or two years in your advisor's research lab, although some fellowships are for beginning graduate students only. For most fellowships with a training component, your training plan will be written in collaboration with your advisor. In some cases (for instance, NSF dissertation grants), your advisor must submit as the Principal Investigator (PI) on your behalf and you will be the Co-PI.

- What is the review process?

  Many foundations will assign reviewers to read and write a review of your proposal; in some cases, the reviewers meet to discuss their comments and in other cases the recommendations are sent to the foundation and evaluated by a specific committee appointed by the foundation. Applications to federal institutes are reviewed by committees comprised largely of academic researchers. Proposals under Program Announcements typically are reviewed by standing committees which may or may not be made public. For example, rosters for NIH committees are found on the agency website; however, NSF does not publish rosters. For NIH, you can request a specific committee at the time of submission in a cover letter. This makes sense if you find a review committee that has people who are working in your area. If you do this, it is a good idea to cite their work in your literature review. In most all cases, you will receive written and detailed reviews of your proposal. These will be very important in preparing a resubmission (when allowed). It is important to think of your reviews as helpful advice!

- Can foreign students apply for federal grants?

  Traineeships and fellowships are only awarded to U.S. citizens or permanent residents. Dissertation research funding from NSF does not require U.S. citizenship or residency.

  In addition, you don't need U.S. affiliation or citizenship to apply for a research project grant – including research project grants (R01), small grants (R03), or exploratory/developmental grants (R21). Applications are accepted from foreign institutions, from non-residents at foreign institutions, and from non-residents at U.S. institutions. However, most federal grants are awarded to domestic institutions.

  If you are working at a U.S. institution that is receiving the award, you have to remain there long enough to finish your project. Important things to consider are:
  - If you do not have a permanent visa, state in your application that your visa will allow you to remain in the U.S. long enough for you to be productive on the project.

  - Your institution ensures that you have an appropriate visa.

  - If your visa doesn't cover the entire grant period or you cannot guarantee that you will be getting one that does, you may not be allowed to be the PI. Alternatively, your institution could nominate a PI to replace you if you have to leave.

  There are some private fellowships available to foreign students (such as the American Association of University Women International Fellowship).

- Can you send an application to more than one federal agency?

  You may not send the same application to more than one Public Health Service (PHS) agency at the same time. You can apply to an organization outside PHS with the same application, but the PHS agency will not fund you if you get that award. However, unless otherwise stated, there may be overlap between grant applications to different agencies if the overlap is described and a disclaimer is provided stating that funding will not be provided for duplicate research.

- What are my chances of success and how can I improve them?

  Success rates vary by source of funding, typically hovering between 10% and 30%. As an example, the graph below illustrates number of F31 (predoctoral fellowship) the National Institutes of Health (NIH) applications reviewed and awarded. As you can see, the submission rate has increased significantly over the last decade, although funding levels have increased only slightly. One way to improve your chance of success is to resubmit when appropriate and to be persistent!

  As another example, the National Science Foundation (NSF) receives approximately 40,000 proposals in all areas and funds about 11,000. Approximately 1,000 graduate fellowships are awarded each year from several thousand applications. If you search carefully on most websites you can determine number of grants received and number funded each year to determine success rates.

Number of Fellowship (F31) Applications Reviewed and Awarded
Fiscal Years 1990 – 2005
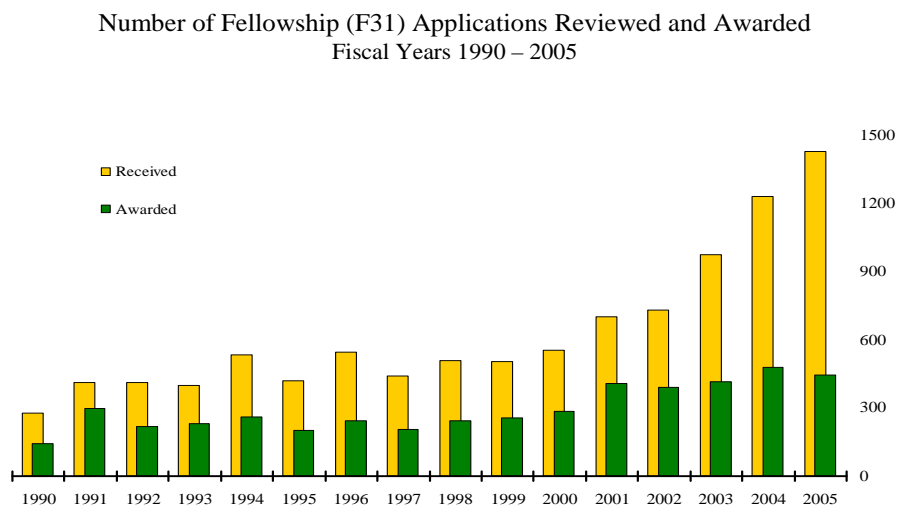
III. The Top Five: Best websites for learning about predoctoral and postdoctoral opportunities in psychology

Some websites cover a wide range of opportunities and include a search engine for most appropriate grants (after relevant user information is entered). Other websites are more specific to psychology or to a specific institute. Federal government websites related to major sources of funding are also extremely useful. It is helpful to look at multiple websites to decide which ones are best for your needs. The "Top Five" were selected by graduate students in this course (descriptions written by Rachel Miller):

#1 BEST WEBSITE: (Grapes) http://www.gdnet.ucla.edu/grpinst.htm
This site was a clear winner—everyone had it in their top 3. It provides several sources for Grad and postdoc students, especially for extramural support. It also offers direction for entering and continuing grad students. It provides a toolbar that links an individual to updated information about GRAPES grants. There is an easy search form with the availability of adding exclusions. Only limitation is lack of a keyword search.

#2 BEST WEBSITE: (Iris) http://www.library.uiuc.edu/iris
This site had seven 2nd place nominations, but did not make everyone's top rankings. It is dedicated to students at the University of Illinois at Champaign-Urbana, but most universities allow their students to access with a pass code. There is also a one-month free trial. There is a good data base, alert service, and weekly updates of funding opportunities.

#3 BEST WEBSITE: (Cornell) http://www.gradschool.cornell.edu/?p=132
This website allows you to search for fellowships in specific subject areas, with specific deadlines, or by keyword. You can't refine your search a great deal (e.g., no eligibility restrictions), but it was very user-friendly. It allows funding to be found based on research interests.

#4 BEST WEBSITE: (APA) http://www.apa.org/apags/members/scawards.html
This website was ranked in the top five by about half of the students in our graduate class, but it was always # 4 or #5. It provides a great listing of psychology related fellowship and award opportunities. It offers all the information about where to send applications and what to send. They seem to be small awards, but money is money.

#5 BEST WEBSITE: http://www.grantsnet.com
A number of graduate students really liked this site but others didn't like it. It has lots of information with featured grants and funding news. It's like the Wal-Mart of grant search engines. It has a lot of programs, but doesn't help you set limits to your search. It also doesn't show actual deadlines or requirements, so you have to go to the websites and figure it out. It may be a little tricky and tedious for a busy graduate student, but if you can get past this it is probably worth your effort. You can also save searches.

Other websites to consider: Beyond the top five websites above, students had very different preferences and likes. You may need to use a campus computer to access. Here are some to look at, including federal websites:

http://www.gsas.harvard.edu/current_students/the_graduate_guide_to_grants.php

http://www.nyu.edu/pages/gsas/GIGS/gsas/socialscience/Psychology.html

http://www.lib.msu.edu/harris23/grants/3psych.htm

http://www.grad.nd.edu/gfd

http://www.fundingopps.2.cos.com

FEDERAL AGENCIES:

www.nih.gov (National Institutes of Health)

http://grants.nih.gov/grants/grant_tips.htm for specific grant writing tips at NIH

http://www.crisp.cit.nih.gov/ for a list of funded PHS grants by topic and type (***important)

www.nsf.gov (National Science Foundation)
http://www.nsf.gov/funding/education.jsp?fund_type=2 for graduate student funding info

www.cdc.gov (Centers for Disease Control and Prevention)

www.ojp.usdoj.gov/nij/funding.htm (National Institute of Justice)

For UC Riverside Students:

There are a number of resources available to graduate students, postdocs, and faculty on the UCR Office of Research website, including links to GRAPES, IRIS, federal notices, and postings from foundations, the State of California, and UCOP. It can be accessed via the main website, www.ucr.edu

IV. The National Institutes of Health (NIH)

A. NIH: Overview and Organization (Example: NIMH)

B. Summary of NIH Training, Career Development, and Related Programs
- Ruth L. Kirschstein National Research Service Awards for Individual Predoctoral Fellows (F31)
- Ruth L. Kirchstein National Research Service Award for Individual Postdoctoral Fellows (F32)
- Institutional Predoctoral/Postdoctoral Training Grants   (T32)
- Mentored Research Scientist Development Award (K01)
- Pathways to Independence (K99/R00)

C. Summary of F31 Predoctoral Fellowship Guidelines for Graduate Students

D. Beyond Fellowships: Summary of Research Grants Program
- Small Research Grant Program (R03)
- Exploratory/Developmental Research Grant (R21)
- Research Project Grant (R01)

A. NIH Overview and Organization (website: www.nih.gov)

The National Institutes of Health (NIH) is the primary Federal agency for conducting and supporting medical research, focused on ways to prevent disease as well as causes, treatments, and cures. NIH research is relevant to child and teen health, minority health, women's health, wellness, and other health-related concerns.

Program announcements (PA) and Request for Applications (RFA) specify participating institutes. Applicants for funding will be routed to the most appropriate institute or center.

NIH is comprised of 27 Institutes and Centers:

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)

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)

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)

Example: The National Institute of Mental Health (NIMH) funds a large percentage of the research in psychology. The mission of the National Institute of Mental Health (NIMH) is to reduce the burden of mental illness and behavioral disorders through research on mind, brain, and behavior. According to the NIMH website, "Investments made over the past 50 years in basic brain and behavioral science have positioned NIMH to exploit recent advances in neuroscience, molecular genetics, behavioral science and brain imaging; to translate new knowledge about fundamental processes into researchable clinical questions; and to initiate innovative clinical trials of new pharmacological and psychosocial interventions, with emphasis on testing their effectiveness in the diagnostically complex, diverse group of patients typically encountered in front-line service delivery systems. NIMH-funded investigators also seek new ways to translate results from basic behavioral science into research relevant to public health, including the epidemiology of mental disorders, prevention and early intervention research, and mental health service research."

The NIMH provides leadership at a national level for extramural research on brain, behavior, and mental illness. (*Extramural research* is research conducted by scientists outside of the NIMH.) The institute funds extramural research project and research center grant awards and contracts to individual investigators in fields related to its areas of interest and to public and private institutions. NIMH also maintains and conducts a diversified program of intramural and collaborative research in its own laboratories and clinical research units at the National Institutes of Health. (*Intramural research* is research conducted by scientists who work at NIMH.)

NIMH Extramural research areas are organized within programs that fall in five separate research divisions.

Division of Neuroscience and Basic Behavioral Science (DNBBS)
Supports research programs in basic neuroscience, genetics, basic behavioral science, research training, resource and technology development and drug discovery.

Division of Adult Translational Research and Treatment Development (DATR)
Supports translational research on the mechanisms of adult psychopathology and the development of novel treatment approaches for adult mental disorders.

Division of Pediatric Translational Research and Treatment Development (DPTR)
Supports integrated research and research training that translates knowledge from basic/behavioral science into a better understanding of pediatric psychopathology and the development of novel treatment and prevention strategies.

Division of AIDS and Health and Behavior Research (DAHBR)
Supports research on mechanisms and interventions on the interrelationship of physical and mental health and includes the Center for Mental Health Research on AIDS.

Division of Services and Intervention Research (DSIR)
Supports research that evaluates the effectiveness of treatment and preventive mental health interventions and mental health services research.

B. Summary of NIH Training, Career Development, and Related Programs

It is the mission of NIH to discover new knowledge that will lead to better health for everyone. A critical part of this mission is the education and training of the next generation of biomedical and behavioral scientists.

Training—Individual Fellowships

- *(F30) INDIVIDUAL PREDOCTORAL NATIONAL RESEARCH SERVICE AWARDS FOR M.D./Ph.D. FELLOWSHIPS* are designed to help ensure that highly trained physician/scientists will be available in adequate numbers and in the appropriate research areas and fields to meet the Nation's biomedical research needs.

- *(F31) RUTH L. KIRSCHSTEIN NATIONAL RESEARCH SERVICE AWARDS FOR INDIVIDUAL PREDOCTORAL FELLOWSHIPS* are designed for promising applicants with the potential to become productive, independent investigators in the scientific mission of the NIH. Predoctoral training support is available for doctoral candidates who have successfully completed their comprehensive examinations or the equivalent by the time of award and will be conducting dissertation research. Longer-term awards for up to five years of graduate training and research are available for individuals with disabilities and members of ethnic minority groups.

- *(F32) RUTH L. KIRSCHSTEIN NATIONAL RESEARCH SERVICE AWARDS FOR INDIVIDUAL POSTDOCTORAL FELLOWS are designed for promising postdoctoral students* with the potential to become productive, independent investigators in fields related to the scientific mission of the NIH.

Training—Institutional Fellowships

- *(T32) NIH NATIONAL RESEARCH SERVICE AWARD INSTITUTIONAL RESEARCH TRAINING GRANTS.* Faculty at the training institution apply for these grants. If the institution has a training grant, faculty select students to participate who are pursuing a research doctorate (predoctoral traineeships) or who have recently completed their doctoral studies, including physicians (postdoctoral traineeships).

- *(T34) NIMH CAREER OPPORTUNITIES IN RESEARCH (COR) HONORS UNDERGRADUATE RESEARCH TRAINING GRANT* is intended to strengthen research and research training experiences of undergraduate minority students in scientific disciplines related to health. Again, the institution must have received this award in order to provide funding to students.

Research Career Development Grants

NIH offers a series of research career development grants to individuals who have the potential to become outstanding investigators and to those who, later in their careers, have demonstrated the capacity to continue to be exceptionally creative scientists and mentors to younger researchers. These grants provide a portion of salary support to free time for the conduct of research.

Four types of awards are designed for persons who require further mentoring in order to become outstanding, independent investigators:

- *(K01) Mentored Research Scientist Development Award* is designed for beginning investigators who have had a research doctorate and some postdoctoral research experience.
- *(K08) Mentored Clinical Scientist Development Award for Clinicians* is designed for beginning investigators with a clinical doctorate and some postdoctoral clinical experience;
- *(K23) Mentored Patient-Oriented Research Career Development Award* is designed for clinically trained professionals who have made a commitment to focus their research endeavors on patient-oriented research, and who have the potential to develop into productive clinical investigators.
- *(K25) Mentored Quantitative Research Career Development Award* is designed to foster the career development of investigators with quantitative scientific (such as: mathematics, statistics, computer science, informatics, physics, chemistry), and engineering backgrounds outside of biology or medicine who have made a commitment to focus their research endeavors on behavioral and/or biomedical research (basic or clinical).

Other K Mechanisms.

- *(K99/R00) NIH Pathway to Independence (PI) Award* is intended to help investigators to receive an R01 award earlier in their research career. It will provide up to five years of support consisting of two phases. The initial phase will provide 1-2 years of mentored support for highly promising, postdoctoral research scientists. This phase will be followed by up to 3 years of independent support contingent on securing an independent research position.

C. Summary of F31 Predoctoral Fellowship Guidelines

The Ruth L. Kirschstein National Service Award for Individual Predoctoral Fellowship (F31) provides predoctoral training support for doctoral candidates who have completed their comprehensive examinations or the equivalent by the time of award and will be performing dissertation research and training. The applicant should provide evidence of potential for a productive research career based upon the quality of previous training and academic record.

The applicant must propose a dissertation research project and training program which falls into a research area within the scientific mission of the NIAAA, NIBIB, NIDCD, NIDA, NIMH, or NINDS. The research training experience must enhance the applicant's conceptualization of research problems and research skills, under the guidance and supervision of a committed mentor who is an active and established investigator in the area of the applicant's proposed research. The research training program should be carried out in a research environment that includes appropriate human and technical resources and is demonstrably committed to the research training of the applicant. The application must include evidence that current and ongoing instruction in the principles of responsible conduct of research will be incorporated into the proposed research training plan. Fellowship awardees are required to pursue their research training on a full-time basis, devoting at least 40 hours per week to the training program. The F31 fellowship supports research training applied toward preparation of a dissertation and does not support study leading to the M.D., D.O., D.D.S., Psy.D., or similar professional degrees.

The Ruth L. Kirschstein National Research Service Awards for Individual Predoctoral Fellowships to Promote Diversity in Health-Related Research (F31) will provide up to five years of support for research training leading to the Ph.D. or equivalent research degree, the combined M.D./Ph.D. degree; or another formally combined professional degree and research doctoral degree in biomedical, behavioral, health services, or clinical sciences. These fellowships will enhance the diversity of the biomedical, behavioral, health services, and clinical research labor force in the U.S. by providing opportunities for academic institutions to identify and recruit students from diverse population groups to seek graduate degrees in health-related research and apply for this fellowship. The overall goal of this program is to increase the number of scientists from diverse population groups who are prepared to pursue careers in biomedical, behavioral, social, clinical, or health services research.

This announcement seeks to stimulate the participation of individuals from the following groups: (a) individuals from underrepresented racial and ethnic groups; (b) individuals with disabilities; and (c) individuals from socially, culturally, economically, or educationally disadvantaged backgrounds that have inhibited their ability to pursue a career in health-related research.

Application forms for F31 (uses PHS 416-1) are available online at www.http://grants.nih.gov/grants/funding/416/phs416.htm.

Who is Ruth L. Kirschstein?
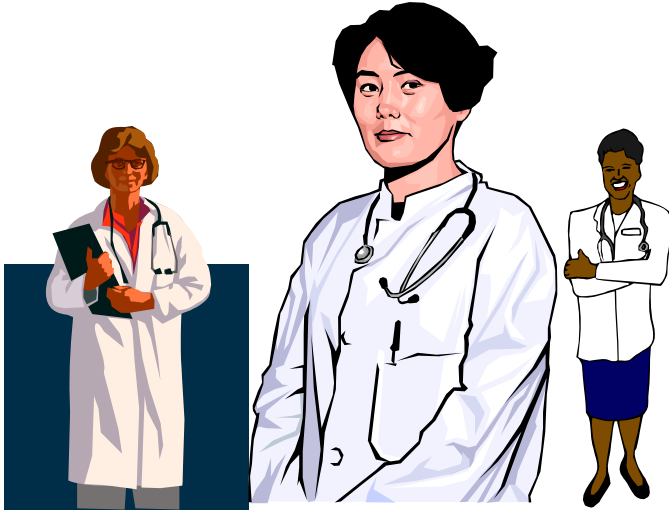
(From the Maryland Women's Hall of Fame website):

Ruth L. Kirschstein is currently the Deputy Director at the National Institutes of Health. She served as Acting Director from 2000 to 2002. She has had a long and distinguished career in directing and guiding biomedical science. Dr. Kirschstein received her medical degree and honorary degree from Tulane University School of Medicine. She interned in medicine and surgery at Kings County hospital and did residencies in pathology at Providence Hospital, Detroit, Tulane University Hospital, and the Clinical Center at the National Institutes of Health. She also received honorary degrees from the University of Rochester School of Medicine, Long Island University, Atlanta University, the Medical College of Ohio, and the Mount Sinai School of Medicine.

Dr. Kirschstein is a member of the Institute of Medicine and a fellow of the American Academy of Arts and Sciences. The Ad Hoc Group for Medical Research Funding renamed the NIH's National Research Service Award after Dr. Kirschstein, for her service to the nation, commitment to future generations of scientists and for her brilliant career.

D. Beyond Fellowships: Summary of Research Grants Program

Predoctoral and/or postdoctoral support from fellowships or traineeships provides an important first step in the funding process that begins in graduate school or shortly after. However, it is not necessary to have a fellowship or traineeship in order to apply for NIH research program grants.

As shown in the table that follows, there are a number of different types of research grants (or grant mechanisms). Two types of grants that are particularly well-suited for junior investigators are the R03 and R21 mechanisms. R03 supports small projects that can be carried out in a relatively short time. Funding and time for research is also limited to two years at up to $50,000 per year (direct costs). R21 supports innovative and exploratory research. Studies appropriate for R21 funding are often pilot studies or small research projects, but more funding is available than for R03 grants, with up to $275,000 available for two years. However, not all centers and institutes provide support for the R03 and the R21 mechanism.

For AREA grants or R15 small grants, eligibility is determined for your university based on federal dollars received—you must check with the contracts and grants office to determine whether you are eligible. For example, UCR has too much research funding to be eligible for these grants.

Remember, the research grants on the following table require that you have a Ph.D. However, NIH is committed to supporting new investigators. Towards this end, they encourage new investigators to self-identify in a special box on the application face page so they can be given special consideration. This means that peer reviewers are asked to focus more on the proposed approach than on the investigator's track record and to expect less preliminary data.

NIH Research Grant Mechanisms (from nih.gov)

Activity	Description
Research Grants	
Traditional Research Project Grant (R01)	**Research Project Grants** are awarded to eligible institutions on behalf of a principal investigator to support a discrete project related to the investigator's area of interest and competence. These grants make up the largest category of NIH funding.
Small Research Grant (R03) http://grants.nih.gov/grants/funding/r03.htm	**Small Research Grants** support small research projects that can be carried out in a short period of time with limited resources for projects such as pilot or feasibility studies; secondary analysis of existing data; development of research methodology and/or technology.
Academic Research Enhancement Award (AREA) (R15) http://grants.nih.gov/grants/funding/area.htm	**Academic Research Enhancement Awards** provide support to scientists at eligible domestic institutions for small-scale health-related research projects, such as pilot research projects and feasibility studies; development, testing, and refinement of research techniques; and similar discrete research projects that demonstrate research capability. Award is directed toward those smaller public and private colleges and universities that provide undergraduate training for a significant number of the U.S. research scientists.
Exploratory/Developmental Research Grant (R21) http://grants.nih.gov/grants/funding/r21.htm	**Exploratory/Developmental Research Grants** seek to broaden the base of inquiry in fundamental biomedical research by encouraging applications for research projects that involve an especially high degree of innovation and novelty. NIH provides pilot-scale support for potentially ground-breaking ideas and methods that meet the following criteria: they lack sufficient preliminary data for feasibility to be established, their successful demonstration would have a major impact on biomedical research, and they fall within the areas supported by the awarding I/C.
Small Business Innovation Research Grant (SBIR: R43/R44) **Small Business Technology Transfer Grant (STTR: R41/R42)** http://grants.nih.gov/grants/funding/sbir.htm	**SBIR and STTR grants** are made to eligible domestic for-profit small business concerns conducting innovative research that has the potential for commercialization.
Program Project Grant (P01)	**Program Project Grants** are more complex in scope and budget than the individual basic research (R01) grant. While R01s are awarded to support the work of one principal investigator who, with supporting staff, is addressing a scientific problem, program project grants are available to a group of investigators with differing areas of expertise who wish to collaborate in research by pooling their talents and resources. Program project grants represent synergistic research programs designed to achieve results not attainable by investigators working independently. Not all ICs accept P01 applications.
Research Center Grant (P50/P60)	**Research Center Grants** serve varying scientific and IC-specific purposes, but they have elements in common. The grants are multidisciplinary in scope and may focus more on an area or discipline of science than on a specific theme or goal. Independent investigators direct the projects and cores. Center grants offer a greater opportunity for scientific interactions and overall progress than with individually-funded projects. Not all ICs accept P50/P60 applications.
Scientific Meeting Support (R13) http://grants.nih.gov/grants/funding/r13/index.htm	NIH provides support for scientific meetings, conferences, and workshops that are relevant to its scientific mission. Any U.S. institution or organization, including an established scientific or professional society, is eligible to apply.

V. Centers for Disease Control and Prevention

A. Overview and Organization (website: www.cdc.gov)

The CDC is one of the major operating components of the Department of Health and Human Services. It was originally founded in 1946 to help control malaria. Over the years, it has become a leader in public health efforts to prevent and control infectious and chronic diseases, injuries, workplace hazards, disabilities, and environmental health threats. CDC has adopted an action oriented approach that involves the application of research findings to improve people's daily lives and respond to health emergencies.

The CDC is organized into the Office of the Director, the National Institute for Occupational Safety and Health, and six Coordinating Centers/Offices:

- Coordinating Center for Environmental Health and Injury Prevention (CCEHIP)
- Coordinating Center for Health Information Service (CCHIS)
- Coordinating Center for Health Promotion (CoCHIP)
- Coordinating Center for Infectious Diseases (CCID)
- Coordinating Office for Global Health (COGH)
- Coordinating Office for Terrorism Preparedness and Emergency Response (COTPER)

B. Grant Opportunities

CDC Anouncements of funding opportunities (FOA) are posted on their website (http://www.cdc.gov/od/pgo/funding/FOAs.htm).

These announcements specify the Coordinating Center/Office linked to the opportunity, and are listed as Program Announcements (PA, PAR, PAS) and specific requests for applications (RFA) (see glossary). As part of the PHS, CDC uses the same grant mechanisms as NIH, including R03, R21, and R01. They have recently added K01 awards for early career mentorship. CDC does not use the F31 or F32 training mechanism, but frequently supports dissertation research projects to cover up to one year of dissertation related expenses (including stipend).

The National Center on Injury Prevention and Control (under the Coordinating Center on Environmental Health and Injury Prevention) funded three dissertation research awards in 2006:

Yragui, Nanette Oregon Health & Science University Disparities at work: Intimate Violence Survivors and Work-related Outcomes

Chauhan, Preeti University of Virginia Female Juvenile Offenders: Differentiating Mechanisms of Violence Risk by Race

Fung, Michelle T. University of Southern California Understanding Psychopathy in a Multi-Ethnic Sample of Male and Female Adolescents

VI. The National Science Foundation (NSF)

A. Overview and Organization (website: www.nsf.gov)

The National Science Foundation (NSF) is an independent federal agency (not part of PHS) created to promote the progress of science. It has an annual budget of over 5 billion dollars, and is the funding source for approximately 20% of all federally supported basic research in U.S. universities. NSF is the major source of federal support for fields such as mathematics and computer science. It funds research and education in most fields of science and engineering through grants and cooperative agreements. **Important note: NSF does not fund any research that has a clinical or health direction.**

NSF fulfills its mission by issuing limited-term grants -- currently about 10,000 new awards per year, with an average duration of three years -- to fund specific research proposals that have been judged the most promising by a rigorous and objective merit-review system. Most of these awards go to individuals or small groups of investigators. Others provide funding for research centers, instruments and facilities for cutting-edge research.

The agency does not operate laboratories or conduct intramural research itself but does support National Research Centers, user facilities, certain oceanographic vessels and Antarctic research stations. The Foundation also supports cooperative research between universities and industry, US participation in international scientific and engineering efforts, and educational activities at every academic level.

Most NSF funding opportunities are divided into broad program areas:

- Biological sciences
- Computer and Information Sciences
- Crosscutting Programs
- Education
- Engineering
- Geosciences
- International
- Math, Physical Sciences
- Polar Research
- Science Statistics
- Social, Behavioral, Economic Sciences

Applications for research grants (beyond graduate training and dissertation) typically are in response to specific program solicitations within each program area. These solicitations specify due dates, amount of funding, etc. In some (but not all) cases, a letter of intent is submitted; only the most meritorious applications are selected and invited to submit a full proposal. For guidelines to submit NSF proposals, see http://www.nsf.gov. Go to the Funding link, then to the Grant Proposal Guide (61 page PDF file available).

B. Graduate Research Fellowship Program

(http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=6201&org=DGE)

The NSF Graduate Research Fellowship Program (GRFP) provides three years of support (usable over five years) for graduate study leading to research-based master's or doctoral degrees and is intended for students who are at the early stages of their graduate study. This mechanism is only appropriate for students who are about to enter graduate school or are in their first year (see eligibility below). Students must be in science, technology, engineering, or mathematics. The funding ($40,500) covers stipend, tuition, and a one-time travel grant. Approximately 1000 awards are given each year.

Applications are due in November, although the specific dates vary by program areas.

Eligibility: There are three eligibility requirements for the Graduate Research Fellowship Program -- citizenship, degree requirements, and field of study.

- Applicants must be U.S. citizens or nationals, or permanent resident aliens.
- Fellowships are intended for individuals in the early stages of their graduate study. ***Applicants must have completed no more than twelve months of full-time graduate study at the time of their application.*** Individuals are typically eligible to apply during the senior year of college or prior to or during the first year of graduate school.
- Fellowships are awarded for graduate study leading to research-based master's or doctoral degrees in the fields of science, technology, engineering, and mathematics supported by the National Science Foundation

Application Process: Fellowship applications must be submitted electronically using the NSF Fastlane Graduate Research Fellowship Program Application Module at http://www.fastlane.nsf.gov/grfp/

Applicants must first register as a Fastlane user at that web site. The *official* transcript(s) is due at the same time as the field of study and must be submitted to the GRF Operations Center at the address shown in this section. See the **Applicant User Guide** for instructions on completing and submitting an application.

The **Fastlane Application Module** includes the following information: Personal Profile, Education and Work Experience, Planned Graduate Program, Personal Statement, Previous Research Experience, Proposed Plan of Research, and References. Students should not send other extraneous information or materials such as CDs, manuscripts, resumes, medical reports, or news clippings as they will not be reviewed with the application.

C. SBE Doctoral Dissertation Research Improvement Grants
(http://www.nsf.gov/sbe/ses/ssociety/ssdiss1.jsp)

The SBE Doctoral Dissertation Research Improvement Grants are for individuals working on their dissertation in the social, behavioral and economic sciences (sbe). The awards are not intended to provide the full costs of a student's doctoral dissertation research, but to cover costs the university would not provide. Funds may be used for valid research expenses which include, but are not limited to, conducting field research in settings away from campus that would not otherwise be possible, data collection and sample survey costs, payments to subjects or informants, specialized research equipment, analysis and services not otherwise available, supplies, travel to archives, travel to specialized collections and facilities or field research locations, and partial living expenses for conducting necessary research away from the student's U.S. academic institution. Funds are limited to $8000 for up to 24 months. Approximately 200-300 awards are given each year. Applications can be submitted twice a year, although the specific months and dates vary by program areas.

Eligibility: Doctoral students eligible to apply have to be enrolled in U.S. graduate programs and must have passed -- or will pass -- the qualifying exams and completed all course work required for the degree prior to receiving the award. It is also preferred that students should have had their Ph.D. topic approved by their Ph.D. dissertation committee prior to receiving the award.

Two points are worth noting: First, students do not have to be U.S. citizens or permanent residents but only have to be enrolled in a U.S. graduate program. Second, the proposal must be submitted by the dissertation advisor (PI) on behalf of the graduate student.

Application process: Proposals submitted in response to this program solicitation should be prepared and submitted in accordance with the general guidelines contained in the NSF Grant Proposal Guide (GPG). The complete text of the GPG is available electronically on the NSF website at: http://www.nsf.gov/publications/pub_summ.jsp?ods_key=gpg. Applications must be submitted electronically through either fastlane or grants.gov.

VII. Other Sources of Private and University Grant and Fellowship Support

Private organizations (such as foundations and membership groups) and universities provide a range of opportunities, including awards for predoctoral, dissertation, and postdoctoral research and training. Support generally is limited to specific groups of individuals (women, ethnic minorities, economically disadvantaged students) or to specific areas of focus within the organization. University support typically is limited to students at that university, although some postdoctoral programs are open to students who have completed their doctoral degree elsewhere. The following are examples of some potential sources of funding.
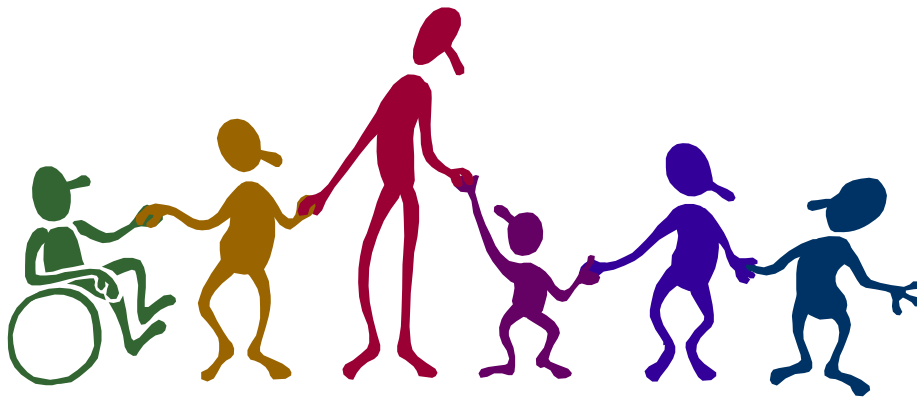
Opportunities emphasizing diversity include:

A. The Ford Foundation Diversity Fellowships Program.
http://www7.nationalacademies.org/fordfellowships/

The Ford Foundation Diversity Fellowships are designed to increase the diversity of the nation's university faculties by increasing ethnic diversity, maximizing the benefits of diversity, and encouraging faculty to use diversity as a resource for enriching student education. Approximately 60 predoctoral awards are given at $20,000 per year for up to three years, approximately 35 dissertation awards are given at $21,000 for one year, and approximately 20 postdoctoral awards are given at $40,000 for one year. Applications are due online in the late fall (see website for details). Materials submitted include a personal statement, proposed plan of graduate study, statement of previous research, dissertation abstract (for dissertation awards), letters of reference, transcripts, and GRE scores.

Eligibility. Some of the more important requirements for eligibility include U.S. citizen or national (not open to permanent residents who are citizens of other countries), enrolled in a Ph.D. or Sc.D. program (not open to terminal master's students), superior academic achievement, ability to utilize three years of support including a year of coursework, commitment to a career in research and teaching at the college or university level, commitment to diversity. Membership in one or more of the following ethnic groups is considered a positive factor: Alaska Natives (Eskimo or Aleut), Black/African Americans, Mexican Americans/Chicano(a)s, Native Pacific Islanders (Polynesian/Micronesian), and Puerto Ricans.

Academic discipline. Ford Foundation supports fellows from a range of disciplines including American studies, anthropology, archaeology, art and theater history, astronomy, chemistry, communications, computer science, earth sciences, economics, engineering, ethnomusicology, geography, history, international relations, language, life sciences, linguistics, literature, mathematics, performance study, philosophy, physics, political science, **psychology**, religion, sociology, urban planning, and women's studies.

Conference of Ford Fellows. A noteworthy feature of this fellowship program is the opportunity to meet and work with other fellows as a step towards professional advancement. The Conference of Ford Fellows provides:
- A unique national conference of a select group of high-achieving scholars committed to diversifying the professoriate and using diversity as a resource
- Networking with peers and "elders"
- Face to face conversations with university and academic presses
- Publication workshops
- Strategies to complete the dissertation
- Planning an academic career
- Career advancement workshops
- Proposal, grant-writing, and research funding advice
- Paper and poster presentations with supportive comments and critiques from colleagues
- Opportunities to identify mentors and peers from across the country
- Opportunities to interact with established and emerging scholars in diverse fields

B. American Psychological Association (APA) Minority Fellowship Program http://www.apa.org/mfp

The APA minority fellowship program (MFP) is designed to increase knowledge of issues related to ethnic minority mental health and improve mental health treatment for minority populations. This program is available to individuals pursuing (or completing) doctoral degrees in psychology and neuroscience. Application deadlines are usually in August. Predoctoral fellowships provide up to three years of support, travel funds to meetings, summer programs, and other opportunities for professional development. Postdoctoral fellowships provide two years of support.

The **Diversity Program in Neuroscience Predoctoral Fellowship** provides predoctoral research fellowships (up to three years of funding) in neuroscience.

The **Diversity Program in Neuroscience Postdoctoral Fellowship** provides postdoctoral research fellowships in neuroscience.

The **Mental Health and Substance Abuse Services (MHSAS) PredoctoralFellowship** is aimed at those pursuing doctoral degrees in clinical, counseling, and school psychology, or other mental health services areas.

The **MHSAS Postdoctoral Fellowship** is aimed at early career doctoral recipients who are interested in developing a career in mental health services research.

Eligibility. Citizenship or permanent resident alien status. For mental health services fellowships, students should be from APA accredited clinical, counseling, school, or other programs associated with the delivery of mental health services. Applicants must demonstrate a strong commitment to a career in ethnic minority mental health and substance abuse services. For neuroscience fellowships, students should be from appropriate, non-clinical Ph.D. programs. Members of under-represented minority groups are encouraged to apply.

C. The Paul and Daisy Soros Fellowships for New Americans
www.pdsoros.org

The Paul and Daisy Soros Fellowships provide funding for "new Americans" and is open to graduate students who have not completed more than their second year of graduate school. These awards provide support for partial tuition plus $20,000 per year for two years.

Eligibility. These fellowships are only open to U.S. citizens or permanent residents who are considered "new Americans." This includes resident aliens with a green card, naturalized U.S. citizens, or two parents who are both naturalized citizens. Applicants must be under 30 years old. As part of the application process, two in person interviews are conducted with previous fellows.

Opportunities emphasizing gender and women's issues include:

D. American Association of University Women (AAUW)
http://www.aauw.org/fga/fellowships_grants/index.cfm

AAUW has a number of opportunities for women at various stages of their careers. Programs support both U.S. citizens/permanent residents and international students who are not citizens or permanent residents. These are listed on their website. Candidates may only apply for one award. Those described below are particularly relevant for graduate students. Predoctoral and dissertation awards are $20,000 for one year; postdoctoral support is $30,000.

American Fellowships support women doctoral candidates completing dissertations or scholars seeking funds for postdoctoral research leave from accredited institutions. Applicants must be U.S. citizens or permanent residents. Candidates are evaluated on the basis of scholarly excellence, teaching experience, and active commitment to helping women and girls through service in their communities, professions, or fields of research.

Postdoctoral Research Leave Fellowships offer one-year support for women who will have earned a doctoral degree by a specified deadline. Postdoctoral fellowships are available in the arts and humanities, social sciences, and natural sciences; one is designated for a woman from an underrepresented group in any field. Limited additional funds may be available when matched by the fellow's institution.

Dissertation Fellowships are available to women who have completed all course work, passed all required preliminary examinations, and received approval for their research proposal or plan prior to deadlines stated in the application. Students holding any fellowship for writing a dissertation in the year prior to the AAUW Educational Foundation fellowship year are not eligible. Open to applicants in all fields of study, except engineering. Scholars engaged in researching gender issues are encouraged to apply.

International Fellowships are awarded for full-time study or research to women who are not United States citizens or permanent residents. Both graduate and postgraduate study at accredited institutions are supported. Six of the awards are available to members of International Federation of University Women affiliate organizations. These fellowship recipients may study in any country other than their own.

E. Radcliffe Institute for Advanced Study (Radcliffe Fellowship Program) (postdoctoral)
http://www.radcliffe.edu/fellowships/

The Radcliffe Institute for Advanced Study provides support for early postdoctoral, advanced postdoctoral, junior faculty, and senior faculty women scholars in creative arts, humanities, social sciences, and natural sciences. Awards of up to $60,000 are provided for one year in residence (in Boston) at the Institute. The Institute is committed to the study of women, gender, and society; however, the research need not focus on gender. Over 700 applications are received each year and approximately 45 fellowships are awarded.

Opportunities linked to specific organizational interests include:

F. W. T. Grant Foundation Scholars Program (postdoctoral).

http://www.wtgrantfoundation.org/info-url_nocat3042/info-url_nocat.htm

The William T. Grant Scholars Program supports promising early career researchers from diverse disciplines. The award is intended to facilitate the professional development of early career scholars who have some demonstrated success in conducting high quality research and are seeking to further develop their skills and research program. Studies from these Scholars contribute to theory and policy/practice for improving the everyday settings of youth.

Candidates are nominated by a supporting institution and must submit five-year research plans that demonstrate creativity, intellectual rigor, and a commitment to continued professional development; are grounded in theory and sound research methods; and provide evidence for appropriate mentoring from senior investigators. Every year, four to six William T. Grant Scholars are selected and each receives $350,000 distributed over a five-year period.

The W.T. Grant Foundation supports research to understand and improve settings for youth ages 8-25 in the U.S. Important settings include schools, youth-serving organizations, families, neighborhoods, and peer groups. There is a specific interest in understanding how settings work and how research is used to influence policies and practices that affect youth's settings.

G. Spencer Foundation Dissertation Fellowships.

http://www.spencer.org/programs/fellows/dissertation.htm

Spencer Foundation sponsors a Dissertation Fellowship Program to encourage scholars from a wide range of fields to undertake research relevant to the improvement of education. The dissertation topic must be relevant to education, but graduate study may be in any academic discipline or professional field including psychology. Fellowships in the amount of $25,000 are provided for up to two years of funding to complete the final analysis and writing of the dissertation. Applicants do not need to be U.S. citizens or permanent residents, but must be attending a university in the U.S.

Opportunities connected with Universities include:

H. University of California President's Postdoctoral Fellowship Program
http://www.ucop.edu/acadadv/ppfp/

The University of California offers a post-doctoral fellowship for applicants holding the Ph.D. degree from an accredited university (this does not have to be a UC). Applicants should expect to have earned their Ph.D. degree by June 30th of the year for which they are applying. If from a UC campus, they can apply to continue working at the same UC as their graduate work. UC policy limits total time of service in postdoctoral appointments to five years. President's Postdoctoral Fellows are expected to (1) take up residence at the campus of their postdoctoral appointment, (2) focus full-time on research and avoid other commitments such as teaching, (3) meet regularly with their faculty mentor, (4) attend two annual meetings. Each year approximately 28 awards are made.

Applications are due in November. The annual award is for $40-50,000, depending upon the field and experience. The award includes stipend, health, vision and dental benefits, and up to $4,000 for research-related expenses. Each award is a for a 12-month period, renewable for one year upon demonstration of academic productivity and participation in program events. Fellows in the Humanities, Social Sciences and Biological Sciences will receive $34,500-$36,000.

The program gives special consideration to candidates whose record of scholarship and service will contribute to the diversity of the academic community. The program also will give special consideration to applicants who have demonstrated significant academic achievement by overcoming barriers such as economic, social or educational disadvantage. The program is particularly interested in applicants whose family members may have experienced barriers to participation in higher education, who are bilingual or bicultural, or who have participated in teaching, mentoring or outreach programs (for example, MESA or Puente) that are designed to foster the participation of educationally disadvantaged students in higher education. Preference is given to candidates whose research emphasizes issues such as diversity, multi-culturalism and communities underserved by traditional academic research. The program is particularly interested in research which considers issues such as race, ethnicity and/or gender as they relate to traditional academic fields. This includes research in such areas as community development, social justice, educational reform, economic development, public health and safety, and the dynamics of multi-cultural communities.

VIII. Writing Successful Proposals

A. General Strategies for Successful Proposals

Identifying funding sources and grant mechanisms. To write a successful grant application for any agency or foundation, you need to understand the granting philosophy and guidelines of the funding agency *and* the specific requirements for the particular grant mechanism you are applying for. So the first questions you should ask are: (a) Is this the appropriate agency for my proposal? (b) Is this the appropriate funding mechanism for my proposal?

Read carefully the mission of the agency and guidelines for submissions. For instance, NIH and CDC have as a primary mission the improvement of public health. If your planned research has health implications (and within the institutes or centers of the agency), then these agencies are appropriate. However, it is also important that the specific request you are making matches the guidelines of the funding mechanism. For instance, if you are applying for fellowships emphasizing diversity (such as the Ford Foundation fellowships), then it is important that your background and proposed research address these issues. When in doubt, you should contact the program officer to review what you plan to propose.

Convincing reviewers of the merits of your proposal. Proposals are also typically reviewed by a panel or group of scholars who are reasonably knowledgeable about the research area of your proposal. To succeed, you will have to be at least as knowledgeable as they are. Consider the reviewers to be "informed strangers." A primary function of your proposal is to persuade the review group that what you plan to do stands out in terms of conceptual innovation, methodological rigor, and substantive content. Remember that the review group has to choose among or rate many highly competitive proposals. Reviewers also can't read your mind—if you don't write it in the proposal, they won't know about it. You must include enough detail to convince them your hypothesis is sound and important, your aims are logical and feasible, you understand potential problems, and you can properly analyze the data.

The typical peer reviewer:

- has a breadth and depth of knowledge and a vested interest in ranking applications in an unbiased and fair manner based on likely contribution to knowledge.
- may not be extremely familiar with all techniques used in a grant. All parts of the grant must therefore be clear and written in such a way that a non-expert can understand them.
- may not know the applicant personally, or feel comfortable with his or her level of independence, knowledge of the field, ability to design experiments with appropriate controls, ability to decide what to do if proposed experiments don't work out, etc. It is the job of the applicant to convince the reviewer.
- may not fully understand the significance without a compelling argument.
- is capable of understanding preliminary data if presented.
- must read several applications in great detail and evaluate all of them. Therefore, the successful application is clear, precise, easy to read, and free of errors.

Basic questions reviewers ask about research proposals:

- How high are the intellectual quality and merit of the study?
- What are we going to learn as a result of the proposed project that we do not already know, i.e., what is its potential impact and why is it worth knowing?
- How novel is the proposal? If not novel, to what extent does potential impact overcome this lack? Is the research likely to produce new data and concepts?
- Is the hypothesis valid and is there evidence to support it?
- Are the goals or aims logical?
- Are the procedures appropriate, adequate, and feasible for the research?
- Is the investigator qualified to conduct the research?
- Are the facilities adequate and the environment conducive to the research?

Additional questions reviewers ask about training plans:

- Is the training plan distinct from the regular course of graduate study?
- Is the training plan feasible, i.e., can it be accomplished within time, funding, and geographic constraints?
- Will the training plan contribute significantly to the applicant's academic career?
- Is there appropriate coordination between research and training components?

Writing the proposal. Writing a grant or fellowship proposal is different from writing up the results of research. A major difference is that the proposal details what you *plan to do,* rather than reporting on work already completed. You must also take care to communicate effectively through clear and concise writing. Well-written proposals are organized, direct, concise, and carefully crafted to address the guidelines in the application. It is helpful to have several objective experts review your proposal before you submit it.

Writing Tips

- Prefer the active rather than the passive voice. For example, write "We will develop a cell line," not "A cell line will be developed."
- Keep related ideas and information together, e.g., put clauses and phrases as close as possible to - preferably right after the words they modify.
- Simplify and break up long, involved sentences and paragraphs. In general, use short simple sentences; they are much easier on the reader. Your goal is communication.
- Edit out redundant words and phrases. Edit and proofread thoroughly. Look carefully for typographical and grammatical mistakes, omitted information, and errors in figures and tables. Sloppy work will definitely suffer in review. Reviewers feel that if the application is sloppy or disorganized, the applicant's research may be as well.

B. Writing a Proposal for a Research Project Grant

The sections below are based on a typical NIH research project grant (R01), but are applicable to other research grants. They are based on information from nih.gov.

Title

- Make your title specific and detailed. If your application is a revision, do NOT change the title.
- Stay within the 56-character limitation (this includes spaces between words).

Developing the Hypothesis

- Most reviewers feel that a good grant application is driven by a strong hypothesis. The hypothesis is the foundation of your application. Make sure it's solid. It must be important to the field, and you must have a means of testing it.
- Provide a rationale for the hypothesis. Make sure it's based on current scientific literature. Consider alternative hypotheses.
- A good hypothesis should increase understanding of biologic processes, diseases, treatments and/or preventions.
- Your proposal should be driven by one or more hypotheses, not by advances in technology (i.e., it should not be a method in search of a problem). Also, avoid proposing a "fishing expedition" that lacks solid scientific basis.
- State your hypothesis in both the specific aims section of the research plan and the abstract.

Developing Your Research Plan

A top-quality research plan is the most important factor determining your application's success in peer review. As with a scientific publication, developing your ideas is key. Read the grant application kit carefully for specific elements to be included in the research plan. Before proceeding into specific sections of the plan, here are some general tips:

- Your application should be based on a strong hypothesis.
- Be sure your project has a coherent direction.
- Keep the sections of the plan well coordinated and clearly related to the central focus.
- Emphasize mechanism: A good grant application asks questions about mechanisms.
- Don't be overly ambitious - your plan should be based on a feasible timetable.
- Specific aims and experiments should relate directly to the hypothesis to be tested

PHS agency research plans include sections outlined in PHS 398 as follows:

A. Specific Aims (Should include 2-4 aims; length approximately 1 page)

- Your specific aims are the objectives of your research project, what you want to *learn*, not activities you plan to *conduct*. The project aims should be driven by the hypothesis you set out to test. Make sure they are highly focused.

- Begin this section by stating the general purpose or major objectives of your research in a brief introductory statement. You also want to catch reviewers' attention, so make sure this is well written and compelling.

- Be sure all objectives relate directly to the hypothesis you are setting out to test. If you have more than one hypothesis, state specific aims for each one. Keep in mind your research methods will relate directly to the aims you have described.

- Choose objectives that can be easily assessed by the review committee. Do not confuse specific aims with long-term goals.

B. Background and Significance (approximately 3 pages)

- Keep the statement of significance brief. State how your research is innovative, how your proposal looks at a topic from a fresh point of view or develops or improves technology.
- Show how the hypothesis and research will increase knowledge in the field. Relate them to the longer-term, big picture scientific objectives and to the betterment of public health.
- Justify your proposal with background information about the research field that led to the research you are proposing. The literature section is very important because it shows reviewers you understand the field.
- Use this opportunity to reveal that you are aware of gaps or discrepancies in the field. Show familiarity with unpublished work, gained through personal contacts, as well.
- Identify the next logical stage of research beyond your current application.

C. Preliminary Studies/Progress Report (approximately 6-8 pages)

By providing preliminary data, this extremely important section helps build reviewers' confidence that you can handle the technologies, understand the methods, and interpret results.

- Preliminary data should support the hypothesis to be tested and the feasibility.

- Explain how the preliminary results are valid and how early studies will be expanded in scope or size.

- Make sure you interpret results critically. Showing alternative meanings indicates that you've thought the problem through and will be able to meet future challenges.

- Preliminary data may consist of your own publications, publications of others, or unpublished data from your own laboratory or from others.

- Include manuscripts submitted for publication.

D. Research Design and Methods (approximately 13-15 pages)

Describe the experimental design and procedures in detail and give a rationale for their use. Organize this section so each experiment or set of experiments corresponds to one of your specific aims and is stated in the same order. Even holding to this structure, the experiments still must follow a logical sequence. They must have a clear direction or priority, i.e., the experiments should follow from one another and have a clear starting or finishing point.

Convince reviewers that the methods you chose are appropriate to your specific aims, that you are familiar with them, and that, unless innovative, they are well established. If your methods are innovative, show how you have changed existing, proven methods while avoiding technical problems. Describe why the new methods are advantageous to the research you propose to do.

More and more applicants are including colored charts, graphs, and photographs in their applications. If you must use color to get your point across, it is wise to also place a copy of the item in an appendix, noting this in the body of the text. (However, do not put important figures only in the appendix, or overly-reduced figures in the body of the application with enlargements in the appendix. The Research Plan must be self-contained. The appendix should not be used to circumvent the Research Plan page limits.) Many applicants are not aware that most of the study section members may receive only black and white photocopies of their original application. However, assigned reviewers do receive originals of the appendices (which is why five copies are requested) and usually receive original copies of the application as well. Now many applications are being distributed electronically.

Approach

- State why you chose your approach(es) as opposed to others.

- If you are choosing a nonstandard approach, explain why it is more advantageous than a conventional one. Ask yourself whether the innovative procedures are feasible and within your competence.

- Call attention to potential difficulties you may encounter with each approach. Reviewers will be aware of possible problems; convince them you can handle such circumstances. Propose alternatives that would circumvent potential limitations.

- Consider the limitations of each approach and how it may affect your results and the data generated.

- Spell it out in detail. While you may assume reviewers are experts in the field and familiar with current methodology, they will not make the same assumption about you. It is not sufficient to state, "We will grow a variety of viruses in cells using standard in vitro tissue culture techniques." Reviewers want to know which viruses, cells, and techniques; the rationale for using the particular system; and exactly how the techniques will be used. Details show you understand and can handle the research.

- Make sure any proposed model systems are appropriate to address the research questions and are highly relevant to the problem being modeled.

Results

- Show you are aware of the limits to - and value of - the kinds of results you can expect based on current knowledge of the subject. State the conditions under which the data would support or contradict the hypothesis and the limits you will observe in interpreting the results.

- Show reviewers you will be able to interpret your results by revealing your understanding of the complexities of the subject.

- Many applications benefit from statistical analysis. The early involvement of a statistician to determine the amount of data to collect and the methods for analyses will favorably impress reviewers.

- Describe your proposed statistical methods for analyzing the data you plan to collect. Define the criteria for evaluating the success or failure of a specific test.

E. Human Subjects

Assuring NIH human subjects are protected is a key responsibility of the applicant, in concert with the applicant's institution. Awards cannot be made until assurances are on file. If your proposed research does not involve human subjects, indicate this by noting "Not applicable in this appropriate section." Anyone reading your application will know immediately you have not just forgotten to complete this section. If your proposed research involves human subjects or samples from human subjects, read carefully and follow the Human Subjects Research section of the instructions. Include enough information so reviewers have no questions about what you propose to do. In addition, your research plan must be certified by your institution's institutional review board (IRB) prior to funding (unless exempt). Though IRB approval is not required at the time of application, you should start the process early because revisions and final approval can take time. Before an application can be funded, a Human Subjects Assurance must be on file with the Office of Human Research Protections (OHRP). Contact OHRP or your institutions grants and contracts office for details and help.

F. Vertebrate Animals

If the proposed research involves vertebrate animals, your project must be reviewed and approved by an institutional animal care and use committee (IACUC) prior to review, and an Animal Welfare Assurance must be on file with the Office of Laboratory Animal Welfare. See the instructions for item 5 of the face page of PHS 398 for further details.

G. Literature Cited

Refer to the literature thoroughly and thoughtfully but not to excess. The publications you cite need not be exhaustive but should include those most relevant to your proposed research. Research proposals typically do not fare well when applicants fail to reference relevant published research, particularly if it indicates that the proposed approach has already been attempted or the methods found to be inappropriate for answering the questions posed. Each citation must include the names of all authors (not et al.), name of the book or journal, volume number, page numbers (not first page only), and year of publication

C. Common Mistakes for Research Grant Proposals

The categories below are specific to the PHS 398 research grant format, but are applicable as general guidelines. In other words, although the format for grant applications may vary, most include some reference to significance of the work, aims or goals, research methods and data analysis, qualities of the applicant or investigator, and support from the institution.

Problems with significance:

- Not significant nor exciting nor new research

- Lack of compelling rationale

- Incremental and low impact

Problems with specific aims:

- Too ambitious, too much work proposed

- Unfocused aims, unclear goals, listing of activities rather than research objectives

Problems with experimental approach:

- Too much unnecessary experimental detail

- Not enough preliminary data to establish feasibility

- Little or no expertise with approach

- Lack of appropriate controls

- Not directly testing hypothesis

- No discussion of alternative models or hypotheses

- No discussion of interpretation of data

D. Writing an Application for an F31 Fellowship

The NIH F31 fellowship provides an example of funding for graduate students that combines support for both research and training. Accordingly, many of the criteria listed above for a research project grant are applicable to an F31 fellowship. The research proposal typically is the dissertation project, although the proposed research can go beyond the dissertation (or be in addition to the dissertation). It is understood that the applicant is a beginning scholar, and the committee evaluates the overall quality of the entire application. A common mistake that applicants make is that they do not adequately develop the training plan and/or link it to the proposed research. It is extremely important that the training plan be distinct from the regular graduate course of study and contribute significantly to the applicant's career development.

The NIH review of the F31 applications focuses on four substantive areas (candidate, research training plan, sponsor, institutional environment/commitment), a general summary and recommendation, and review of inclusion, monitoring, and human subjects protections. These areas are reviewed according to criteria described below.

Candidate: The objective of this section is to provide a concise assessment of the candidate's potential to become a productive researcher. Evaluation focuses on undergraduate and graduate performance (grades), prior and current research experience, publications, presentations at conferences and meetings, and comments by the sponsor and other referees.

Research Training Plan: The objective of this section is to assess both the proposed research and the adequacy of the training plan. The quality and significance of the proposed research is evaluated in terms of the theoretical underpinnings of the proposed work and the strengths and weaknesses of the research design. The training plan is evaluated in terms of linkages between objectives and proposed coursework and other advanced training (e.g., seminars, institutes, etc.). It is also evaluated in terms of connections with the proposed research, i.e., whether there is appropriate coordination between the research and training components. Further, the gender, minority, child inclusion, and human subjects compliance are assessed.

Sponsor. The objective of this section is to assess the appropriateness of the sponsor, his/her record of working with doctoral candidates, and his/her research record, publications, and overall stature in the field. Although there are some clear advantages to having more senior faculty as sponsors, the review committee considers the sponsor's research trajectory, such that more junior faculty are reviewed favorably if they have an ongoing and productive research agenda. The sponsor should also demonstrate clear commitment to the candidate's training goals.

Institutional Environment/Commitment: The objective of this section is to assess whether the sponsoring institution (your university) will provide resources needed to carry out the proposed research and training (e.g., lab space, computer time, facilities).

E. Common Mistakes for Fellowship Applications

Problems with the candidate:

- Poor academic record (low grades, few scholarly awards)

- Lack of clear focus or potential to become a productive research scientist

- Letters of recommendation are not very enthusiastic or supportive

Problems with the research training plan:

- Proposed research is vague, not clearly defined

- Overly ambitious, too much work proposed

- Weak methodology

- Proposed training plan does not significantly add to regular graduate training

- Training plan and research plan are not connected

Problems with the sponsor:

- Low commitment to candidate's proposed research and training

- Weak research record and few publications

- Commitment of sponsor cannot be overestimated! This is very important!!

Problems with the institutional environment/commitment

- Low commitment to candidate—few resources available and/or provided. This is very important!!

F. The Submission, Review, and Resubmission process

Submitting an application for funding. Preparing an application for submission is a time-consuming process that requires utmost attention to detail. Writing a high quality proposal narrative is essential; however, there are many other aspects of proposal preparation and submission that must be carefully carried out. Be sure to pay attention to proposal page length (is it double-spaced or single spaced?), font size, margins, deadlines for submission (are those based on mailing date or receipt date?), format for your biosketch or c.v., what should be included in the text vs. what should be in the appendices, and other details.

Most funding agencies require online submission (which is becoming the standard). You can get help with preparation of required forms, procedures, etc., from your department and/or your research contract and grants office. Talk to them and find out how they can help you. Also, don't be intimidated about contacting the funding agency for additional information.

Submission dates vary by agency and within agencies and depend on the specific funding mechanism. Some agencies have regular cycles; for instance, recently revised (2007) deadlines for first submissions of NIH R01grant applications are February 5, June 5, and October 5, and dates for R03 and R21 submissions are February 16, June 16, and October 16. F series fellowships (most relevant for graduate students) deadlines were recently shifted to April 8, August 8, and December 8. Program announcements and special funding requests often have different deadlines. Remember, deadlines are firm (and they often change)!

The review process. The review process varies across funding agencies. For example, foundations typically assign reviewers to read and write a review of your proposal. In some cases, reviewers meet and discuss applications while in other cases they are sent to the foundation and evaluated by a specific committee. Applications to federal institutes are reviewed by either ad-hoc committees (specially formed for a specific program announcement or request for proposals) or standing committees (regular membership groups). You can request a specific committee in a cover letter when you submit your proposal. Many governmental agency committee rosters are posted on the agency's website (NIH is but NSF is not).The time for the review process varies as well. Typical turn around time for federal agencies is 8-10 months. In most all cases, you will receive detailed reviews via email. These are very important to improve your proposal and prepare a resubmission (when allowed).

The resubmission process. It may take some time for you to look at your reviews and cope with any emotional responses. Then the task of revision begins. Guidelines for revisions (number of times allowed, etc.) vary across agencies so be sure to check these before you revise and resubmit. If you do decide to resubmit a revised application, be sure to answer all reviewer concerns. Be diplomatic and polite—if you differ in your opinion try to courteously convince the reviewers of your point of view (with justifications). Also, pay attention to updating or improving your application in response to new developments in your field. You may get the same reviewers for the revision but you may also get different reviewers who may have different concerns. There is usually a mechanism for highlighting revisions (for instance by using italics) and an opportunity to briefly summarize these revisions. Again, it is important to pay close attention to the guidelines for revisions. Remember, very few proposals are accepted the first time they are submitted! **PERSEVERANCE IS ESSENTIAL!**