

SPECIAL ARTICLE

Getting Funded

Career Development Awards for Aspiring Clinical Investigators

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For aspiring clinical investigators, career development awards provide a primary mechanism for “getting funded.” The objective of this article is to provide information that will facilitate a successful application for a research career development award. Specifically, we discuss important issues that cut across the diverse array of awards, and we highlight the most common sources of funding, including the unique opportunities that are available for underrepresented minorities. The target audience includes junior faculty and fellows who are pursuing or considering a research career in academic medicine, as well as their mentors and program directors.

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The opportunities and challenges of establishing a research career in academic medicine have never been greater.^{1,2} Among the primary challenges facing aspiring clinical investigators is securing extramural funding for research. While other pathways exist,^{3,4} competing successfully for career development awards is a primary mechanism for garnering the financial support necessary

to launch and sustain an academic career.³ Despite their importance, career development awards are often shrouded in mystery, with most information disseminated informally through word of mouth, program announcements, mentors, or academic institutions, rather than the published literature.

The objective of this article is to provide information that will facilitate a successful application for a research career development award. Specifically, we discuss important issues that cut across the diverse array of awards, and we highlight the most common sources of funding, including the unique opportunities that are available for underrepresented minorities. The target audience includes junior faculty and fellows who are pursuing or considering a research career in academic medicine, as well as their mentors and program directors.

CROSS-CUTTING ISSUES

While the specifications differ from one funding mechanism to another, there is a core set of issues that candidates must satisfactorily address when applying for a research career development award. These include identifying a mentor, garnering institutional support, formulating a career development plan, and developing a research plan.

Identifying a Mentor

Identifying and enlisting the support of an outstanding mentor is essential for ensuring a successful research career and a competitive career development award application. Therefore, a mentor should be chosen carefully for the following characteristics: has achieved national recognition for his or her research; provides timely feedback on manuscripts and grants; helps the mentee to identify and network with other nationally recognized leaders in the mentee's field; promotes the mentee's national reputation; helps to protect the mentee's time from burdensome clinical responsibilities and committee assignments; and allows the mentee to take credit for his or her successes. Ideally, the mentor should have a track record of mentoring other successful junior investigators. These individuals should be contacted to discuss their experience working with the mentor.

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Because a single person may not possess all of the desired characteristics of an outstanding mentor, candidates should consider identifying a second mentor or, in some cases, a team of mentors to meet their individual needs. For many research projects, particularly those that are multidisciplinary, methodologic and content expertise is required from several investigators and/or clinicians. A division chief or a department chair, moreover, may be the most appropriate mentor to help ensure that the candidate's time is protected for research and not overwhelmed by clinical and other responsibilities. On occasion, identifying a mentor at another institution may be advisable if comparable expertise is not available locally. When more than one mentor is listed, the roles of each must be clearly defined. Potential mentors who are so busy that they are frequently unavailable or respond slowly to e-mail or requests to review proposal drafts should be passed over for more accessible and responsive mentors.

Garnering Institutional Support

Letters of recommendation are required for most career development awards. Applicants should contact persons who are likely to write glowing letters. These individuals might include research collaborators, supervisors, or prior mentors. If asked to write drafts of their own recommendation letter, applicants should not be modest. Specific examples of achievements should be provided and personal characteristics that make one likely to succeed as an independent investigator should be cited, particularly those that are consistent with the program's stated goals. For example, if the funding agency indicates that its career development award is intended for "future leaders" in primary care, the applicant should cite particular examples or personal attributes that demonstrate his or her outstanding leadership qualities.

Applicants are often asked to describe features of the research environment that will help ensure their success. Examples include specific courses that will help the candidate achieve his or her research objectives, an established research infrastructure with well-trained research staff, and a successful track record of fostering multidisciplinary research and promoting clinical investigators to senior positions. In addition, it is important to convince reviewers that the institution is committed to the candidate. A letter of support from one's department chair or dean, with an explicit commitment that sufficient time (e.g., 50% to 80%) will be protected for research and that essential resources (e.g., office space and administrative support) will be provided, is especially helpful to convey this point.

Formulating a Career Development Plan

The career development plan provides a blueprint of the candidate's strategy for transitioning from a junior (i.e., mentored) to a senior (i.e., independent) investigator. A thorough description, with a detailed timeline, of how the award will facilitate the candidate's progress along this

path should be provided, including specific target goals for research productivity and manuscript preparation. The proposed plan should be concordant with one's career goals, should ensure the acquisition of essential knowledge and skills that will enable the candidate to successfully accomplish the stated research aims, and should describe how the candidate will gain increasing independence in his or her research, with the mentor ultimately playing a secondary role. If the goal is to acquire additional research skills, for example, the candidate might propose to take relevant courses, attend an advanced workshop at another institution, and work closely with senior investigators who have particular expertise in the desired content areas or methodologies. To demonstrate one's burgeoning independence, a credible plan for the submission of future grants, ideally building on the work proposed in the current application, should be provided.

Developing a Research Plan

The proposed research should address at least one important scientific question, should be directly relevant to the candidate's career objectives, should be a suitable vehicle for developing the research skills described in the career development plan, and should be technically sound and feasible, given the modest resources provided by most career development awards. The level of detail expected for the research plan is usually commensurate with the space allotted.

Although some variability exists across award mechanisms, the research plan usually consists of the following four sections: Specific Aims, Background and Significance, Preliminary Results, and Methods. The most important is the Specific Aims section, which should clearly articulate what the candidate is trying to accomplish and why. A disproportionate amount of time should be invested in developing and refining this section because the subsequent sections must flow logically from the specific aims. One strategy is to provide an overall objective, followed by more narrowly focused primary and secondary aims. If the research is hypothesis driven, at least one testable hypothesis should be included. Examples of this strategy are provided in Table 1.

In the Background and Significance section, the candidate should describe the scope and significance of the study problem and review the relevant literature, highlighting potential gaps and limitations of prior research. Attention to the published reports of potential reviewers is strongly encouraged, especially when this work is applicable to the candidate's research. A listing of members on the relevant study section or selection committee is often available from the program officer (or administrator) or from the program's web site. Whenever possible, a conceptual model that provides a theoretical framework for the proposed research should be presented. A schematic diagram, with arrows denoting the directionality of hypothesized relationships, is often helpful. An illustrative example is provided in Fig. 1.

Table 1. Examples of Hypothesis-driven Specific Aims

Overall objective	To further elucidate the mechanisms underlying the development of disability among community-living older persons.
Primary specific aim	To determine how often disability in basic activities of daily living develops insidiously, i.e., in the absence of a discernible precipitating event.
Secondary specific aim	To determine whether the likelihood of insidious disability differs on the basis of physical frailty.
Hypothesis	Insidious disability is more common among older persons who are physically frail than among those who are not physically frail.

Expectations regarding the inclusion of preliminary results differ for the various award mechanisms. A description of published and unpublished studies will help to establish the candidate's competence and experience in the relevant content area or methodology and will demonstrate the candidate's capacity to successfully complete a research project. The provision of pilot data, furthermore, will usually bolster the feasibility of the research plan. As an example, to support a proposal aimed at evaluating the risk and preventability of colonization and infection with antimicrobial resistant pathogens attributable to commonly used indwelling devices, one candidate presented published results from a preliminary study, documenting significant regional variation in the prevalence of resistant Gram-negative pathogens in the nursing home, and unpublished results from a small pilot survey of adherence to selected infection control practices among nursing homes in a single geographic region. On occasion, the Preliminary Results section can be used, at least in part, to describe relevant work completed by the candidate's mentor or an important collaborator. For example, a

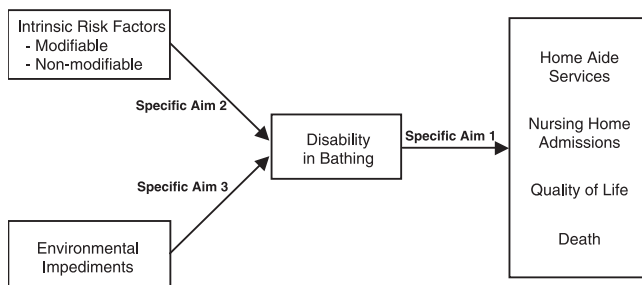


FIGURE 1. Example of a conceptual model for bathing disability. The associated hypotheses are: disability in bathing will be an independent risk factor for subsequent adverse outcomes; disability in bathing will be attributable to a combination of intrinsic risk factors and environmental impediments; and several of these intrinsic risk factors and environmental impediments will be modifiable and, hence, amenable to interventions designed to enhance independent bathing.

candidate who proposes to complete a series of secondary analyses might describe how the existing database has been previously used to successfully address other important scientific questions.

The Methods section should describe how the candidate plans to accomplish the specific aims of the proposed research. Information should be provided regarding the research design, study population, data collection procedures and instruments, key variables, and analytic plan, including sample size and power calculations when applicable. All critical decisions should be justified. Organizing the analytic plan according to the specific aims and/or hypotheses is often helpful. For complicated analyses, a biostatistician should be consulted. Applications are strengthened by some discussion regarding the quality of the data, including reliability and validity, and the generalizability of the anticipated findings. Candidates should discuss potential problems or pitfalls, and propose possible solutions and/or alternative approaches to handling them. The inclusion of a detailed timeline, denoting the projected start and completion of important study tasks, is highly encouraged. A research plan that has an unrealistic timeline or is overly ambitious will be viewed unfavorably.

After the research plan has been written and suitably revised, the candidate should complete the abstract or summary, if one is requested. Because this may be the only part of the application that is read by all reviewers, special attention is warranted. The abstract should provide a succinct and accurate summary of the research plan and describe how the proposed research will help the candidate to develop the desired research skills and accomplish his or her career objectives. In most cases, the summary should state the specific aims and hypotheses, highlight the significance of the proposed research, and provide the essential elements of the research methods, including the study design.

Optimizing Success

Preparation for a career development award involves identifying a focused area of research that is important and amenable to new discoveries, establishing a track record in this area, and subsequently developing a research agenda that offers an opportunity for further career development and can be achieved using the limited project resources of the award. The strongest candidates have generally received rigorous research training during their fellowship over a course of 2 to 3 years. Because fellowship projects can often serve as the launching pad for career development award applications, they should be selected carefully. Helpful advice on how to select a research project has been published elsewhere.^{5,6}

Applications for a research career development award should be clearly written, logically developed, and well organized. Candidates should review the application instructions carefully, with particular attention to the required headings, font size, page limitations, and other

specifications. To optimize success, candidates should begin working on their application several months before the deadline to allow sufficient time for writing and re-writing. The period of active writing should be preceded by thoughtful consideration and brainstorming with mentors about the study problem, specific aims, and hypotheses, and by a careful review of the literature. Candidates should solicit feedback from other content and methodologic experts, particularly those who are knowledgeable about the specific funding mechanism, and should contact prior award recipients for advice and to request a copy of their successful application. Finally, candidates should be attentive to even the smallest of details, because carelessness is often judged harshly by busy reviewers.

SOURCES OF FUNDING

Several potential sources of career development funding are available to aspiring clinical investigators. We focus here on awards sponsored by the National Institutes of Health (NIH), the Agency for Healthcare Research and Quality (AHRQ), and the Department of Veterans Affairs (VA) because "that's where the money is." We also describe the awards that are available specifically for underrepresented minorities. Finally, we discuss the advantages and disadvantages of applying to private foundations for career development support and offer advice on how best to pursue these sources of funding. Because deadlines and other award specifications may change over time, applicants should visit the relevant web site or call the program officer for the most current information. An extensive, but non-exhaustive, listing of career development awards is provided at <http://www.sgim.org/careerdevelopment.cfm>.

NIH Mentored K Awards

The NIH is the single largest source of career development funding. In 2002, 489 mentored career development awards, totaling over \$64 million per year, were awarded by the NIH to clinical investigators, with an overall success rate, including initial and revised applications, of about 50%. The two relevant mechanisms are the Mentored Patient-Oriented Research Career Development (K23) Award and the Mentored Clinical Scientist Development (K08) Award. The K23 Award supports patient-oriented research, for which the investigator directly interacts with human subjects, while the K08 Award supports health-related research that does not involve patients. The two awards are otherwise quite similar. Each provides 3 to 5 years of funding, with up to \$75,000 per year for salary support plus fringe benefits and \$25,000 per year for research support and supplies, although some variation across institutes may exist.

The NIH career development program offers several advantages. First, there are three funding cycles per year, with application deadlines of February 1, June 1, and October 1. Second, the review process is explicit, that is, each applicant receives a written critique by a panel of reviewers.

Third, applicants may revise and resubmit their proposal twice. Finally, receipt of a mentored K Award establishes a track record for future NIH funding. In a recent policy change, described at <http://grants1.nih.gov/grants/guide/notice-files/NOT-OD-04-007.html>, the NIH now allows K Award recipients to receive concurrent salary support from a competing NIH research grant when they are the principal investigator. Identifying the NIH institute or center that best fits their career goals and planned research is an important challenge for some clinical investigators. The largest number of mentored K awards are sponsored by the National Heart, Lung, and Blood Institute (NHLBI), followed by the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK), National Institute of Allergy and Infectious Diseases (NIAID), National Institute of Mental Health (NIMH), and National Cancer Institute (NCI).

Candidates for a mentored K Award should consider applying within 3 years of their first academic appointment (i.e., as a senior fellow, instructor, or assistant professor) and must apply before receiving their first R01 Award. Most successful applicants have at least two, first-authored research articles published or in press. During the planning phase of the application, candidates should carefully read the relevant program announcement, available at <http://grants1.nih.gov/training/careerdevelopmentawards.htm>, for specific instructions and should strongly consider contacting the program officer from the desired NIH institute or center to confirm the most appropriate award mechanism and discuss the specific provisions of the award. Candidates might also want to determine whether the institute or center is offering any special, time-limited awards in high-priority areas (RFAs), because these awards may have a higher salary cap. For candidates interested in aging-related research, the National Institute on Aging is now cosponsoring the highly successful Beeson Career Development Award. This unique award, which is described at <http://grants1.nih.gov/grants/guide/rfa-files/RFA-AG-04-004.html>, provides up to \$800,000 over 5 years for salary support and research expenses and is renewable for more junior investigators on a competitive basis for 2 years, with up to \$300,000 of additional funding.

Whenever possible, candidates should review applications that have already been funded, especially those in their area of interest. Funded applications can be easily identified using the CRISP database (<http://crisp.cit.nih.gov/>). While funded applications may be obtained from the NIH via the Freedom of Information Act (<http://www.nih.gov/icd/od/foia/>), it is generally preferable and faster to request a copy directly from the principal investigator, that is, the successful applicant.

The essential components and review criteria for mentored K Award applications are provided in Table 2. The training and research components should develop new knowledge and research skills in the scientific area that is relevant to the candidate's career goals. For example, a candidate interested in establishing preventive care guidelines for older persons with type 2 diabetes might propose

Table 2. Essential Components and Review Criteria for NIH Mentored K Award Applications

Component	Criteria for Review
Candidate	Quality of the candidate's academic and clinical record Potential to develop as an independent investigator Commitment to a research career
Career development plan	Likelihood that the plan will contribute substantially to the achievement of scientific independence Appropriateness of the content and duration of the plan for achieving scientific independence Consistency of the plan with the candidate's prior training and career goals
Conduct of research Research plan	Quality of the proposed training in the responsible conduct of research Scientific and technical merit of the research question, design, and methodology Relevance of the proposed research to the candidate's career goals Appropriateness of the plan to the stage of research development and as a vehicle for developing the desired research skills
Mentor/comentor	Adequacy of the plan's attention to gender and minority issues Appropriateness of research qualifications in the area of the application Quality and extent of the proposed role in providing guidance and advice to the candidate Previous experience in fostering the development of more junior researchers History of research productivity and grant support Adequacy of support for the proposed research project
Environment and institutional commitment	Adequacy of research facilities and training opportunities Quality and relevance of the environment for the scientific and professional development of the candidate Commitment to the scientific development of the candidate Commitment to an appropriate balance of research and clinical responsibilities, with a minimum of 75% protected time for research-related activities

formal coursework and research training in aging-related principles, cost-effectiveness analysis, and qualitative and decision analytic techniques. The candidate might also propose to complete a series of qualitative and quantitative studies aimed at evaluating the effectiveness and cost-effectiveness of varying levels of glucose control while accounting for patient-specific preferences and the presence of comorbid conditions.

AHRQ K08 Award

Compared to the NIH, AHRQ has funded a relatively small number of mentored career development awards during the past 3 years—9 in 2000, 6 in 2001, and 10 in 2002, reflecting an overall success rate of 47% (G. Drott, personal communication). Nonetheless, AHRQ is an important source of career development funding for clinicians who are interested in health services research for at least two reasons. First, support for health services research varies considerably across NIH institutes; and second, health services research often does not fit well within the disease-, organ-, or age-specific foci of the NIH institutes (e.g., research on patient satisfaction). AHRQ supports and conducts research to improve the outcomes, effectiveness, quality, access to, and cost and utilization of health care services. Current high-priority areas include patient safety, reducing medical errors, bioterrorism, and translating research into practice. Unlike the NIH, AHRQ offers the K08, but not the K23 Award. The application procedures for the AHRQ K08 Award are nearly identical to those described above for the NIH mentored awards. Complete details are available at <http://grants1.nih.gov/grants/guide/pa-files/pa-00-010.html>.

VA Mentored Awards

The VA has historically been the second largest source of career development funding for clinical investigators. Career development awards are currently offered through four services: Health Services Research and Development; Rehabilitation Research and Development; Laboratory Science Research and Development, which includes basic biomedical research and laboratory-based clinical research; and the newly established Clinical Science Research and Development, which includes patient-oriented research and epidemiologic studies. For the purpose of illustration, we focus here on awards offered through the Health Services Research and Development (HSR&D) program. Interested candidates should visit <http://www.va.gov/resdev> for details about comparable awards offered through the other three services.

The HSR&D program offers two mentored awards to support promising clinicians who are committed to careers in VA research—the Research Career Development (RCD) Award and the Advanced Research Career Development (ARCD) Award. Applicants for each must meet board certification requirements, be eligible for a research appointment under VA employment guidelines, and be citizens of the United States. Although candidates are not required to have a VA appointment at the time of application, they must have secured the support of a VA mentor and VA medical center. Prior funding from the VA or NIH does not preclude an application for a VA mentored award.

The RCD and ARCD Awards each provide 3 years of full salary support and require a minimum time commitment of 75% for research and training activities. For candidates

who have no other research funding, supplemental funds may be requested for research expenses, with a maximum stipend of \$10,000 and \$20,000 per year, respectively, for the RCD and ARCD Awards. Entry-level (RCD) candidates should be within 5 years of their last clinical training, fellowship, or terminal degree. Most successful applicants have at least one or two first-authored original research articles published or in press. Letters of intent (described below) for applicants who do not have a publication record are rarely approved. RCD awardees may apply for an additional 3 years of support through the ARCD program. Candidates should otherwise apply at the advanced level if they are more than 5 years beyond their last clinical training, fellowship, or terminal degree, or if their research accomplishments (i.e., publications) are beyond the entry-level criteria. Since 2000, approximately 30% to 40% of first-time RCD applications and 50% to 60% of first-time ARCD applications have been approved for funding. Resubmissions of unsuccessful applications are encouraged. Subsequent approval rates are usually higher than those for first-time submissions.

The key components and review criteria for the HSR&D mentored awards are similar to those provided in Table 2. In addition, the proposed research plan should be directly relevant to the veteran population, and applicants must demonstrate a strong commitment to health services research and a VA career. A common mistake is for applicants to focus too much attention on their prior accomplishments without clearly articulating how the proposed research and training experiences will help them achieve their career goals.

Before submitting a full application, candidates must have an approved letter of intent, which is a 1-page description of the career development plan, including career goals, proposed research, and plan for mentorship and training. Letters of intent are reviewed by HSR&D staff to determine whether the basic requirements are met and whether the mentor's expertise and the proposed research and training plan are appropriate. Letters are due by April 15 and October 15, and complete applications are due by June 15 and December 15, respectively. During the planning phase of the application, candidates should read the relevant guidelines carefully and contact the program officer with any unanswered questions. Complete details and application procedures for the VA HSR&D Career Development Awards are available at http://www.hsrd.research.va.gov/for_researchers/professional_development/.

Awards for Underrepresented Minorities

Several unique award opportunities are available for underrepresented minorities who are pursuing research careers in academic medicine. We focus here on awards offered by the NIH and the Robert Wood Johnson (RWJ) Foundation. Because the definition of minority investigator may differ depending on the specific award mechanism, interested candidates should contact the program officer at the relevant funding agency to confirm their eligibility.

NIH Research Supplements for Underrepresented Minority Investigators. Principal investigators with an eligible NIH research grant, including R01, P01, and P30 (among others), may apply for an administrative supplement to support a minority investigator, with the goal of enhancing the candidate's (i.e., trainee's) research skills for a career as an independent investigator. This funding mechanism has several attractive features. First, the application is relatively brief, consisting of a 3- to 4-page description of the proposed research and career development plan, along with supporting documentation. Second, an application may be submitted at any time. Third, the decision for funding is generally made within 8 weeks. Finally, the likelihood of success is extraordinarily high, with award rates across NIH institutes averaging over 80%. Each parent grant may support only one minority supplement, which, in turn, can provide up to \$75,000 per year for salary support plus fringe benefits and up to \$10,000 per year for supplies and travel. The length of a supplemental award depends on the amount of time remaining on the parent grant, although the maximum period of support is 4 years. Because a minority supplement provides an unusually good opportunity for procuring career development support, potential candidates should actively seek out senior investigators in their field who have an eligible NIH research grant. Complete details and application procedures are available at <http://grants1.nih.gov/grants/guide/pa-files/PA-01-079.html>.

The Harold Amos Medical Faculty Development Program of The Robert Wood Johnson Foundation.

This 4-year post-doctoral award supports promising physicians from historically disadvantaged backgrounds (i.e., ethnic, financial, educational disadvantage) who have completed their clinical training and are committed to research careers in academic medicine. The program is designed for individuals who are early in their academic career. Candidates who have been at the assistant professor level longer than 2 years are no longer eligible. Awardees may receive up to \$65,000 per year in salary support and \$26,350 per year in project support and are expected to spend at least 70% of their time in research activities.

During the first phase of the application process, which must be completed partially online, candidates are asked to submit a 1-page summary of their proposed research; a proposal narrative that describes their prior research training and experience (1 page), career objectives (1 page), and planned research training and activities (6 pages); a curriculum vitae; a biosketch and letter of support from their mentor; and three additional confidential letters of support. Based on a review of these materials, 24 semi-finalists are invited to give a 15-minute presentation to the National Advisory Committee (NAC), which consists of distinguished leaders in biomedical research. Up to 12 finalists are subsequently asked to submit a detailed research plan and budget. These materials are reviewed by the NAC, which makes final recommendations for funding to the Foundation. Complete details and application procedures are available at <http://www.mmfdp.org/>.

Foundation Awards

Private foundations provide an alternative source of career development funding for aspiring clinical investigators. Having a pending or previously unsuccessful application from another funding agency does not preclude an application to a private foundation. In the event that more than one application is successful, private foundations may allow the budget to be rewritten to avoid an overlap in funding. An advantage of applying to more than one funding source is that the work required to modify an existing application is substantially less than that required to write an entirely new proposal. With more than one application, moreover, the overall likelihood of success is enhanced.

Applications to private foundations are generally much shorter than those to the NIH, AHRQ, or VA, and less detail is usually required regarding the research plan. Although preliminary results are always important, prior published research may not be essential for some foundation awards. Finally, private foundations may be one of the few sources of funding for clinical research that is not highly valued by federal funding agencies, such as ethnography or history of medicine.

A disadvantage of foundation awards is that applicants often receive little or no formal feedback. In contrast to the NIH, AHRQ, or VA, private foundations usually do not provide written critiques, so applicants do not have the benefit of reviewers' comments if they decide to revise and resubmit their application. Another disadvantage of most foundation awards is the availability of only one funding cycle per year. Finally, many awards from private foundations focus on specific content areas, such as cardiology, or patient populations, such as older persons, thereby precluding applications from otherwise outstanding candidates who are working in other areas or populations.

Some foundation awards require an interview. Candidates should be well prepared. This can be achieved by speaking with previously funded applicants and/or the project officer to learn how the interviews are conducted and the nature of the questions that are typically asked. If the candidate has minimal experience with similar interviews, "practice" sessions with mentors and colleagues are highly recommended.

SUMMARY

For aspiring clinical investigators, career development awards provide a primary mechanism for "getting funded." When applying for a research career development award, candidates must identify a mentor, garner institutional support, formulate a career development plan, and develop a research plan. While the NIH is the single largest source of career development funding, the VA, AHRQ, and private foundations offer several attractive award opportunities. Additional unique career development programs are available for underrepresented minorities.

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References

1. Larson EB. General internal medicine at the crossroads of prosperity and despair: caring for patients with chronic diseases in an aging society. *Ann Intern Med.* 2001;134:997-1000.
2. Wolf M. Clinical research career development: the individual perspective. *Acad Med.* 2002;77:1084-8.
3. Chin MH, Covinsky KE, McDermott MM, Thomas EJ. Building a research career in general internal medicine: a perspective from young investigators. *J Gen Intern Med.* 1998;13:117-22.
4. Applegate WB, Williams ME. Career development in academic medicine. *Am J Med.* 1990;88:263-7.
5. Saha S, Christakis DA, Saint S, Whooley MA, Sjgion SR. A survival guide for generalist physicians in academic fellowships part 1: getting started. *J Gen Intern Med.* 1999;14:745-9.
6. Kahn CR. Picking a research problem. The critical decision. *N Engl J Med.* 1994;330:1530-3.