Navigating NIH Programs to Advance Your Career

>> Okay, so I'm going to talk about navigating NIH programs to advance your career. The topics that I'm going to cover are an overview of NIH Institutes and Centers and the total NIH operating budget, the NIH research training website and funding across the career path and an overview of NIH programs. I'll also focus on the NRSA, new programs for early career investigators, career development awards, research project grants for early-stage investigators and established investigators and program grants and then some updates on early-stage investigators, ESIs and ESI extension policies and resources and then finally updates on the loan repayment programs, so the overview is that NIH includes 27 institutes and centers, but 24 of them are extramural funding centers, and these are shown here in blue in the middle panels. The overall NIH operating budget in FY 2019 was $36 billion, and of this, 59 percent went to research project grants, two percent to research training grants and two percent to career development, seven percent to research centers, so I'll focus on these different areas. Just some advice for navigating NIH programs: review IC priorities and goals. Each NIH institute or center has different research, training and career development programs. Identify the specific grant programs offered by each of the NIH institutes or centers. Learn the NIH application review process, and then one of the things that I've mentioned quite a bit to extramural entities is, make early contact with program officers to ensure that their NIH institute and center is the correct match, and the best way to do this is to send a short e-mail to schedule the time to contact the program officer. Also, for any grant, it may be more applicable to Fs and Ks but also even for R01 equivalents or RPG, find innovative, well respected mentors and collaborators who will help with the preparation of the grant, and then propose your best and most creative ideas. So this is the NIH research training website. It was launched in 2015. It's a very useful resource for trainees, post-ops, potential K award applicants and early stage faculty, but it has these panels across the career path from undergraduate through to established investigators, and people can take a look and see what funding opportunity announcements are still active. This also shows a little more detail about the funding options across the career path from the training grants, fellowships through K awards and through many of the R01 or RPG awards, and I'll focus some detail on each of these. People can go to these various sites here like the loan repayment program, the diversity supplements and the re-entry supplements to actually check on the most recent funding opportunity announcements or information. So just about the diversity supplement, this is an administrative supplement to an existing, actively funded research grant, and it's designed to support candidates from diverse backgrounds, including those in underrepresented groups who wish to develop research capabilities in participating career development. The diversity supplement supports many career stages from undergraduate to faculty, and it often can be a bridge to a K Community Development toward the postdoctoral researchers or early stage faculty. The diversity supplement adds to ongoing research and career development with an expectation and a subsequent application for NIH support, and our goal is to enhance workforce diversity, so people should take a look at this most recent funding opportunity announcement. The other thing to notice is that there is a link that looks at every NIH Institute and Center because these grants are administrative and are reviewed by the NIH Institute and Center, and different institutes and centers have different deadlines and policies, so it's very important for anyone trying to put one of these in to be sure that, A, it's the right NIH Institute, and also when the deadlines exist. I did want to also mention the clinical trials policy because this is important. The definition of a clinical trial is a research study in which one or more human subjects are prospectively assigned to one or more interventions to evaluate the effects of the interventions on health-related biomedical or behavioral outcomes. The applications that need or require clinical trials information are ones with due dates on after January 25th, 2018, and so anything that is submitted after that, which obviously is now, involving clinical trials, must be submitted to an FOA or a request for application, RFA, that states it will accept clinical trials. Grant applications which include clinical trials led by the investigator must complete a clinical trials form which can be accessed at this particular link. FOAs that accept clinical trials incorporate specific review criteria. R01 and individual career development or K awards have three options: independent clinical trials allowed, clinical trials not allowed, or the clinical trials research experience can be performed under the guidance of a mentor, and then there are basic experimental studies with humans or BESH, and I'll go through some of these FOAs in more detail because not every IC signs onto every K award FOA in particular. The training grants and the fellowship awards do not permit independent clinical trials, but clinical trials research experience under mentor guidance can be proposed, and that can be described in the research strategy section and mentor statement. The other thing that everybody should know about is, there is now an ORCID iD requirement for trainees, fellows and career development appointees or awardees. This was listed in the notice OD-19-109, and this is really to enhance career tracking. It's required as part of the appointment process for trainees and scholars supported on institutional grants, which are all listed here, and it's required at the time of application for fellowship and career development awards, and it's pretty much required for all of the R01 equivalent awards as well, so just to go into a little more detail, predoc and early postdoc training, it's the T32, the T35, F30, F31 and F32. The NRSA award's goals are to ensure a diverse pool of highly trained scientists in appropriate scientific disciplines to address the nation's biomedical, behavioral and clinical research needs. The institutional training programs, which are the T32 and T35, are institutional awards to support research training activities for predocs, medical or veterinary medicine students and/or postdoc trainees selected by the institution. The important thing to note, though, is that different T32s have some different requirements in terms of some being focused solely on predoctoral students, others being focused solely on postdoc, so it's important to check the existing FOAs. All of the training programs require a program director and experienced faculty to serve as mentors. The individual fellowships, or the F-Series, as they're called, require a primary sponsor. The F-30 is an award for combined clinical and research doctoral degree training. The F31 and the F31 diversity are awards for graduate students working towards a research doctoral degree, and the awards for postdoctoral fellows working towards research independence are the F32. These all have a primary sponsor as the individual who is overseeing the research, but I always recommend a comentor or a mentoring team to be part of this as well, and that can be included in the application. Awards to appointees to T awards or fellowship recipients must be US citizens or permanent residents, so what are the common features of NRSAs? Trainees and fellows, except for the T35 ... Well, actually, even for the T35, the time that they're allowed to put into that, they're required to pursue full-time research training 40 hours a week. The stipend, some good news about this is that in FY 2020, the postdoctoral stipends were increased by 5.4 percent, which was more than they've been increased in the past, and this was actually based on some input that was received in a recent National Academy report, and then the postdoctoral institutional allowance and training-related expenses increased to 11,850, particularly to better cover health insurance, and then predoctoral stipends were also increased by two percent. This just shows you the information about the tuition and fees, the institutional allowance, which I've already mentioned. We need to be sure that trainees and fellows can pursue clinical trials research experience, but they cannot lead an independent clinical trial. And then one of the important thing to know is that trainees and fellows may spend an additional 25 percent of their time, for example, 10 hours a week in part-time research, teaching or clinical employment paid from a different source in the NRSA, and this is outlined in NOT-17-095. These activities may enhance career development, and some of the reason that this was also implemented was, it's known that some of the time, the predoctoral stipends in particular may not be sufficient or equivalent to what the institution may want to provide, and so this additional time can actually help to enhance the stipends. So think about the institutional NRSAs, the T32s that are pre and postdoctoral that provide a strong foundation in research design methods and analytical techniques and enhance the trainees' understanding of health-related sciences. The T35 is a short-term training program to provide medical or clinical students, including DVM students with research experience, and encourage them to pursue research careers. As mentioned before, but I think it's really important to know, all training grants are restricted to domestic US institutions, and the trainees must be citizens, noncitizen nationals who have been lawfully admitted for permanent residence by the time of the appointment, so this just provides a list of the currently active T32 programs. Anyone who wants to go through these and look to see if this fits with their research experience is fine, and also, as I mentioned, it's always good to actually contact the program officer who is listed on these particular FOAs and ask them if this really does relate to what you're proposing in terms of your research experience. The individual NRSA and fellowships, the F30 is to promote dual degrees and do PhD, and that's primarily the ones that are supported on this, but the others with a dual degree can also be supported on the F30. One of the important parts about the F30 is that individuals have to have been enrolled in a dual-degree clinical program no more than 48 months prior to the initial application and must already have identified a dissertation project and a sponsor, and at least 50 percent of the award period must be devoted to full-time graduate research training leading to the research doctoral degree. The F31 predoc supports doctoral research candidates who have identified a mentor and will be performing dissertation research. All ICs except NIGMS, NIBIB and Fogarty International Center and NCATS support the parent F31. The diversity F31 supports individuals from diverse groups underrepresented in the biomedical or behavioral sciences, and all IC except Fogarty and NCATS support the diversity F31. The typical time to apply for an F31 is when a thesis proposal has already been approved, and then that way, the individual who gets that award will have the resources to be able to go on and continue their research. The F32 supports mentored postdoctoral training under the guidance of a faculty sponsor. Fellows must already have a research or clinical doctoral degree from an accredited US institution. They can have it from a foreign institution, but they're still going to have to be a citizen or of permanent residence, and then the F32 is an integration program of research and mentor training to develop into an independent researcher. All IC except NINDS, National Library of Medicine, NCATS and ORIP and Fogarty support the parent F32, but, again, you can go to the website and look at F32s because, for example, NINDS has its own F32. All fellowships require references from individuals other than the primary mentor, so this is sort of important that whoever actually gives a reference has to be someone who knows the individual and has interacted with them before, but they can't be the primary mentor. So the R38 program is a relatively new program. It's a research in residency. It's called stimulating access to research in residency or the StARR program. The last due date was in February of 2020. It's not yet clear if it's to be renewed, although there is some discussion that this may occur, and this is currently funded by NHLBI, NCI, NIAID and the National Institute of Aging. The K38 Transition Scholar is a limited competition for those who were appointed to the R38, and this is also the FOA or RFA announcement that it's out there, and these are the due dates, and this can be transferable to a different institution than the R38. As of now, it's not clear how many individuals who were appointed to the R38 have applied to the K38, but we'll keep people posted about that. So this just gives an overview of the research in residency components. The research in residency program has a program director and research preceptors. This is pretty typical that it can be more than one residency program in a particular program, for example, internal medicine and pediatrics, and the reason for this is that it can be difficult to pull too many people from one particular program out of residency. The residency directors are involved and informed, although they're not the program director, and this includes skill building appropriate for MDs, MD/PhDs or others with clinical degrees. It's hypothesis-based experimental research, a board-approved plan, and short boot camps or workshops are encouraged to try and assist address research competencies. The research in residency requires 80 percent time for 1 year, and this is over the entire residency, so it can span multiple years of residency, and then the research and career development components are to get professional skills. They're in mentor development programs, and then there is an upcoming NIH workshop. It's going to be a virtual one where we're actually going to talk with the R38 directors, some of the appointees, and so this could be an interesting workshop, and then the Transition Scholar I've already talked about is for 2 years to provide research skills to transition to an independent K, so they're still allowed to apply for the other K awards: K01, K08, K23, and K08 and K23 are likely to be more relevant, or they can apply for a foundation award. So then if we think about the DP5, this is the NIH Director's Early Independence award. It supports exceptional investigators to pursue independent research directly after completion of their research doctoral degree or clinical residency, and they skip postdoctoral training and then get a DP5, which is sort of equivalent to an R01. It bypasses the traditional postdoctoral training and accelerates entry into an independent research career. The applicants must be within 12 months before or after receiving a research doctoral degree or completing clinical postgraduate training, and the awardees are expected to be competitive for continued funding for a permanent position after this DP5 award. Then I want to go to the K kiosk, so there's a K01, which is the Mentored Research Scientist Career Development Award, which is typically for PhDs and DVMs. The K01 is for the Mentored Clinical Scientist Research Career Development Award, and this is specifically for promising clinical scientists. The K23 is the Mentored Patient-Oriented Research Career Development Award, which is to provide support for clinically trained professionals who have made a commitment to patient-oriented research and have the potential to develop into productive clinical investigators, and then the K99/R00 is the Pathway to Independence Award which is a 1 or 2-year award at the postdoctoral level, and then the award recipients are expected to compete successfully or to go on successfully to the R00, and this is reviewed by each NIH Institute and Center, and then they're then expected to compete successfully for an independent R01, and this website can actually show all of the active parent and IC-specific K awards. So just a little more information on the K99 R00: Its goal is to facilitate transition from a mentored postdoctoral position to an independent research position with independent NIH research support at an earlier stage than the current norm. The K99 is one or two years. That's mentored. It must be affiliated with an institution and within 4 years or for some awards 5 years of attaining the PhD or completing clinical training. Interestingly, a very high proportion of K99 awardees in 2007, 2014, and we'll try to gather some additional data on transitions to share, transition to the R00. The R00 requires that individuals have an independent tenure track or equivalent, their own lab, limited teaching or clinical responsibilities to assist in the pathway to the next independent award, and the quality of the tenure track offer before the R00 is award is administratively reviewed by NIH staff before the R00 can be approved, so this just shows the list of the different awards. The parent K99 has three different FOAs, clinical trials required, clinical trials not allowed and BESH, as I've mentioned before, but there's no US citizenship required for the parent K99. The NIAID Physician Scientist one only requires 50 percent effort and no US citizenship requirement, and the NIDCR, which is dental and cranial research, they also have no US citizenship requirement, and I think this has something to do with the fact that we really want to try to recruit more physician scientists into the R01-funded workforce. The Brain Research Through Advancing Innovative Technologies does require citizenship and permanent residence, and it's actually supported by 10 different ICs, and the MOSAIC program similarly requires citizenship and permanent residence. Just so people know, due to the COVID, there's been a two-cycle extension of eligibility beyond the 4 years, for example, announced for the parent K99 and also for the NIDCR and the MOSAIC K99, and hopefully we will get some extensions provided for others. So this just lists the K01, K08 and K23 FOAs with different requirements. The important thing to know is that not every one of these is supported by all of the NIH institutes and centers, so it's very important if an individual is thinking about putting in one of these awards to be sure that the NIH Institute and Center is actually listed on the FOA that is relevant. So institutional mentored K awards, these are the K12 and KL2. They're institutional programs to support scholar training for careers in specified research areas of interest to one or more NIH institutes and centers. The IRACDA program, I used to actually be a PI on the IRACDA program, which is funded through NIGMS, is an Institutional Research and Academic Career Development Award or K12, and what this does is, it provides postdoctoral research at a research-intensive institution for the postdoc and then also requires at least two semesters of teaching and mentoring of undergraduates at partner institutions that are focused on students from underrepresented groups in biomedical research, and this is the current due dates for the IRACDA program. Some K12 and KL2 programs are primarily for clinicians or clinically relevant research. One of them is the BIRWCH program, and the FOA, or RFA, as it's called, can be accessed here, and then the NCATS KL2, but all of these mentored K awards prepare PhDs or clinicians for independent research careers or academic careers at multiple institution types, and that's important. They're individualized, well supervised research experience and career development guidance for scholars selected by the grantee institution, and then there's always the encouragement or expectation to subsequently apply for an individual K award or research projects grants, which could be an R03, an R21 or a foundation grant. Okay. This shows the timeline for K applications. The initial receipt dates are due February 12th, June 12th and October 12th, and I should point out, this is for the individual Ks, and then if anybody puts one in and doesn't get a scorable score, funding opportunity, then they can resubmit March, July or November. This just goes now to early research and career development. This is the R03, the R21, DP2, R01 and R35, and then it's important to note, again, that early research career development could actually also be funded by diversity supplements, assuming the NIH Institute and Center actually does this, or re-entry supplements, and the reason a loan repayment program is here is often individuals who have a K award, and they have significant loan amounts. They can actually apply for an LRP. So the R03 is a small grant program. It provides limited funding for 2 years to support a variety of project types which may be pilot or feasibility studies, collection of preliminary data, secondary analysis of existing data, small, self-contained research projects or development of a new technology. They're limited to 2 years of funding, and they're not renewable. The direct costs are generally up to $50,000 a year, and some institutes and centers actually provide an R03 for their K awardees, and, for example, NIDDK is one of these. If someone has a K award, they can apply for an R03, which will help to promote their research and advancement to the next career stage. The R21 is an exploratory development or research award. It encourages new exploratory and developmental research projects by providing support for early stages of project development. Again, there are three FOAs with clinical trial required, clinical trial not allowed and basic experimental studies in humans, and so people definitely need to check on each of these FOAs or PAs, as they're called, to know which institute and center actually funds the R21. They're limited to up to 2 years of funding. The combined budget for direct costs typically may not exceed 275,000, and it's really important to know that not all NIH Institutes and Centers participate in the parent R21. Some R21 FOAs are issued by a single IC for specific exploratory programs, and this can be an independent investigator who would apply for something that is an exploratory program, and then the R35, which is the MIRA award, there's one that is for early stage investigators. This is PAR-20-117, and this is to enable investigators to apply earlier in their independent research careers, secure funding to launch and sustain successful research careers, enhance their ability to move into research areas distinct from their postdoctoral mentors, and then also because the MIRA is quite different than an ROI, it's reducing time writing and reviewing grant applications and allow more time to conduct research, and it enables investigators to mentor trainees in a more stable research environment. Then the DP2, this is an interesting one. This is the Directors New Innovator Award. It supports early stage investigators of exceptional creativity who propose very innovative new research approaches with potentially major impact. The applicants much hold an independent research position as of September 1 of the fiscal year of the grant submission. It complements ongoing efforts by NIH to fund early stage investors through R01 equivalent grants. They're required to commit at least 25 percent of their research effort each year to activities supported by the New Innovator Award, and the awards are up to $300,000 in direct costs each year for 5 years, plus applicable indirect costs, and, again, these are very competitive. There's not a huge number that are funded, but if someone is really an incredible early-stage investigator with a lot of skills, this could be something that is worth applying for. And then if we look at our established investigators, the R01 FOA applies to all ICs. The Maximizing Investigator's Research Award, this is for established investigators. It's funded by NIGMS, NCI, NINDS, NHLBI and NCI. The R15 AREA and REAP grants are funded by NIGMS, and then people should definitely take a look at the existing program grants: P01s, the Center Core Grants, the Specialized Center Grants, and then a P20 grant is an exploratory grant to support planning for new programs, expansion or modification of existing resources and feasibility studies to explore various approaches to the development of interdisciplinary programs, and then the R15 AREA and REAP awards, they support small-scale research projects that are conducted by faculty and students at educational institutions that have less than $6 million in total NIH funding. The goal is to support meritorious research as well as provide students with research training at these institutions. The AREA grant is focused on undergraduate institutions. The REAP grant is for health professional and graduate schools. The project period is limited to 3 years, and the grants are renewable. Preliminary data is not required but may be provided as appropriate, and the direct costs are 300,000 over the entire project period. And I just want to make sure people know about the definition for early-stage investigators because it's changed a few years ago. The ESI is a program director/principal investigator who has completed their terminal research degree, which particularly the PhD, or the end of postgraduate clinical training, and this used to be the end of residency, but it was changed to postgraduate clinical training because it was understood that a number of times after residency, there are clinicians who really have to go on and do some required clinical training, and also, this addressed the issue that there were some concerns that clinicians were a much smaller proportion of the R01 equivalent funded research than our clinicians. On this ... Both of these definitions are for those who completed the research degree or the end of postgraduate clinical training in the past 10 years and who had not previously competed successfully as a program director or PI for a substantial NIH independent research award. So how do you make sure that people have appropriate ESI status? Then any program director or PI who's going to be applying for an R01 equivalent must have an eRA Commons account at the time of the application, and, also, this is true for individuals that have K awards. Prior to the application submission, program directors are encouraged to verify or enter the date of their terminal research degree or end of postgraduate clinical training, and the NIH systems will automatically calculate whether the investigator is an ESI, and the status is shown in the investigator's eRA Commons profile. Investigators should make sure that their status is correctly marked in their profile, and if the status is incorrect, please contact the eRA service desk. For extension of ESI status, some researchers have lapses in their research or research training or experience periods of less than full-time effort. An NIH considers ESI extension requests for the following: medical concerns, disability, family care responsibilities, extended periods of clinical training, natural disasters, which include COVID at the moment, and active duty military service. This is determined on a case-by-case basis at the sole discretion of NIH, and I and Shoshana Kahana are actually chairs of the ESI extension committee. Prior to extension requests, a program director's PI should verify or enter the date of their terminal research degree or end of post-graduate clinical training in eRA Commons. People need to know that a recent NOT indicates automatic 1-year ESI extension for childbirth during the initial ESI period. We've had some questions about this. This applies automatically to a female who has given birth, and then men who have been involved in looking after a newborn child and have lost any time can actually put in a request for the time that they have lost. There is a new portal in ERA that people can access to put in this extension of ESI status. This shows the ESI extension request portal. You log into eRA Commons, select the personal profile tab, click on edit option for the education section, and then that will show the ESI extension request form, and people can submit that request through this actual port. And then lastly, the NIH loan repayment program, eligible research areas stay as clinical, pediatric, health disparities ... Actually, something that's changed very recently, it used to be that only NIMHD actually funded the LRPs for health disparities. Now, all IC are allowed to actually look at health disparities. For example, if something that is there that is looking at health disparities research, health disparities for somebody in blood pressure or cardiovascular disease, that can go to NHLBI ... contraception and infertility and clinical disadvantaged. The LRP maximum increased to $50,000 a year this year. The first award has to be 2 years, and individuals have to put in at least 50 percent research each year, and then after the 2 years, people can apply for continued LRP funding for a year at a time. This shows you the link to the LRP dashboard which will give updated data on the LRPs, and this just shows you an overview of the number of applications, awards. The success rate is pretty high, so anybody who has eligible and significant loan can definitely think about applying for an LRP, and with that, I'm going to stop. I think it's important that everybody keep the joy in research, and don't be too stressed about writing a grant. Writing a grant should be fun and rewarding, and then trainees and mentees provide a scientific family forever. I'm still in touch with most of the individuals that I trained while I was at UNC, and with that, I'll stop and take questions.