K99/R00 award

Tips and Strategies for NEI applicants

Organized and Compiled by
Raji Shyam Ph.D., Indiana University Bloomington
Arathy Kartha Ph.D., Johns Hopkins University

Reviewer's perspective
Barry Giesbrecht Ph.D., University of California, Santa Barbara

Contributors (in alphabetical order)
Michael Beyeler Ph.D., University of California, Santa Barbara
Sayantan Datta Ph.D., Emory University
Arathy Kartha Ph.D., Johns Hopkins University
Fiona McDonnell Ph.D., Duke University
Jorge Otero-Millan Ph.D., University of California, Berkeley
Raji Shyam Ph.D., Indiana University Bloomington
Noelle Stiles Ph.D., University of Southern California
Deepika Vasudevan Ph.D., University of Pittsburgh
Alex White Ph.D., Barnard College
Yingzi Xiong Ph.D., University of Minnesota
Elizabeth Zuniga-Sanchez Ph.D., Baylor College of Medicine

Overview

We are a panel of K99 award recipients from the National Eye Institute. Our goal is to highlight the diverse forms of vision research funded by the NEI and provide tips and strategies for the K99 application.

What will you find here?

1. Reviewer's perspective
2. List of Frequently Asked Questions
3. Personal experiences and strategies organized by fields of study
4. Answers to other questions from the community
5. Checklist for application

Why should you apply for the K99/R00 grant?

If you are interested in a career in academia, this grant is the way to go. It provides you with funding for up to two years of mentored research (post-doc), and three years of independent research (R00 phase, in an R1 institute).

It is one of the only NIH grants that are available for non-citizens, non-permanent residents of the United States.

Websites and other useful links

Blog series by Pipette Protagonist, Ph.D.:

- https://edgeforscholars.org/not-that-kind-of-career-development-award-tales-of-writing-the-k99r00/
- https://edgeforscholars.org/not-that-kind-of-grant-tales-of-waiting-for-career-development-awards/
- https://edgeforscholars.org/not-that-kind-of-career-development-award-tales-of-living-with-the-k99r00/
- https://writedit.wordpress.com/
- https://futurepislack.wordpress.com/

Blog post by Ying-Zi Xiong, Ph.D.: https://yingzixiong.com/get-that-k99-official-story/

The NEI grant workshop at ARVO

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Barry Giesbrecht, Ph.D.	Professor, Psychological & Brain Sciences Co-Director, Institute for Collaborative Biotechnologies University of California, Santa Barbara	5-6

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Disclaimer - We are not affiliated with the National Eye Institute. This document is a compilation of our personal experiences with the K99/R00 application process, and it is not meant to be exhaustive.

Reviewer's perspective

Barry Giesbrecht, Ph.D.
Professor, Psychological & Brain Sciences
Co-Director, Institute for Collaborative Biotechnologies
University of California, Santa Barbara

1) What are a few things that make a K99 application stand out?

At the broadest level, many of the components of an application that make it stand out are related to the training plan and its integration with an excellent research plan.

The applications that tend to stick out and score well are those that
a) have clearly stated and specific career goals
b) a careful analysis of current gaps in expertise that are required to achieve the stated goals
c) a balance of structured (e.g., didactic, workshops) and less structured professional development activities, and
d) a rigorous research plan that is integrated with the career plan (e.g., the skills that are needed are acquired through the K99 phase and deployed in the R00 phase).

At a more detailed level, good applications have a carefully considered timeline, with milestones and evaluation metrics. Having an excellent research plan is important, but that alone is insufficient. That said, don't fill up your time with career development activities to the point that there aren't enough hours in the day to complete your research!

2) What should early post-docs and senior graduate students aim to accomplish before their K99 application?

This is a challenging question.
My suggestion would be to create a five-year plan of research and training objectives. Figure out what skills and mentorship are needed to achieve those objectives and then start putting the pieces of the puzzle together. Realistically, those objectives, especially the ones tackled first, should likely be focused on research and, as best as one can, establish a good record of rigorous research. By this I do not mean in terms of numbers, but really in terms of quality work. It is important to identify multiple mentors that can contribute to training at the different stages of the 5 year plan.
I'd also add that more senior post-docs who are putting together a K99 need to demonstrate why they need the additional training. This is because one of the review criteria is whether the plan will significantly increase the likelihood of successfully establishing an independent and productive research career. If a senior applicant already has a stellar record and the training plan is pedestrian (e.g., more of the same), the application will not score well. So, for senior applicants, they need to demonstrate why the additional training is essential for them to achieve their career goals.

3) What are your pet-peeves in a K99 application?

There are a number of things that sink applications.

a. Generic career goals and training plans. K99's are a wonderful opportunity and should be taken advantage of. Get creative, don't just rely on your campus' training modules, etc. Find opportunities/activities that would only be possible with the K99.

b. Lack of milestones and evaluation metrics. A common question in reviews is whether there are metrics to assess the training plan. Think about how your mentors can provide valuable feedback at critical points. Don't just rely on papers as a metric.

c. Lack of separation plan for transition to independence. Mentors must provide clear statements about how the applicant's independence will be protected as they transition to independence. This should be detailed and even include statements about intellectual property and access to data, etc.

d. Applications that don't hit the review criteria. Look closely at the stated review criteria and make sure that the application addresses every single thing.

Michael Beyeler (he/him)

@ProfBeyeler

https://bionicvisionlab.org/

Field of expertise - Prosthetic Vision, Computational Neuroscience

NEI K99 award received in 2018

1) **When did you apply?**

   I applied during my second year of postdoctoral training. At that point, I had a (smaller) publication from my postdoc lab in the press and some preliminary data in hand.

2) **When did you talk to your PI about your academic aspirations?**

   My PI made me aware of the K99 as soon as my aspirations to stay in academia became clear. As an international scholar, I had gotten used to being ineligible for most Grad-level grants. Since the K99 does not have such restrictions, I knew that this would be one of only a few possibilities to attract funding during my postdoc.

3) **How did you assemble your mentoring team?**

   Cold email: two local experts and an external one. To decide who I would ask, I first put together my Specific Aims and thought about what additional skills I would need to support the proposed research. Then I discussed with my advisor to find local experts that would fit the bill.

   Interesting side note: I also had a famous name on there from another institution, which I thought would add some (in the words of my postdoc advisor) *sparkle power* to my proposal, but the NIH review panel was not impressed and urged me to find a local expert instead who would have more time for me.

4) **How many aims did your grant have?**

   Four, but my submission was criticized for being overly ambitious. I should have stuck to my three main aims.

   The three main aims all had a K99 sub-aim and two or three sub-aims for the R00 phase. My reasoning was that the mentoring team would help me get started, but that after a year or two I would be independent enough to finish the aims on my own. This logic seemed to resonate with the review panel.

5) **Did you have preliminary data?**

   I had some preliminary data, but I'm not sure how much of a difference it made in the end. I felt that the mentoring plan and research approach were more important.

6) **How did you show independence from your PI?**

By proposing to integrate skills from my Ph.D., my postdoc advisor, and my K99 mentors. I changed fields from Ph.D. to postdoc, so it was relatively straightforward to argue that I am not my postdoc advisor's clone.

Sayantan Datta (he/him)

@saydatt

saydatt@gmail.com

https://www.sayantandattalab.com/

Field of expertise - AMD, RPE, mitochondria, oxidative stress, iPS-RPE

K99 phase in Wilmer Eye Institute Johns Hopkins University, R00 phase in Emory University Dept of Ophthalmology

NEI K99 award received in 2018

1) **When did you apply?**
   First application in June 2017 (got a non-fundable score), resubmission in Nov 2017 (which was my last eligible cycle). Resubmission in the very next cycle is not always possible, I got lucky.

   I had to change lab after one year of postdoc (it was a cancer genetics lab) so I practically had just two or so years to start a completely new project in a new field, gather data and apply.

2) **When did you talk to your PI about your academic aspirations?**
   On the very first day that I joined Dr Handa's lab at Wilmer Eye Institute, we discussed about the year to year long term goals and K99 was one of the things on the list (he also made clear which will be my first author projects and which will be co-author projects)

3) **How did you assemble your mentoring team?**
   Besides my primary mentor, I had two co-mentors - one person was the PI from our neighboring lab and very well-known in our field. I would use his instruments and expertise all the time so he was a natural choice. The other co-mentor was from the Dept of Cell Biology at Johns Hopkins who is an expert in mitochondrial biology. I found him through pure Google search - not while writing K99 though - a year before that when I was looking for a mito expert on campus.
   I added a collaborator during resubmission based on the reviewer's comments.

4) **How many aims did your grant have**?
   3 aims - 2 for K99 phase, 1 for R00

5) **Did you have preliminary data?**
   Yes - had proof of concept data for all 3 aims.

6) **How did you show independence from your PI?**
My project was an off-shoot from one of my PI's R01s but once I started working on it, it took a completely different turn and was an independent project in itself. Also, my PI is a clinician and I am a basic researcher so we have very distinct career goals. Also, my PI is respectful about my projects and he doesn't step into those territories - he is nice.

Arathy Kartha (she/her)

@arathykartha

akartha2@jhmi.edu

Field of expertise - Low Vision, Vision Rehabilitation, Prosthetic Vision

NEI K99 award received in 2021

1) **When did you apply?**

   I applied as soon as I completed 2 years of my postdoctoral training (had some preliminary data). NEI considers only those who are within 4 years of their postdoctoral training to be eligible for this grant. So, it is important to start thinking early and leave room for re-submissions if required. Fortunately, mine was funded in the first submission.

2) **When did you talk to your PI about your academic aspirations?**

   During my first year at Hopkins, I attended a symposium on career development awards and that's where I first heard about the K99 mechanism. I talked to my PI immediately after that to let him know that as an international candidate, this would be the only grant mechanism that I would be eligible for.

3) **What was your first step after deciding to apply?**

   The first step I took was to reach out to the program officer at the NEI to verify my eligibility. I had a long hiatus after my Ph.D. (almost 8 years) before I started my postdoctoral training. Even though I was in the second year of my postdoc I was not sure if I was eligible because some institutes consider 4 years from the day you graduate from your Ph.D. In my case, I was completely away from research during my hiatus so my postdoctoral research experience counted only from the time I started my current postdoc. Of course, this can only be verified by the program officer and it is important for you to know this sooner than later.

   Even if you are not worried about eligibility, it is important to reach out to the program officer to make sure that your research topic fits the mission of the NIH institute that you are planning to apply to. When you contact the PO, it is really helpful to include your specific aims page.

4) **How did you assemble your mentoring team?**

   Once I finalized my research topic, looking for mentors was not very hard. It is important to have people who have experience in the area of research that you have proposed. My PI, who is my primary mentor, helped me a lot in reaching out to the right people as well. I also wanted to look for mentors for each of my aims and they have a wide range of expertise which is really important.

   For the K99 phase, it is not only important that you have a great project to work with, but also to have a great training plan as this is primarily a training grant. So,

you need to have mentors in your team that you can learn new things from and not repeat what your primary mentor has to offer.

In any case, it is called an "application package" rather than just an "application" for a reason. It is the entire package including candidate background, project topic, a mentoring team, and the research environment that will go into your score. Unless you strengthen each of these components, you will not be able to get a favorable score.

5) **How many aims did your grant have**?

I had two main aims. My first aim has three sub-aims. Initially, I had written 4 aims for each of these. But my mentors and the staff at the postdoctoral office who reviewed my application strongly advised against having more than 3 aims as it looked like I was proposing "too much" and will come across as unrealistic.

6) **Did you have preliminary data?**

Yes, I did. This might be different for different disciplines, but having some preliminary data to report helps to strengthen the feasibility of your proposal. As the K99 phase supports only the candidate, you cannot propose something completely different from what your PI's lab is doing. So showing that you have most of the equipment required to accomplish your goals makes it look like you can complete your aims with the money you are getting. In short, there won't be much room for shopping for that fancy electron microscope or supercomputer that you have been eyeing for a long time, at least not in the K99 phase. Presenting your preliminary data shows that you know what you are proposing to do and how to do it with the resources provided by your mentors. Through your preliminary data you can also justify what your project is lacking in terms of resources that you want to achieve through your grant.

7) **How did you show independence from your PI?**

My proposal is clearly different from my PI's work, which has been largely focused on developing psychophysical tools to assess visual potential in people undergoing vision restoration. I will be studying rehabilitation using multisensory integration which is clearly different from his work.

Fiona McDonnell (she/her)

@fiona_sinead

Field of expertise - Glaucoma

NEI K99 award received in 2020

1) **When did you apply?**

In the 4th year of my postdoc. I should have applied earlier, as I had no chance to reapply if it was needed (fortunately it was not needed)

2) **When did you talk to your PI about your academic aspirations?**

From the first year I joined the lab, my PI and I talked about my goals and we kept that updated with conversations throughout my postdoc.

3) **How did you assemble your mentoring team?**

Through networking at conferences and collaborators I had worked with, I asked those who could contribute to my training while I was assembling my specific aims to write letters of support.

4) **How many aims did your grant have?**

4 aims. 2 designated to my K99 phase and 2 to the R00 phase.

5) **Did you have preliminary data?**

I had a small portion of preliminary data to support the initial aims.

6) **How did you show independence from your PI?**

I worked with my PI to discuss the research I wanted to do and the direction it was taking to ensure that I would not be overlapping my research with his.

Jorge Otero-Millan (he/him)

@j_oteromillan

https://jorgeoteromillan.com/

Field of expertise - Eye movements and visual perception

NEI K99 award received in 2018

1) **What was your timeline for application?**

I defended in April 2012 and started my postdoc in August that year. Applied for K99 the last chance I had to still be able to squeeze two submissions. First submission October 2016. Not funded. Second submission March 2017. Funded in December 2017 to start in March 2018.

2) **When did you talk to your PI about your academic aspirations?**

From the very beginning.

3) **How did you assemble your mentoring team?**

Coordinating with my primary mentor and following his suggestions. For the primary mentor, I chose a senior person even though I had been working more closely with another junior PI. Both were in my mentoring team and then we added somebody that worked in related problems and had been successful at the institute I was applying to and also somebody else that complemented the expertise of the other mentors.

4) **How many aims did your grant have?**

Three aims. One for the mentored period, two for the independent period.

5) **Did you have preliminary data?**

I have data for some experiment similar to what I was proposing in aim 1. But nothing for aims 2 and 3.

6) **How did you show independence from your PI?**

My profile is very different. I am an engineer and my PI was a clinician. So that helped. He was retiring and that also helped. But the main thing was that the theme of the grant did not come directly from my PI's work.

Raji Shyam (she/her)

@ShyamRaji

rashyam@iu.edu

https://www.rajishyam.info/

Field of expertise - Molecular mechanisms behind corneal endothelial dystrophies

NEI K99 award received in 2021

1) **What was your timeline for application?**

I defended my Ph.D. in May 2017, started my post-doc in October 2017. I applied for the K99 in October 2020. I had two middle-author papers from my post-doc lab at the time. My first author paper was complete (it was in a preprint server) but not accepted for publication at the time of application. I wanted to have enough time in my postdoc stage for resubmission if needed. Thankfully, my grant was funded in the first submission.

2) **When did you talk to your PI about your academic aspirations?**

When I first met my PI for a postdoc interview, I informed him of my aspirations to stay in academia. He was supportive and helped set up milestones to determine whether this was a reasonable option for me. The sooner you have this conversation with your PI, the better.

Since my PI was aware of my plans, he encouraged me to apply for other grants prior to my K99 application. I received a TL1 postdoctoral fellowship from Indiana CTSI (2018-2020) and Knights Templar career starter grant (2019-2021). He also made sure that I was involved in other projects in the lab besides my main projects. This helped me get additional papers which were helpful to show productivity.

3) **How did you assemble your mentoring team?**

Cold email.

My Ph.D. studies were on carotenoid metabolism in the RPE and retina. My K99 experimental plan involved cell signaling work in Fuchs corneal endothelial dystrophy. I did not have any connections who could guide me in my experiments. In addition to my PI, I decided on two people in my university and one expert from another university. Thankfully, the members I chose for my mentoring team were eager to help me.

You want people who are committed to your success. The K99 application process involved a lot of back and forth between my mentoring team, my PI, and myself while I was figuring out the experimental strategy. If your mentoring team involves not fully committed people, they won't be able to guide you (which is the whole point of having a team in place).

4) **How many aims did your grant have?**

Three aims. First two aims were for the K99 phase, and the third one for my R00 phase. I had preliminary data for all three aims.

5) **Did you have preliminary data?**

Yes. I firmly believe that having preliminary data sets you apart from the rest of the applicant pool. You will find that most people who were awarded the grant had strong preliminary data.

6) **How did you show independence from your PI?**

My PI's lab studies a rare form of corneal endothelial dystrophy called Congenital Hereditary Endothelial Dystrophy (CHED). My K99 application was on Fuchs endothelial dystrophy (FECD), a prevalent corneal endothelial dystrophy. My PI is an expert in corneal endothelial transport physiology. My grant focused on cell signaling pathways that are affected in Fuchs endothelial dystrophy. My PI did not have any grants on Fuchs dystrophy, which also helped. In the statement of support, my PI made it very clear that the K99 proposal and ideas were all mine, and not his.

Noelle Stiles (she/her)

nstiles@usc.edu

http://www.its.caltech.edu/~nstiles/index.htm

Field of expertise -Visual restoration with retinal prostheses, cross-modal plasticity, multisensory integration and illusions, and low vision

NEI K99 award received in 2020

1) **When did you apply?**

I applied to the NEI K99 in year 4, the grant was not funded. I applied to BRAIN NIH NEI K99 in my 5th year and it was funded. My sense was that it really mattered who the reviewers were, some weaknesses with one review panel were listed as strengths with another. Also, it is useful to know that your PI's R01s, etc are reviewed by research area-specific panels whereas the K awards are reviewed by a general panel, so specific descriptions you would write for a research grant may not be reviewed as well by a general K99 panel.

It is best to look up the NIH K99/R00 applications call that you will be applying to and look at the time window of applications. Usually, it is 4-5 years post-Ph.D. but there are exceptions and complicated situations you should also know about. I recommend applying either after you have your first major publication in your postdoc, or 1.5 years before the deadline (so that you have time to reapply if you don't get the award in the first round).

2) **When did you talk to my PI about your academic aspirations?**

It is important to have their support for the mentorship part of the application. They will need to work with you to draft a mentorship plan so they need to be onboard. I started talking with my PI about the K99 1 year before the application deadline. I think you should start talking about it as soon as you are seriously thinking about applying to the K99. They might have good advice, and if they are not supportive it is better to know earlier than later. Side note: I also had a generous 3-year fellowship from the Beckman Foundation for the first years of my postdoc, as well as other delaying factors (PI's leaving or passing away) so this may have delayed this initial conversion.

3) **How did you assemble your mentoring team?**

Ideally, you should already have a mentoring team. If you have collaborated on projects, the PIs on those extra projects are great additional mentors. If you have faculty you have had good

interactions with at conferences, seminars, or department events, those are good connections. For your advisory committee, I recommend asking people who you know and have had good interactions with, but not necessarily published with (they have to submit a letter of support but not a recommendation). For the recommendations, I recommend asking the faculty you have published papers with including your graduate school PI. I had several collaborators, and colleagues I interacted with already due to the multiple interdisciplinary projects I work on, and so I was able to ask all existing connections for my mentorship team.

4) **How many aims did your grant have?**

I had three aims but I have seen major proposals with 2 or 4 aims. It really depends on your project and how it divides into major questions and goals.

5) **Did you have preliminary data?**

Yes, and I highly recommend it. Most NIH proposals require pilot data to reduce the risk of the project you are proposing. That being said you don't want the entire project finished either, you need a balance of some data but not all the results to complete the project. I had pilot data for aim 1 that was processed and supported my hypothesis, pilot data in aim 2 that was started in the processing but no conclusions yet (the processing was proposed as a part of the training), and pilot data for aim 3 that was related to the goal but not identical to it.

6) **How did you show independence from your PI?**

To some extent, you will have overlap with your existing research, and therefore your PI, but you should also have an aim or two that is entirely yours (i.e. your idea and separate from your PI). For my K99 I had one project for my K99 phase that was a continuation of my current research (so I had pilot data), one aim that was focused on learning new skills (so I could focus on the K99/R00 training aspect), and one aim that was entirely my idea and would be done mostly in the R00 phase. You can do this by bringing in some of the skills from your Ph.D., which might be different from your PI. You can also just propose a new perspective or way of investigating the problem you have been working on.

Deepika Vasudevan (she/her)

@dvasudevan

https://www.deepikavasudevan.info/

https://www.flystresslab.com/

Field of expertise - Drosophila model of retinitis pigmentosa to study translation regulation

NEI K99 award received - 2018

1) **When did you apply?**

I started my postdoc in Apr 2014 and submitted my application in June 2017. My strategy was to allow myself at least one resubmission though the proposal was fortunately funded in the first round.

2) **When did you talk to your PI about your academic aspirations?**

I was upfront about my aspirations from the time that I interviewed and had made it clear that I'd need support to be writing fellowships etc. I was lucky in that my advisor was fully on board with the plan and we regularly discussed (at least once a few months) what my next steps would be.

3) **How did you assemble my mentoring team?**

It was a mixture of expertise and people that I had a good rapport with who I knew would take the time out to support me. I did let them know that I would need feedback on my job application package, job talk, and chalk talk – and made sure they were ok with the time commitment that this came with. Not all of them ended up being available fully but a big subset was there which was crucial for feedback.

4) **How many aims did your grant have?**

Two aims in the K99 section and one broad aim for the R00.

5) **Did you have preliminary data?**

I had substantial preliminary data for the K99 region with strong justification for why I required two more years of postdoctoral training. The R00 aim was more idea-driven and had no unpublished preliminary data.

6) **How did you show independence from my PI?**

My advisor's research is centered around stress signaling and my work organically moved away from signaling towards studying the regulation of mRNA translation. This worked to my advantage because it demonstrated that I was building different expertise. This was also something my advisor emphasized in his mentor letter. My advisor and I also had multiple open conversations about what I would be taking with me leading to the K99 application itself which really helped formulate the 'independence' section.

Alex L. White (he/him)

http://alexlwhite.com/

Field of expertise - Visual Attention, Word Recognition

NEI K99 award received in 2018

1) **When did you apply?**

I applied in September of 2017, 4 years after defending my Ph.D. I had first done a short 1-year postdoc abroad and was nearly 3 years into a second postdoc back in the US when I applied for the K99. I wished that I had got my act together sooner, as it was a rush to get the application submitted before I became ineligible.

2) **When did you talk to your PI about your academic aspirations?**

I never seriously considered any other career, although I would have done had I not got lucky with the K99. So, I don't remember much discussion with my PI about it, although he probably did ask early on if it was my intention to apply for faculty jobs.

3) **How did you assemble your mentoring team?**

Early in my postdoc, I got to know a new professor in another department, who did research I found new and exciting. I started attending his lab meetings and collaborating on a side project. He was the one who told me to apply to the K99, proposing him as my new mentor with my existing PI as a secondary mentor. That worked, because I could move to a new department and new skills, but keep the existing support I had.

4) **How many aims did your grant have?**

Three: Aim 1 to be completed in the K99 phase, Aim 2 to begin in the K99 phase, and Aim 3 for the R00 phase.

5) **Did you have preliminary data?**

Yes.

6) **How did you show independence from your PI?**

The research in my proposal was a special blend of the questions and methods used by my previous mentor (psychophysics & MRI of visual attention) and my new K99 mentor

(the study of reading & dyslexia). So, my research wasn't quite like anything else going on in either lab and therefore plausible that I could continue it independently after starting my own faculty position.

Yingzi Xiong (she/her)

@Yingzi_Xiong

https://yingzixiong.com/

Field of expertise - dual sensory loss, vision rehabilitation

NEI K99 award received in 2020

1) **When did you apply?**

   I started preparing for the application in the second year of my postdoc and submitted it at the beginning of my third year.

2) **When did you talk to your PI about my academic aspirations?**

   It has always been very clear to me that I want to stay in academia. I believe I have shown that to my postdoc mentor when he interviewed me for the postdoc position and throughout our collaborations.

   At the beginning of my second postdoc year, my mentor "warned" me that the grant supporting my position will conclude soon and I need to think about the next steps. We consulted the grant staff in my department and figured out a few options for international applicants, and K99 was one of them. I didn't know how competitive k99 was when I decided to apply, otherwise, I might hesitate :).

3) **How did you assemble my mentoring team?**

   My K99 proposal combines computational modeling and realist testing to address challenges faced by people with concurrent vision and hearing impairment. This topic is interdisciplinary in its nature so I needed mentors who have expertise in vision loss research, hearing loss research and computational modeling.

   My primary mentor is my postdoc mentor, who has expertise in vision loss research. Before applying for K99 I already started some hearing loss research with another faculty in my department, who naturally became my second mentor. I cold emailed the third mentor, who is a big name in the computational vision science field.

   I want to add that a strong mentor and collaborator team is really important for the application. They will make the review committee confident that the proposed project (and you) will likely succeed. If your mentor(s) have successfully mentored many students who established their own academic careers, that will be a big plus too.

4) **How many aims did your grant have?**

   I had three. This was the number that I heard from all the workshops. The first two aims were for K99 and the third was for R00.

5) **Did you have preliminary data?**

Yes. What I heard was that preliminary data is very important. I had preliminary data for my aim 1 and some of the results from aim 1 were presented at aim 3 to establish the premise.

6) **How did you show independence from your PI?**

It was clear that my proposal is independent of my PI's. My postdoc PI studies low vision and my K99 proposal is about dual sensory loss. I use computational modeling, which is different too.

Elizabeth Zuniga-Sanchez (she/her)

https://www.bcm.edu/people-search/elizabeth-zuniga-sanchez-34596

Field of expertise - Molecular mechanisms of retinal circuitry

NEI K99 award received in 2017

1) **When did you apply?**

I applied the fourth year of my postdoc but in retrospect this was too late. I should have given myself enough time to resubmit if I needed to.

2) **When did you talk to your PI about your academic aspirations?**

I talked to my PI about my academic aspirations before I even started my postdoctoral position. A lot of planning needs to happen therefore it is important to have this conversation right at the beginning.

3) **How did you assemble your mentoring team?**

I assembled my mentoring team from already existing collaborators and those that I met at conferences. These were people that did not do the same type of work but whose research will greatly further my studies.

4) **How many aims did your grant have?**

I had two aims in my research proposal.

5) **Did you have preliminary data?**

I had some preliminary data for the K99 part but none for the R00. Most of my preliminary data came from a manuscript that we were preparing for publication. At the time I applied, I did not have a publication.

6) **How did you show independence from your PI?**

From the beginning of my postdoc, I started a new project in the lab that was different from my PI but it was aligned with the lab's research goals.

Answers to additional questions

In this section, you will find additional questions that were asked as part of our webinar. All the panelists (Raji, Arathy, Michael, and Yingzi) have provided their answers to these questions.

Please note that these are our opinions. Always check with the Program official before proceeding with your application.

1) **As a postdoc, what is the best "year" (time) to apply for the K99?**

Raji: I think anytime from year 2 of your postdoc is a good time to apply. You obviously should have ideas that are independent of your PI, you should also have preliminary data to support your hypothesis, and you should have a mentoring team in place. You are ready to apply once you have these.

Arathy: If you can plan to complete and submit the application sometime in the 2nd year, it will put you in a good position to have time for resubmission if required.

Michael: Year 2 sounds right to me, too. That being said, I didn't really feel ready when I applied - but my PI told me "you'll never *really* feel ready for these things". So you'll possibly want to apply as soon as you have your first postdoc preprint out and your mentoring team in place

Yingzi: I agree that year 2 is a good time to start the preparation. I think it is wise to leave enough time for at least two submissions (one new submission and one revision). Another thing to keep in mind is that the application takes a substantial amount of time. If you are on your mentor's grant that supports you on a different project, you also need to think about how to maintain productivity on that project at the same time.

2) **What are some tips to look as productive as possible and also come across as seriously committed to an academic career in your application materials?**

Raji: Having a good number of papers is key, in my opinion. Unless you are committed to an academic career, why would you spend all the time on publications, right? At least that's my logic. Having a good mentor statement from your PI, where they articulate the reasons why you will be successful in academia is also helpful.

Arathy: As others have mentioned here, I think having one or two publications from your postdoc gives some weight to your application. But productivity can also be shown in the form of other activities such as science outreach and advocacy groups that you have been part of. I think this is an important part of academia in addition to doing good science.

Michael: I can't imagine anyone working their way through the grant application process just for kicks - so they all better be pretty committed to their academic careers at this point. :) In terms of productivity, what (I believe) reviewers are really

trying to assess is: how likely is this applicant to develop into a rockstar scientist? And there are many ways to show your potential. Productivity through published research is great of course (the best predictor of your future productivity is your past productivity), but you may also want to highlight your ability to think deeply about a scientific problem, to take an innovative approach, to come up with a unique solution to a problem, to combine methodologies from different disciplines, etc.

Yingzi: Agree with Raji's comments on how to present productivity. The "Candidate Background" document is a good place to show your commitment and enthusiasm to an academic career. I spent a lot of time on this document. I tried to make mine a little personal, telling the story about what got me into academia. A clear short-term and long-term plan is also important.

3) **Is there any citizenship requirement for this grant?**

Raji: No. In fact, the K99/R00 is one of the only NIH training grants that do not have citizenship requirements. This is also one of the reasons why it is very competitive.

Arathy: Same as what Raji and Yingzi have said.

Michael: Not citizenship, but you (obviously) need a valid visa/work authorization for the duration of the grant. We're looking at a 5-year grant, which takes at least a year to be reviewed & awarded - so OPT might not cut it. However, I don't think NIH will come knocking on your door asking for your DS-2019 - the responsibility of obtaining a valid visa lies with you, and the verification falls on your home institution.

Yingzi: Second Raji.

4) **What are the best ways to navigate the application process and submit a competitive K99?**

Raji: You want to be very organized. There are several moving pieces to this grant. There are internal deadlines to be met, and many letters to be collected before you can submit. Once you talk to your PI and get them on board the grant application process, you must email the program officer and let them know of your plan to apply. You also need to inform the grants management professional in your department about getting started on this process from their end. Universities often

have internal deadlines, which are sometimes 7-10 days before the NIH deadlines. Be aware of this.

Arathy: The first step would be to develop an exhaustive checklist. The second step is to get hold of and review as many previous proposals as you can. I got this through the Professional Development and Careers Office at my university. Thankfully, it had a mix of both awarded and non-awarded ones so I could get an idea of what the reviewers were looking for. But they were not all NEI submissions. So the next step would be to reach out to as many people as you can in your department who were successful in submitting a K99/R00 previously. I also found this workshop/workbook https://www.grantcentral.com/workbooks/national-institutes-of-health/ particularly resourceful during the writing process.

The good part about starting early is that NEI itself has a mechanism where you can send it for a pre-review if you are at least a month ahead so that you can get someone to read and comment before you submit it. If you cannot quite make this happen, I would recommend sending your proposal to some of your senior colleagues in your group or your potential referees for review and comments.

Michael: I totally agree with the other answers here. It's an involved process and it takes a lot of time. Get used to it. :) You want to be hyper-organized and uber-prepared

Yingzi: Start the application as early as possible, especially those documents that need others' effort. I made a list of all the documents required and marked them with my own deadlines.

- It's tricky to determine when to request the letters. Your mentors and collaborators need to have a good idea of your proposal before they can write the letters. So talk to them frequently to update them on your progress.
- Another thing that I had no idea about was planning the budget. In my university, the budget needs to be routed through university-sponsored project administration before submission, which takes some extra time. Be sure you work on your budget early on.

5) **I am a Ph.D. student and am looking for a lab for my postdoc after graduation. What would be the key factors to choosing the lab? Is the lab PI or a big/small lab would affect my chance of getting a K99?**

Raji: I can only speak from my personal experience. I joined a well-established lab for my post-doc. My PI is the Dean of the institute. It definitely worked in my favor. The reviewers were happy that my PI had several successful trainees and multiple NIH grants. I think the key factors in choosing a lab for me were - (1) science that was different from my Ph.D. work. I studied RPE metabolism in graduate school. I moved to corneal endothelial dystrophies for my post-doc. (2) PI who is happy to help me be successful in academia. I have witnessed several talented people give up their academic aspirations because of poor mentorship.

Arathy: I think it is better to look at the big picture here. This would be a good time to think about long-term plans. If you are interested in academia/industry/science communication/advocacy/science writer etc. I think if you choose academia then, it is important to look for the academic environment and other resources for professional development in addition to a lab that matches your interests. Lab PI is a huge factor for K99 as he/she will be your potential mentor for this application.

Michael: To offer a different perspective here... Yes, there is some evidence that the prestige of your postdoc PI will influence your career chances more than the prestige of your Ph.D. PI (sorry, I can't seem to find the reference right now). And no, you're no worse off if your PI is female - that article was retracted. But you ought to be thinking less about the K99 and more about what kind of researcher you want to become - how are you going to set yourself apart from your mentors and become an independent researcher who can provide a unique perspective? Choose a postdoc lab that believes in your vision and has the appropriate resources/willingness to mentor/push you in that direction. Someplace that lets you combine learned skills with new skills and wants to see you publish as much as you want it yourself. The K99 will follow naturally

Yingzi: Second Raji on this too.

6) **How many published first-author papers are needed to be competitive?**

Raji: I had several papers from my Ph.D. and post-doc years. I did not have a first-author paper as a post-doc when I applied for the K99. I had a complete story that was on the pre-print server. It was not published yet.

Arathy: I know that having publications is important for any application in academic training but there are no set numbers. It would be great to have at least a couple of publications from your postdoc work. But if that is delaying your application then it is better to start your application early so that by the time you get your reviews back, this is definitely something you can correct for your re-submission.

Michael: A couple? I had a handful from my PhD studies, one published from my postdoc and one on bioRxiv. It was enough to demonstrate that I was productive throughout my career. A good grant reviewer will not count beans, but instead look at the quality and consistency of your publication record to gauge the probability of your future success. (That being said, one of the reviewers said "but he only has X journal articles", haha. Still got the grant though) The actual number is probably highly field-dependent

Yingzi: I had the same question when I applied. I had first author papers from both PhD and postdoc at the time of application. I think the reviewers mostly want to see whether you can be productive continuously. My friend didn't have a first-author postdoc paper when she applied, but her mentor made a strong case of her productivity in the mentor's letter, which was a big help. But still, get those publications out!

7) **As it has been seen in the recent trends, do we need a big paper to be a competitive candidate for K99?**

Raji: I did not have a first-author paper as a post-doc at the time of application. I had a few middle-author papers from the post-doc lab. In my opinion, you want to show productivity. More importantly, you want to show good ideas and an independent path from your PI.

Arathy: This really depends on the project topic. K99 is a training grant and it is my understanding that as long as you can prove your productivity, that's what matters. If you are already a well-established researcher then you are not considered as an early-career researcher and so that may work against your K-application.

Michael: No, but it doesn't hurt. Do you need a Cell/Nature/Science paper or K99 to land a faculty position? Also no (but it doesn't hurt)

Yingzi: I had a sort of big (not huge LOL) paper from my PhD work. Other papers are not in high-impact journals but those journals are reputable in the fields. I don't think a big paper plays a heavy role here.

8) **What are some tips for increasing the reviewers' interest in my research?**

Raji: In my experience, **a novel hypothesis** is a big seller. If your hypothesis is not novel, tell them explicitly why it is worth funding. **Ideas that offer benefit to a disease, or a human condition are also appealing.** Again, don't assume that the reviewers will appreciate your work. Make it very clear so that they can appreciate it.

Arathy: I think proposing a topic that is highly relevant to your field of study is important. It is important to also go through the mission statements and priority areas for NEI so that you can make sure what you are proposing is in line with the institute's mission. For example, it is not enough to just say that the topic you are studying has never been studied before. It is important to state the need for more research or gaps that need attention to take the field forward.

Michael: What all others said, but don't forget that the K99 is not just about your research. The candidate background and mentoring aspect is at least as important. It's really about your *potential* to become an outstanding researcher. If you already know everything, you don't need more mentoring - you should apply for an R01 instead. This can put you in an awkward position as a K99 applicant...you need to somehow make the case that you're *really* good...but you know, not quite good *enough* yet to be completely independent...so you need just 1-2 more years of mentoring...but after that, oh boy - imagine the possibilities!

Yingzi: Talking to people inside and outside your field about your idea, and you will kind of know whether your proposal can get people excited. As Raji mentioned, it is really important to make it clear the novelty of your proposal and why your research matters. The "Significance" and "Innovation" sections in the research strategy are good places to demonstrate this.

K99 - Checklist

This is a checklist used for the 2021 K99 application. Please check K99/R00 guidelines to confirm the requirements before using this checklist.

https://grants.nih.gov/grants/guide/pa-files/PA-19-130.html

- ☐ **Your Biosketch (see the Biographical Sketch Format Page)**
- ☐ **Project Summary/Abstract**
- ☐ **Project Narrative**
- ☐ **Bibliography & References Cited**
- ☐ **Facilities & Other Resources**
- ☐ **Equipment**
- ☐ **Candidate Information and Goals for Career Development**
- ☐ **Specific Aims**
- ☐ **Research Strategy**
- ☐ **Training in the Responsible Conduct of Research**
- ☐ **Plans and Statements of Mentor**
- ☐ **Letters of References (typically from your Ph.D. advisor, dissertation committee members, and collaborators). These letters are submitted anonymously through the NIH submission portal.**
- ☐ **Letters of Support (from your post-doc advisory committee). These are not anonymous. They are submitted alongside your application.**
- ☐ **Description of Institutional Environment**
- ☐ **Institutional Commitment to Candidate's Research Career Development**
- ☐ **Vertebrate Animals (if applicable)**
- ☐ **Select Agent Research (if applicable)**
- ☐ **Resource Sharing**
- ☐ **Authentication of Key Biological and/or Chemical Resources**