

Suggestions for a Good Career Development Plan

The [career development plan](#) (CDP), or training plan [\[1\]](#), is intended to serve several related purposes. It should provide the skills and knowledge required to successfully conduct the currently proposed research, as well as the skills and knowledge necessary to move on to the subsequently envisioned research. In addition, at its conclusion, it should enable you to be “expert” in your research area (the breadth of this research area is defined by the applicant; the reviewers, of course, may or may not agree that it is appropriate). Ideally, the CDP will include a discussion of networking opportunities, which provide the applicant with insight and opinions from researchers outside of their immediate environment and help them to become “known” within the research community.

Consider using a gap-based approach. Many reviewers consider gap-based CDPs to be ideal. In a gap-based CDP, applicants identify what training and expertise they already have, and what training and expertise they must gain (in other words, the gaps in their training) in order to achieve their objectives (i.e. completing an outstanding research project, obtaining the skills to transition to the next phase and becoming “expert” in their field). In addition to being advantageous for the design of the training objectives, this organization helps define for reviewers why the applicant is including the proposed activities, and whether the applicant’s plan is appropriate.

Career development activities may include courses, but if no courses are needed, they shouldn’t be proposed (many applicants mistakenly believe they are “supposed” to include coursework in their plan). Activities should be proposed based on the thoughtful consideration of the weaknesses, or gaps, in the applicant’s knowledge and skills, relative to development of their research career. Clearly, all applicants should be attending journal clubs and relevant seminars, and presenting their research at national or international meetings (make sure you include plans for this). Items to consider include: proficiency in writing and/or oral presentation skills, gaining knowledge in a

subject relevant to their research, travel to meetings to meet colleagues and leaders in the field, the frequency and plan for meetings with mentors, etc. (regarding the latter, if multiple mentors are involved, the applicant should clearly describe the plan for meeting with mentors individually, the plan for meeting with multiple mentors simultaneously, how often, what for, etc. – note that all mentors should be aware of the plan and identify their agreement and mentorship role in their letters of support).

There is no “best” CDP and importantly, applicants SHOULD NOT mimic the CDP from other “successful” applications. Each individual has a different background, is pursuing a different set of research goals, and should have a CDP that is uniquely designed to fill the gaps of the individual applicant.

Benefits of a Gap-based CDP. The benefit of a gap-based plan in the review process should be clear. An applicant proposes goals, an overall project and a set of experiments designed not only to answer a scientific question, but to propel the applicant to the next career stage. By telling reviewers what their experience is, what their gaps are and how they will fill those gaps, applicants enable reviewers to easily evaluate their plans. As always, it is critical that an application makes the applicant’s plans crystal clear to reviewers. If reviewers think the applicant has a thoughtful, individualized, appropriate plan, they will give the CDP criterion a good score, which, combined with an excellent research plan, will generate [enthusiasm for the entire application](#).²¹ Conversely, when reviewers question why an activity is included in a plan, or are confused, their overall enthusiasm for the entire application may be reduced.

Include a plan for experimental design and statistics. All scientists should have exceptionally strong training in experimental design, as well as an understanding of the statistics that are appropriate for different experimental approaches. Clinician-scientists (and to be sure, many Ph.D scientists) have often not obtained rigorous formal training in experimental design and statistical methodology. Regardless of the type of research (basic, clinical, translational), all applicants should become expert in the concepts of experimental design and hypothesis testing. CDPs should make clear either 1) that the applicant has received extensive formal training in experimental design or 2) how the applicant will receive this expertise. Whereas few

scientists will develop the statistical expertise to consider themselves statisticians, all scientists should have a solid understanding of fundamental statistical concepts, and the different types of statistical tests used for different types of studies. The statistical training should be in depth for the applicant's specific research topic. In addition, however, a broader understanding of statistical methodology will not only help applicants design experiments well, but will enable applicants to analyze their results appropriately as their research evolves.

Avoid common errors in the CDP. Quite often, poor CDPs are the result of applicants inserting elements simply because they think they are required for a good CDP. Other times, activities are included because of a lack of understanding of the purpose of the CDP. Some of the more common mistakes are listed below.

1. **Including unnecessary activities.** An example might be somebody who is going to utilize imaging methodology in experiments and proposes to take a course in the physics of scanner technology. It is clearly necessary for the applicant to understand the limitations, potential for variation and flaws in imaging data so that images can be interpreted correctly – in a good CDP, an applicant will have a clear plan for becoming expert in this knowledge. For many applicants, however, it will be unnecessary to understand the physics underlying machine operation.
2. **Including irrelevant activities.** An example might be a basic scientist, who is doing *in vitro* experiments with no immediate clinical applicability, proposing to receive extensive training in the conduct of clinical trials. Of course, applicants can receive training in anything of interest, and seemingly irrelevant training may indeed prove useful in their future. But unless it is justified based on its contribution to the proposed trajectory of their research project, it will likely be viewed negatively.
3. **Taking courses that are too introductory, or too advanced.** An example of this might be an applicant with prior statistical expertise proposing to take a relatively introductory statistics course. Similarly, proposing to take advanced courses in a difficult subject for which the applicant has no preliminary credentials will be viewed in a negative

light. A good CDP will describe the specific expertise needed and then propose a specific, appropriate course or set of topics to be learned to get it.

4. **Spending too much time on activities that will detract from accomplishing the research goals.** No matter how appropriate the proposed career development activities are, if they require too much time, reviewers will question whether they may hinder the applicant's research progress. Applicants must always keep in mind that the goal is to complete an outstanding research project and transition to the next planned phase of their research career.

Get advice from people with experience. As for all parts of a grant application, K applicants should work closely with mentors who are successful at obtaining research funding, and preferably, who understand the [NIH](#) system. Although not always possible, it is ideal if one or more mentors has successfully sponsored K applications. It can also be very helpful to speak to investigators who have served on K study sections. Finally, potential applicants are encouraged to speak with relevant [NINDS](#) staff (see [Getting Answers: Who to Contact at NINDS for Different Types of Questions](#)).

Some important things to keep in mind when seeking guidance about K applications:

1. It can be very valuable to get advice from colleagues who have recently obtained K awards. However, keep in mind that this advice is anecdotal, and for many reasons, what worked for them may not work for you. As with all advice, get lots of it and make your own decisions – there are no “right” answers, and no magic bullets for success.
2. It can be very helpful to see examples of successful K award applications. However, be careful not to view those examples as a template for success. Each K applicant and project are different, and importantly, applications should be written in the applicant's voice, not somebody else's.
3. K applications are reviewed mostly in NIH institute study sections. Each institute, and each institute study section, has different priorities in review and provides reviewers with instructions that reflect those

priorities. In addition, each institute study section has its own scoring calibration. Consequently, the same application can be viewed differently depending on institute assignment. So one must be particularly careful not to be overly reliant on a “successful” K application as an example when it was assigned to a different institute than the one to which you’ll be applying.

[1] In [NIH](#) language, the career development plan refers to career development (K) awards and a “training plan” refers to [NRSA](#) training (F and T) awards. These are marginally different and, for brevity, will both be considered a CDP.

[2] Remember, there are always two components to reviewer “happiness.” The obvious component is that they will provide high marks to what they perceive as a good plan, and lower marks to what they perceive as an inadequate, or poorly conceived plan. In addition, however, if reviewers think applicants are thoughtful, thorough and well-organized, and that they know exactly where they want to go and how they’re going to get there, their appreciation of these qualities will put the entire application in a positive light.