

Optimizing the utility of the individual development plan for trainees in the biosciences

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Obtaining more data on how institutions, faculty and trainees utilize the individual development plan can only increase its usefulness for exploring both academic and non-academic careers.

There has been increasing interest within the biosciences community on career planning, particularly non-academic career planning. As the number of biosciences graduate students in the United States increases, the reality of obtaining an academic job is bleak. Data from the National Science Board show that the percentage of doctorate recipients holding tenure and tenure-track appointments in the biosciences 3 to 5 years after receiving their PhD has decreased from 17.3% in 1993 to 10.6% in 2013 (ref. 1). These percentages are worst in the biological, agricultural, and environmental life sciences relative to computer and information sciences, physical sciences, psychology, engineering, mathematics, and social sciences. The challenging landscape of the current research establishment has been reviewed and discussed by many²⁻⁶. In the setting of limited ability to attain academic jobs, as well as competing interests including mental health concerns, financial pressures, and personal stressors, the individual development plan (IDP) was created in 2002 by the US Federation of American Societies for Experimental Biology (FASEB) to address many of these issues⁷. In 2012, myIDP

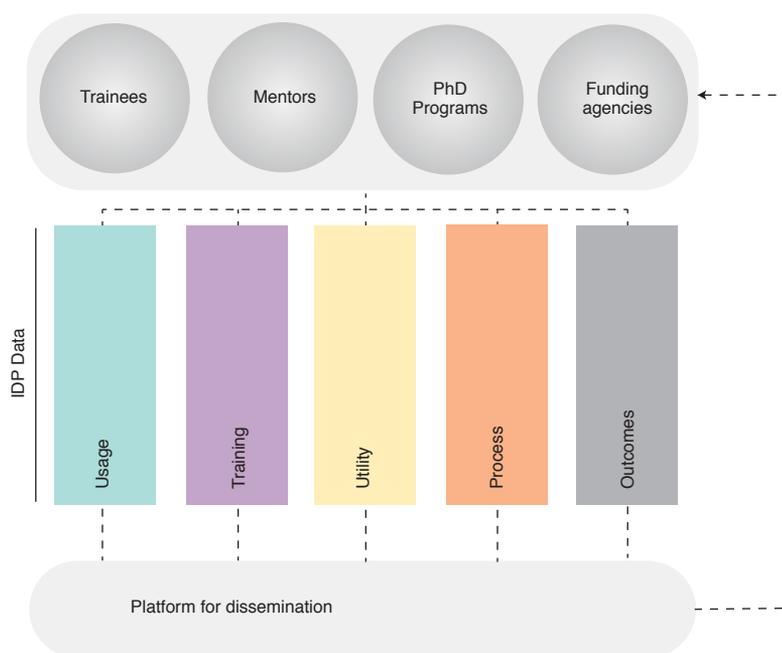


Figure 1 A feedback model for collecting data from all key stakeholders (trainees, mentors, PhD programs, and funding organizations) on the usage, training, utility, process, and outcomes for IDPs. A central online platform may facilitate the dissemination of data and analysis to stakeholders.

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(<http://myidp.sciencecareers.org/>) was introduced as a web-based career planning tool that graduate students and post-doctoral fellows could utilize⁸. And, in October 2014, the National Institutes of Health implemented a policy requiring reporting of IDP information in research progress reports for grants, further underscoring the perceived value of the IDP⁹.

The IDP is meant to provide a process by which graduate students and post-doctoral fellows can identify their career objectives, both short and long term, as well as gaps in their own professional development. The planning process is designed to be iterative in nature and highly dynamic, involving regular conversa-

tions between trainee and mentor. It provides formalized mentorship, a clear structure to explore non-academic fields, and specific guidance for career development while in training. The process itself provides a tool by which trainees and their faculty mentors can utilize a template to spur conversation. Trainees should clearly identify their goals, reflect on their long-term career objectives, evaluate their own strengths and weaknesses, and learn to modify the plan as needed. Mentors should make time to discuss opportunities with trainees and provide feedback in order to improve the IDP. Regular meetings outside of routine discussion of scientific research are necessary.

A call for more data

The benefits of the IDP, when used appropriately by both trainee and mentor, are immense. Trainees gain skills in self-assessment, resulting in self-reflection and the ability to identify areas for improvement. The IDP, moreover, lends itself to improved communication between trainee and mentor. The iterative process is certainly beneficial as it results in continued self-assessment, modification of both short- and long-term objectives with experience, and continuity through mentorship. On the other hand, the IDP could certainly be viewed by some as cumbersome. It may be time consuming for faculty members with a large number of trainees to meet on a regular basis. Trainees themselves may find the process daunting. The pros and cons of the IDP in practice, however, are less clear.

Since the introduction of the IDP, there has been limited analysis of its use and effectiveness. Several questions remain unanswered regarding IDP usage, training, utility, process, and outcomes. How many graduate students and post-doctoral fellows use the IDP as it was meant to be used, on a regular basis in an iterative fashion? Do trainees find the IDP helpful or harmful? How many institutions actually require the IDP for their trainees? Do faculty members receive formal training on the IDP process and mentoring, in general? Do faculty members feel fully engaged in the IDP process or burdened by it? Do trainees spend the time to thoughtfully self-reflect and self-assess or do they rush to scribble down a plan at the last minute prior to their meeting? Has the IDP helped trainees explore non-academic job opportunities and identify career opportunities that they otherwise would not have had?

The IDP can clearly lend significant benefit and value, as evidenced by the DePace Lab at Harvard University. Members of the

lab wrote an outstanding primer detailing the lab's approach to the IDP, showing that commitment from both trainees and mentor can result in a tremendously rewarding process that improves lab productivity and nurtures a culture of lab happiness^{10,11}. We believe that a national assessment of IDP usage, its benefits, and best practices is necessary to evaluate the current state of professional development and mentorship that trainees receive via the use of IDPs. We also urge academic institutions, the National Institutes of Health (NIH), the National Science Foundation (NSF), and other stakeholders to play a leadership role and promote the release of data that have been collected, as this could enhance the way in which IDPs are currently utilized and delivered. Moreover, there now exists a unique opportunity to build a centralized platform to allow all stakeholders to work together in sharing and analyzing data on IDPs (Fig. 1).

Expanding IDP usage

If more data are collected showing the significant benefit of the IDP in its current usage, why should the IDP be limited solely to graduate and post-doctoral trainees? Used appropriately, it could be incredibly beneficial at earlier stages of the training pipeline for undergraduate students and even younger trainees in high school and middle school. In Sweden, for example, schoolteachers are required to implement an individual development plan designed for each student¹². There have been both qualitative and quantitative studies of the IDP as it is used in Sweden that show mixed results^{13,14}. While these results certainly cannot be extrapolated to the IDP as it is used by trainees in the biosciences, this further underscores the utility of gathering more data and research on the topic. The IDP should be viewed as one tool

in a large toolbox of professional development activities. The University of Massachusetts Medical School, for example, utilizes the IDP as one component of the UMMS BEST program (<https://www.umassmed.edu/gsbbs/career/educators/umms/>)¹⁴. Ultimately, we believe that more data on IDP usage will only benefit trainees and mentors. We urge academic institutions to seriously consider providing trainees with formalized career and professional development activities to enhance their training experience and adequately prepare them for the future. While trainees must be invested in their own futures by engaging in significant self-assessment, reflection, and dynamic conversations with their mentors, so must their mentors and academic institutions assist them in this.

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COMPETING INTERESTS

The authors declare no competing interests.

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