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Summary

- Start the career planning process with self-discovery and feedback from mentors.
- Understand the setting, culture, organizational structure, and leadership of the organizations under consideration for one's career.
- Understand the expectations of potential career paths.
- For personal development beyond hard knowledge and skills, acquire excellent people skills and a strong network.
- Careers are dynamic. Maintain flexibility. Moving between environments (academia vs. industry) can be challenging, but those who successfully navigate this do so with extensive planning.

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Careers in Academia and Industry: Transitions and Challenges

Swapnil V. Shewale, MS, PhD,¹ and Flaura Winston, MD, PhD²



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- Careers are dynamic. Maintain flexibility. Moving between environments (academia vs. industry) can be challenging, but those who successfully navigate this do so with extensive planning.

Introduction

A career in the life sciences can take many forms. Having experience in various sectors (e.g., academia, industry, healthcare delivery, and government/regulatory) can provide a broader perspective on the issues underlying translational science and entrepreneurship. Working in industry or government can help inform one's research, so that one can be more productive when returning to academia, for example. However, moving between various job sectors can be challenging, especially with the need to "reinvent" oneself in a new setting with different expectations. Navigating the changes in the health and medical industry as well as changes in one's personal

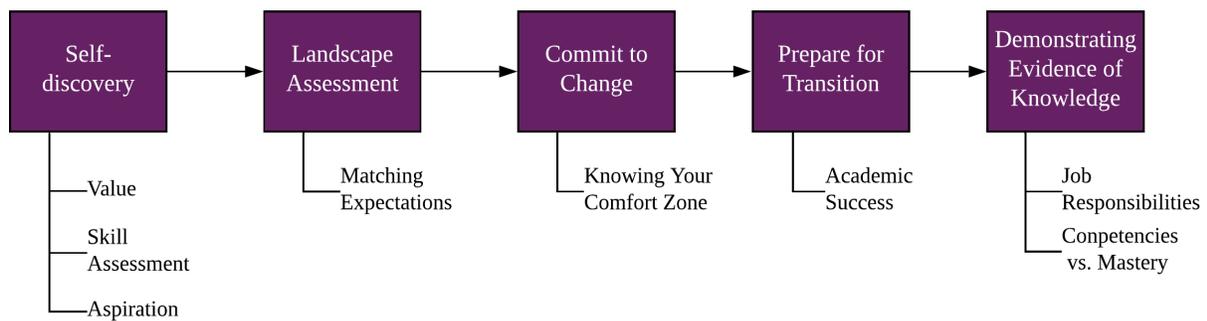
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interests requires flexibility and patience because career choices and planning are lifetime processes.

Translational research in both academia and industry requires knowledge of both bench and bedside. The actual application of a translational research paradigm varies based on the setting and focus—education, research, development, or patient care (Fluckiger). One should consider the environment that best meets their goals and start with an accurate self-assessment of personal goals to ensure synergy.

Figure 1. Career Transition.



Self-Discovery

Internal reflection and self-discovery are the starting point for ensuring an appropriate career placement. This personal journey usually begins with an honest self-assessment, specifically focused on what one finds meaningful and interesting, what one has accomplished in diverse aspects of biomedicine, and where one's contributions will be most impactful (Love). It is important to consider how a position could make one feel accomplished and fulfilled. Academic positions require obtaining grant funding, teaching, and publishing research; non-academic careers are likely broader and based on technical ability as well as soft skills (e.g., managing cross-functional teams). Several self-evaluation tools are available for potential candidates to identify their strengths and areas for improvement; one particular example is an individual development plan (IDP), further discussed in the Resources section. In addition to providing an honest self-assessment, IDPs are important for sharing and seeking feedback from mentors and peers to gain insight on leveraging strengths and improving deficits (Pickett et al.). An academic career track often involves further clarification regarding academic tracks (e.g., tenure vs. clinician-educator) and commitment to research, patient care, and teaching (see the chapter “The Promotion Process: Academic Entrepreneurship Career Tracks”). Having a defined teaching philosophy and materials for course content in one's area of expertise may be advantageous for an academic career. In contrast, industry and non-academic research positions may require strategic and leadership skill sets.

Landscape Assessment

A landscape assessment follows the self-discovery phase and involves identifying and interacting with individuals in comparable positions of interest. LinkedIn (www.linkedin.com) can be a starting point for finding like-minded colleagues and asking for their guidance. In addition, initiating collaborations while attending conferences is an effective strategy for networking and landscape assessment.

In these meetings, one should consider key topics, such as assessing whether the job description and the impact of the work matches with their personal, social, and professional expectations (see the chapter “Negotiating strategies”). The ideal job may be steps ahead of where one stands on the career ladder and may involve a commitment to professional development. It would be necessary to balance potential training commitments with social and family obligations, keeping in mind one’s desired work-life balance. It is equally important to consider how change will impact one’s life if they are considering transitioning from one sector to another. Any new position requires dedicated additional effort to learn the culture, policies and procedures but also to develop one’s support structure. Switching likely requires acquiring new skills and a change in mindset (e.g., industry: commercialization; academia: advancing knowledge). In addition, it is important to learn about and reflect on the most suitable work environment. For example, does one work best on teams or on one’s own? What level of autonomy is allowed in the prospective position and what does one desire? Obtaining constructive feedback and assessments from others will help to keep one’s expectations realistic.

Importance of Postdoctoral Fellowships

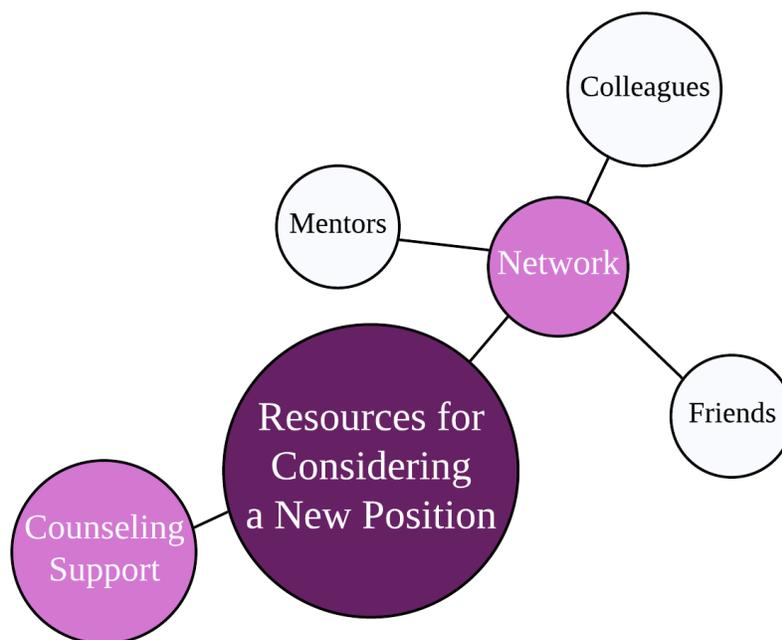
A minority of those receiving PhDs end up in tenure-track faculty positions. In 2017, 23% of PhD holders in the life and health sciences held a tenured or tenure-track position in academia, with the private sector outpacing the academic sector in the hiring of life/health science PhDs (Langin). Among those who do continue in academia, postdoctoral training is often required. During a postdoctoral fellowship, a scientist can build their curriculum vitae with publications and obtain independent grant funding, both of which are essential for securing an academic position. In the academy, success is largely driven by the “estimated scientific worth” of an individual, as defined by reputation (e.g., assessments by peers) and measurable achievements (e.g., publications, grants, and the impact of research). For industry positions, postdoctoral training is not required. In fact, for those with industry careers, additional postdoctoral training did not make up for the lost income (Kahn and Ginther). Success in industry is tied more to advancing the goals of the company than advancing one’s personal reputation.

Demonstrating Knowledge

The relevant knowledge and experience one needs to demonstrate are very dependent on the job. An industry job may require excellent project management skills and content knowledge, while an academic research position requires advancing the field in a given domain, as demonstrated by the number and impact of publications. Success metrics in industry might include validating a reliable clinical biomarker, completing a clinical trial, or receiving Food and Drug Administration (FDA) approval, while success metrics in research involve discoveries and demonstrated impact on the field. If one chooses a career in industry (either directly upon receiving a PhD or when transitioning from academia), one will need to become familiar with business processes that may not have been taught in graduate school, including academic technology transfer processes, FDA regulations, and building business cases (see the chapters “Working with the University Technology Transfer Office” and “FDA Device Regulation”).

Obtaining Expert Counsel

Career transitions can be challenging, and gaining an outside perspective can be critical to good decision-making (see Figure 2). Low-cost or free advice can come from one’s mentors, colleagues, or friends. While this can be a difficult topic to bring up, most mentors are eager to see their mentees thrive. Unfortunately, mentors in academia may lack experience with industry and might need to suggest industry colleagues for relevant advice. If one has difficulty finding industry colleagues, it might be worth obtaining fee-for-service counseling support for one-on-one sessions and for impartial 360-degree/global feedback from people in one’s network, to help one better understand their strengths and weaknesses. While these services can be expensive (up to \$15,000 or \$25,000), coaches conduct anonymous interviews with members of one’s network, and these interviews can provide insights that one may not have been able to gain by asking people directly. Such an executive coach will then work through one-on-one meetings over several months, or longer, to assist one in defining and meeting their goals. In addition, some academic centers or companies offer internal programs that may provide a pared-down approach consisting of two to four one-on-one meetings, group classes, and a computer-based 360/global survey using software like Matrix Insights (matrixinsights.com) (see the chapter “Resources at Academic Entrepreneurship Centers”). Human resources or postdoctoral affairs offices may have advice on such career-coaching services.

Figure 2. Resources for Considering a New Position.

Conclusion

One may have varied interests that span academic and commercial landscapes. It is often highly beneficial to conduct a periodic and honest assessment, coupled with networking, to carefully consider the benefits and detriments of changing or advancing in a specific career track. To achieve the desired impact and to fulfill one's potential, one may have to be introspective, be open to changing positions, and reevaluate the fit between their own career aspirations and how the organization views their value and potential.

Acknowledgments

We would like to thank Dr. Jeffrey Barrett for sharing insights that contributed to this chapter.

Resources

1. Individual development plans (IDPs)
 - a. IDPs are a new web-based career-planning tool created by the American Association for the Advancement of Science (AAAS) to help graduate students and postdocs in the sciences define and pursue their career goals. They can be found here: <http://myidp.sciencecareers.org>.
2. Career Trends: Careers Away from the Bench

- a. A publication attempting to list all available resources, with external links:
<http://www.sciencemag.org/booklets/career-trends-careers-away-bench>.
3. International Coach Federation (ICF)
 - a. The ICF is a nonprofit organization that connects and credentials professional coaches.
 - b. To find a coach, go to <https://coachfederation.org/find-a-coach>.
4. LinkedIn
 - a. LinkedIn is a private American company that provides a business- and employment-oriented networking service.
 - b. www.linkedin.com.
5. Dr. Debbie Kelly, Leaving Clinical Practice for Industry, and Spark Therapeutics
 - a. This Penn HealthX podcast describes the decision-making process behind moving from the clinical field to industry.
 - b. Podcast available here:
<https://soundcloud.com/pennhealthxpodcast/episode-4-dr-debbie-kelly-leaving-clinical-practice-for-industry-and-spark-therapeutics>.

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