In keeping with our recent Paths and Places theme, the column this month provides advice for success as a GI researcher in a setting outside of an academic medical center. Joshua Friedman, who started his career in academia, offers his perspective on the benefits and trade-offs of carrying out GI research in the pharmaceutical industry. As always, we welcome your feedback and ideas.

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GI Research Path:
From Academia to the Pharmaceutical Industry

For many gastrointestinal (GI) research scientists, the prospect of a move from academia to the pharmaceutical industry can be daunting. Their training has qualified them for a range of research-related careers, but in many cases they have been exposed only to those located in academic centers. Their mentors are predominantly academic scientists, so they lack role models on other career paths. It is also common to hear that a colleague working in industry has gone to the Dark Side, reflecting a cultural bias against industry (and a misunderstanding of the Force, but that is a subject for a different essay). In this installment of Pathways to GI Research, I hope to present a view of the pros and cons of industry positions gleaned from my own experience.

Training and Independent Research

Over the course of my medical and scientific education (MD/PhD) and clinical training (pediatric gastroenterology) at the University of Pennsylvania, my ideal career comprised conducting sponsored research as faculty in an academic setting. In retrospect, there was a trajectory to my research interests that might have predicted an eventual move to industry. My graduate research was basic in that it focused on protein–protein interactions for a class of transcription factors, it was not related to a specific disease and was conducted almost exclusively in vitro. When I returned to the bench during fellowship in pediatric gastroenterology, my research was devoted to understanding an organ (liver) rather than a class of protein, and the model system was an organism (mouse) rather than cultured cells. However, the central questions related to embryonic development rather than a disease, and the implications for human beings were by inference only. The subsequent 10 years of research continued this trend as I shifted focus to diseases of the gastrointestinal system (biliary atresia, inflammatory bowel disease, eosinophilic esophagitis) and translational studies using human specimens. It is not surprising that continuing on this trajectory would lead me to have a direct impact on patients through drug development.

Move to the Pharmaceutical Industry

It often has been observed that major life changes require both a push to change the status quo and a pull toward a new state. Despite my long-standing goal of an academic career, the tenure review process provided an impetus to consider alternatives even though it culminated in promotion. My information gaps and misconceptions regarding the pharmaceutical industry were reduced and I was willing to consider a career change. A second push was the treadmill of applications for research funding; although my laboratory was supported by National Institutes of Health and foundation grants, the uncertainty and time-consuming nature of the process impaired my quality of life as an academic scientist. This is a growing problem in academia1; in contrast, I now spend more of my time conducting research, rather than working to obtain the funding to do so. This has increased the odds of research success and my professional quality of life.

However, these push factors were only the initial triggers of my interest in industry. The decision to make the transition was driven more strongly by the attractions that I came to appreciate as I learned more. Two impressions struck me early in the process and have been reinforced through experience: the quality of the science and the impact of the work. The bar for admission into the pharmaceutical industry is high, so the resulting community is very strong and its members push each other to excel. The
individuals I work with combine deep scientific knowledge with a commitment to rigor. This commitment is more than cultural because all of our work is subject to internal and external scrutiny (eg, by health authorities such as the Food and Drug Administration) that I believe far exceeds that of the academic peer-review process. Moreover, most science within industry must go rapidly from observation into practice in the form of preclinical or clinical validation; simply put, it has to work.

The discovery, testing, and marketing of new drugs are a complex enterprise requiring many different areas of expertise, including disease biology, medicinal chemistry, clinical study design and conduct, biomarkers, statistics, medical safety, health care regulation, and more. There is a large gap between National Institutes of Health–funded discovery and the appearance of a beneficial drug on the pharmacy shelf. By bringing together all the moving parts necessary to make drug development possible, the pharmaceutical industry environment allows me to have a much greater impact than I could achieve in my academic laboratory (it also provides a range of career opportunities). For example, I was part of the phase 3 study of the anti-interleukin 12/23 antibody ustekinumab in Crohn’s disease, leading to approvals for marketing in the United States and Europe that will directly benefit many patients.

**Perspective From My Current Position**

I lead a Disease Biology team within the Immunology Therapeutic Area of Janssen Research and Development (Janssen is the pharmaceutical division of the Johnson & Johnson family of companies). The Immunology Therapeutic Area is focused on 3 main diseases: inflammatory bowel disease, rheumatoid arthritis, and psoriasis. The mission of Disease Biology is to advance our understanding of these diseases in areas that will promote drug development. In practice, this includes both internally conducted bench work and external collaborations dedicated to identifying new drug targets or supporting the development of targets already in the portfolio. My experience also illustrates the opportunity to branch out into new (for me) disease areas outside of GI. The focus is strongly translational, using human disease tissues to validate a pathway or a drug candidate, or to derive gene expression networks that can reveal new disease pathways; in this regard, access to large numbers of samples from the company’s clinical studies is a great advantage.

Despite our internal resources, key scientific expertise and biological specimens are often external to the company, so we encourage collaboration with academic leaders in their fields. The network of my team’s collaborations connects us to outstanding scientists across the globe, from the West Coast of the United States to Australia (the long way around), and I find these interactions to be a great perk of the position. Finally, as an industry partner I enjoy being the source of funding (and scientific collaborator), rather than the applicant for funding.

The transition from academia to industry also has come with a number of trade-offs. Perhaps the most common concern for scientists considering industry research is a loss of independence. It is true that my team’s focus is determined by the company’s broader strategic plan. Although persistence is valued in science, in an industry setting, terminating a project that lacks scientific priority or commercial potential is also a virtue. The discontinuation of a project to which one has devoted time and passion can be disappointing. However, initiative and innovation are highly valued, and I have found more opportunity for influencing strategic decisions than I expected. Overall, I have not found industry-related constraints to be very different from those I encountered in academia, where they were based on funding agency priorities and areas considered currently popular in the research community.

A second perceived trade-off is a decrease in research publications. Manuscripts describing discoveries made in industry positions are subject to review for intellectual property considerations, although this generally is not an impediment or results in a delay rather than a lack of publication. In addition, there is a range within the pharmaceutical industry in how much priority and time are granted to writing and publishing, so in the worst case these may become extracurricular activities. By the same token, the use of publication-related metrics in academia has been criticized for its negative effects on scientists and publication quality; this pressure is reduced in industry.

Job security is an important determinant of work satisfaction for any employee, including scientists. As in any industry, pharmaceutical corporations are subject to cycles of hiring and workforce reductions. However, a track record—and personal network—from prior industry experience is a strong advantage in seeking a new position. In practice, this means that the event of a downsizing may lead to a change in employer or area of scientific focus, rather than a loss of employment. Ultimately, individual scientists must compare that level of risk with the risk of funding loss in the academic sphere.

Finally, there are differences in culture between academia and industry, reflecting the common goals of the latter. More time must be invested in communicating to other teams and to leadership. A new set of acronyms and procedures must be learned, some of which are general to industry and some of which are company-specific. Confidentiality must always be considered in external conversations, although this easily is addressed through nondisclosure agreements. However, the corporate culture also provides an opportunity to learn a science that will be new to many biologists: organizational dynamics, the theory and practice of coordinating groups of people in pursuit of shared goals. This can be just as interesting as the coordination of molecules in a living system. Scientists in industry are part of a much larger whole, which can feel different from being an independent scientist in academia. It brings additional burdens but also the benefits of a
shared purpose and the potential for large-scale, direct impacts on patients.

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Conflicts of interest
The author discloses the following: Joshua R. Friedman is an employee of Janssen Research & Development.