Going Commercial: My Experience as a Postdoctoral Intern in Technology Transfer

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When asked about the societal impact of their research, many postdoctoral scholars often mention treating disease or advancing healthcare. However, this research would never become new therapies or life-saving devices if there wasn't a commercialization process that could take these great ideas from lab to market. At universities, for instance, researchers depend upon institutional technology transfer offices to obtain intellectual property protection and to license their technologies to interested companies. Although these offices require individuals with legal and business expertise, there is an equal need for those with technical and scientific training from various fields to use their technical expertise to assist inventors with bringing new discoveries to market. Working in technology transfer offices is a great way to gain experience in commercialization and to prepare for alternative careers in science, technology, engineering, and math (STEM).

Technology Transfer 101

Before 1980, inventors were required to transfer the ownership of intellectual property (IP) to the government if said IP was generated using federal funds. The passing of the Bayh-Dole Act in 1980 provided a major incentive for academic inventors and researchers in the United States to monetize their discoveries by allowing them to retain the rights to their IP.

According to a study (https://autm.net/AUTM/media/About-Tech-Transfer/Documents/Economic_Contribution_Report_BIO_AUTM_JUN2019_web.pdf) by the Association of University Technology Managers (AUTM) (https://autm.net/) and the Biotechnology Innovation Organization (BIO) (https://www.bio.org/), basic and translational research at universities contributes significantly to economic output in the United States. For instance, licensing patents from nonprofit institutions and universities have generated $865 billion in GDP (https://www.businesswire.com/news/home/20190605005810/en/Licensing-Academic-Patents-Contributed-1.7-Trillion-Economy) over the past 22 years. One potential factor behind the economic success of licensing university technologies is the high rate of private-sector R&D spending. A 2016 report (https://www.researchamerica.org/sites/default/files/2016US_Invest_R%26D_report.pdf) from Research! America demonstrated that 64.7% of all R&D healthcare spending originates from the private sector, while 22% originates from federal grants (Fig. 1). This increasing dependence on industry spending to advance medical research creates the need for scientists who can specialize in working with multiple stakeholders such as by building private-public partnerships (PPPs).

Figure 1: Private Sector Spending vs. Government Spending in Healthcare/Medical R&D. Source: Research! America (https://www.researchamerica.org/sites/default/files/2016US_Invest_R%26D_report.pdf).

The Postdoctoral Intern

To take advantage of local scientific talent and provide hands-on training for non-bench scientific careers, many academic institutions have developed internship programs for postdocs and graduate students. The Office of Technology Commercialization at the University of Kentucky (https://www.research.uky.edu/office-technology-commercialization/about-us), where I recently completed my internship, began its part-time OTC Fellows program (https://www.research.uky.edu/office-technology-commercialization/otc-fellows) in January 2017. One of the hallmarks of this program is that it requires all Fellows to familiarize themselves with the process of technology transfer (Fig. 2) through the analysis of new technologies.

When an individual submits a disclosure for an invention, this disclosure is assigned to each Fellow to perform a preliminary market assessment. This assessment includes a thorough examination of the patent landscape to ensure that no prior art exists, a comparison with the leading alternative technologies to identify technical and financial advantages of the disclosed technology, and the identification of potential partners based on key market players, ownership of relevant patents, and the size and growth of potential markets. Once the Fellow completes his or her assessment, they hold a meeting with the inventors to discuss the findings and ensure that all technical details are correct. After the meeting, the Fellow submits the revised invention to the Intellectual Property Committee (IPC), which consists of University faculty members with prior experience as inventors or entrepreneurs. Finally, the IPC determines whether the University should pursue patent protection for the disclosed innovation based upon the Fellow's recommendation.

Fellows at the OTC are also responsible for assisting licensing managers with the later stage of the process, which includes marketing and licensing University technologies (Fig. 2). The Fellow will draft a one-page market abstract which is similar to a scientific abstract but written in less technical language, which highlights the invention's purpose, its key advantages, and its stage of development. Ideal licensees are identified by Fellows based on the key market players, inventor relationships, or companies with a particular interest in that type of technology. Fellows will also use tools such as LinkedIn to identify and contact marketing personnel at these companies.

Figure 2: The steps of the technology transfer process that the OTC Fellows assist with during their internship. Source: U.S. Department of Health and Human Services. (https://www.hhs.gov/cto/projects/illuminating-the-tech-transfer-path/index.html)

Although balancing lab duties with my internship at the OTC could be difficult, this experience not only opened my eyes to the groundbreaking research performed at the university level but also enhanced several important transferable skills. Programs such as the OTC Fellowship challenge postdocs and grad students in scientific fields to consider the market value as well as the societal impacts of basic research. Since Fellows were often assigned to disclosures outside of their area of expertise, this experience allowed me and the other interns to quickly learn about the latest advances in other fields, so that we could accurately assess the novelty and feasibility of the disclosure. Finally, the identification of potential partners for University inventors also provided a useful exercise in networking; reaching out to industry contacts allowed me to overcome the shyness I had previously felt while using LinkedIn to build important academic-industry alliances. Building relationships with the entrepreneurial community was also valuable to my role as a leader in the postdoctoral association at UK. This year, I oversaw an acclaimed panel discussion led by graduate and postdoctoral scientists who had formed startup companies to showcase the role that trainee scientists play in scientific entrepreneurship.

Career Opportunities in Technology Transfer

As a policy-oriented scientist who is preparing to begin my AAAS Science and Technology Policy Fellowship (https://www.aaas.org/programs/science-technology-policy-fellowships) in the National Institute on Aging (https://www.nia.nih.gov/) Office of Small Business Research, I believe that my experience at OTC will be crucial to my upcoming placement. The need for this kind of experience was recently echoed by Ryan Staudt, a doctoral candidate at the University of Pittsburgh and current intern at the SciVelo Center (https://scivelo.pitt.edu/) saying, “scientific translation is often not a skill that is emphasized in graduate school, [but] it is essential to post-doctoral careers in science policy, medical writing, and medical affairs.” The growing demand for scientific experts in tech transfer has also led to the development of specialized postdoctoral fellowships at institutes such as the Innovation Fellowship at Moffitt Cancer Center (https://innovation.moffitt.org/innovation-fellowship/) and positions in the NCI (https://techtransfer.cancer.gov/aboutttc/jointtc) and NIAID (https://www.niaid.nih.gov/research/technology-transfer-fellowship-program) offices of technology transfer.

Whether one is preparing for a career in tech transfer or entrepreneurship or not, I would highly recommend getting involved in technology transfer as a way to gain transferable skills, build relationships with the university research community, and see firsthand how ideas are brought from the bench to the market.

Image: National Postdoctoral Association (https://www.nationalpostdoc.org/resource/resmgr/postdocket/july19/tt_intern.jpg)

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