Credit: Kevin Cafferty

Mission possible: redefining a successful biomedical research career

As scientists, we develop technical expertise and design experiments to support (or refute) our hypotheses. With experience, we appreciate that science can be conducted in a variety of ways — each with different key questions. All are critical for advancing biomedical research.

My career path started as it does for everyone — in academia (Johns Hopkins, MD Anderson Cancer Center). I conducted experiments in immunology using animals or specimens from clinical trials and envisioned a career as head of a laboratory in an academic research center. I would continue in immunology, conducting laboratory and clinical research in government (National Institutes of Health, Food & Drug Administration) and industry (Biogen). During this time, I gained regulatory drug review experience and served on internal committees to consider how future directions of research would drive innovation. As a result, my perception of a successful scientific career changed drastically. I was inspired to consider something I had not imagined: a research career in a non-academic setting. I participated in different activities (teaching, scientific society committee and board service, program management, portfolio strategy), which further influenced my thinking around how science is advanced. While the biomedical research community tends to emphasize academic faculty positions as a hallmark of success, we should broaden our view to define success as any role that contributes to the furtherance of science — regardless of sector, whether at or away from the bench or clinic.

Let us consider how different sectors work together and contribute to biomedical research. Academia fosters the exploration of new pathways, which could be through elucidating fundamental biology or translating scientific discoveries for application in the clinic. Scientists in government conduct research important for public health. Specific areas of focus depend on the mission and strategic priorities of the agency. The National Institutes of Health (NIH) focus broadly on biomedical research and improving health. NIH scientists often collaborate with scientists in academia to conduct studies on biological processes. The Food & Drug Administration (FDA) regulates approval of novel therapies, confirming they are safe and efficacious. Scientists at the FDA work closely with industry to ensure clinical trials properly assess the safety of drug candidates and to evaluate the potential of drug candidates to ameliorate disease in the intended population. In industry, the objective is developing therapies that address a specific unmet medical need for patients. These should be better than the standard of care or follow a different mechanism of action from existing therapies, which could result in clincally meaningful treatments across a heterogeneity of disease. Industry scientists collaborate with academia to identify new targets for drug candidates and to conduct clinical trials. My current role focuses on the use of technologies as a mechanism for identifying more sensitive clinical measures, reducing clinical trial burden and ensuring that trials better represent those with a particular disease — a completely different career path from what I had originally planned.

Experiences in industry have also been pivotal in modifying my perspective on how science can be applied away from the bench or clinic. Program management involved working with scientists across the organization (for example, biologists, clinicians, chemists and protein engineers) to identify key questions for each project and what experiments are critical. Decision making in this matrixed environment is different from academia and is particularly time sensitive, as it can influence the priority of activities. There is little appetite for therapies of similar mechanism of action that are second or third to market. Portfolio strategy considers all projects within a disease area to determine whether additional are needed — either more along a specific pathway (as many drug candidates fail due to safety concerns) or new ones that address a different mechanism of action. These are compared with portfolios at other organizations. Again, time is a factor. I was also afforded an opportunity to serve on the Transformation Team, a small group tasked with developing entirely new directions for the company. This led to an interest in clinical research and digital health.

In addition, other activities emphasized how science progresses beyond the laboratory or clinic. Service on committees and boards of scientific organizations, including the American Association for Immunologists, the Endocrine Society, Keystone Symposia, and the Society for Leukocyte Biology, provided a view on influencing the direction of biomedical research. Participation on the Massachusetts Economic Development Planning Council (https://www.mass.gov/news/baker-polito-administration-releases-partnerships-for-growth-economic-development-plan) highlighted the importance of scientists contributing to policy and decision making in unique forums. My career has been further enhanced by leadership programs such as the Keystone Symposia Fellows Program (https://www.keystonesymposia.org/KS/Online/Diversity/Fellows_Program.aspx) and The Partnership BioDiversity Fellows program (https://www.thepartnershipinc.org/services/leadership-development/).

These multi-faceted experiences provided tools to transition from technical expertise to strategic positioning and fostering a more enriched environment. All phases of my career path reiterated that we must move away from a narrow view of how scientific innovation occurs if we are to truly propel biomedical research forward. ❐

Cherié L. Butts
Digital & Quantitative Medicine, Biogen, Cambridge, MA, USA.
e-mail: cherie.butts@biogen.com

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