

8th Annual
NIH Career Symposium
Session Synopsis

2015



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8th Annual Career Symposium 2015

There are diverse opportunities for doctoral-level scientists, in every sector of the workforce, from academia, to industry, to the government, and beyond. The options can sometimes be overwhelming. What is the right career path for you, given your training, talent, and skills? To help trainees make important decisions about their careers, the NIH OITE hosted its 8th Annual Career Symposium on May 15, 2015. Over 70 speakers came to share their experiences and guide future job seekers toward their ideal career trajectory. In this newsletter, we have collected articles covering each of the 18 career panels at this year's symposium, written by an excellent group of trainees who attended them. We hope these synopses help you learn more about what it takes to get a job in the career of your choice.

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ACADEMIA PANELS

Academic Careers in Unexpected Places

Four investigators from non-traditional environments showed how strong scientific missions direct dedicated scientists to create exciting science. Audray K. Harris, PhD, Investigator, NIAID/NIH, Claudia M. Palena, PhD, Investigator, NCI/NIH, Luke D. Lavis, PhD, Group Leader, Janelia Research Campus, HHMI, Suman R. Das, PhD, Associate Professor, Infectious Disease Group, J. Craig Venter Institute all gave their time to speak to us about their researches at unexpected places.

“I think science is really weird, I mean it’s awesome- people give me money to do what I want.”

The NIH campus most closely resembles the university setting in which we expect scientific ground to be broken. A strong training environment encourages mentoring and teaching to an extent that surprises most newcomers and the tenure positions are analyzed and organized much as a university would. Audray and Claudia both spoke of their mentees with respect and enthusiasm. The research-only organizations, Janelia Research Campus, HHMI and J. Craig Venter Institute, push the envelope on science, without a requirement for student education. Janelia is proud to support science that the NIH would hesitate to fund. The first thing you see on their webpage is “What happens when bold, risky science is encouraged?” However, Luke cautioned, not all crazy ideas are good ideas and having reduced oversight can allow an investigator to fall down an unproductive rabbit hole. J. Craig Venter Institute requires 80% of funding come from contracts and grants and has the pressure that most university professors experience. They have a history of doing science at the highest level, and as part of a technology driven organization they come together as a team to approach scientific challenges.

“A (science) position is like a marriage”

How would we get this sort of job? The answers were not terribly surprising, but hammered home the need to have excellent skills, be in the right spot at the right time, and to sell yourself on your strengths. Each panelist emphasized a different pillar, but all were necessary to succeed. Finding these opportunities requires an open mind and a solid network. While each organization does post positions in the *Science* and *Nature* jobs section, every investigator on the panel found their position through their scientific network. Use your resources and networks to find these jobs.

“When a door slams in your face, find another door, to be slammed in your face”

This quote is perhaps not the most encouraging way to end a session, but it was refreshingly honest. The attitudes of the panelists toward the job search reflected the dismal climate. Stubbornness was evident in each speaker’s climb to their present position. Audray had to completely reformat his proposal to find success after two failed attempts at the Stadtman tenure-track position. During the last few years of her postdoc Claudia had to develop a brand new and risky line of investigation and convince her PI over and over again to have faith in her. Luke realized after interviewing for and being offered his position that the “postdoc” position he was preparing for was actually a PI position. His immediate response was to not jump immediately to being a boss, but he decided to believe in himself and the person the hiring committee saw. Suman acknowledged that he applied to many varied locations, but he would not compromise on what kind of position he wanted, instead patiently waited for the right one.

It's a tough environment out there, but there are many exciting and amazing opportunities in the most of unexpected places.

Emily Foran, PhD, is a Postdoctoral Fellow in Dr. Fischbeck's laboratory in the Neurogenetics Branch of NINDS. She received her PhD in Neuroscience at Thomas Jefferson University in Philadelphia PA where she studied the non-cell autonomous aspects of amyotrophic lateral sclerosis. Her present work centers on discovering possible therapies for spinal muscular atrophy and examine the impact of survival motor neuron deficient astrocytes on motor neuron health and growth.

Finding an Academic Position

As an assistant professor at University of Maryland for 13 years, Dr. Erin Strovel's advice on finding an academic position is to "attend meetings, know the directors in your institution, and NETWORK!" Dr. Gul Dolen has been an Assistant Professor at Johns Hopkins University for one and a half years. During the third year of a postdoctoral fellowship, she saw a job that was "my CV". She used her personal network to access the chair of the search committee, applied and was selected; she had the rare experience of getting the job based on one interview.

Dr. Kevin Jones, an Assistant Professor at Howard University, always aspired to academia. He experimented in diverse settings, but enjoyed teaching so much that he got a tenure-track teaching fellowship at a medical school. Wanting teaching *and* research, he quit the tenure-track teaching position to do a research fellowship. Before his mentor's departure, he applied to a new job opening that was "my CV" and, like Dr. Strovel, also got the job after one interview. His advice: "Never underestimate the power of serendipity in your career."

Dr. Samuel Bunting is an Assistant Professor at Rutgers University. His approach to getting this position was "brute force," applying to 50 jobs, getting 10 interviews and 5 offers. He identified three elements he perfected in order to get results from his academic hunt: 1) a strategy -- he used a spreadsheet to rank institutions of interest; 2) letters -- he cultivated relationships with high-ranking people outside his department; 3) the talk -- in addition to a strong CV he designed his scientific talk in order to build a convincing case for his hiring.

In preparing to apply for a faculty position, panelists published papers, interacted with program directors through their PIs, formed long-term relationships with mentors, and had friends and professionals review their CV. Science can be very nepotistic, one panelist admitted, and advised personal networking. She also recommended doing similar research at all levels of one's career, so that one could bring up even *past* impressive achievements and they would still be relevant. One panelist needed teaching experience, so he took a night job teaching at a community college, although his PI was not thrilled. He didn't limit himself to being a "glorified tech," he wrote grants, led projects, etc. The panelists advised us to "apply to many more [jobs] than you need," take advantage of the NIH OITE, and seek out information on the extramural world by talking to our PIs.

One panelist began sending out serious faculty applications about two years into her postdoc. She had made connections, so people were contacting her when positions opened up. She had limited teaching experience but her new department offered professional development courses for junior faculty. Another panelist had no papers after three years, but the job opening she saw fit well with her CV. She applied just for experience, intending to apply in earnest the next year after publishing. "If the perfect job is there," she said, "there is no downside to applying." Her paper wasn't ready, but she submitted it anyway, because "'Submitted' gives more leverage." ("Accepted' is even better," another panelist later cautioned). When someone with five *Science* papers had a disastrous interview and was not offered the job, she was. She advised enlisting colleagues, friends, and PIs for practice interviews and using the search committee chair as an advocate. The panelists advised presenting at meetings and, if not yet published, using reference letters by way of explanation.

When asked how to branch out from your PI, panelists suggested meetings and talks to access collaborators and new ideas. One found a niche and had to convince her skeptical PI. As postdocs, she stressed, we should establish and show independence from our PIs. "Stake out your own territory. Get the resources and tools now that you need to be able to do your fantasy

research later.” Another panelist drafted a grant proposal aims page to get his PI on-board for a new project.

Have confidence. Don't be afraid to apply for that position that you think you could never get. Use meetings, job boards, and find something you're passionate and excited about because “this doesn't pay enough for you to not do what you love.” As an independent researcher you get to do your dream research without asking for permission. Apply to many positions because you can never guess where a job will come from. Email people in your target departments and ask if there are jobs opening up. By being proactive, you just might find yourself a forerunner for that next academic position.

Simone Smith, PhD, is an NICHD Senior Research Fellow in the Bone and Extracellular Matrix Branch headed by Dr. Joan Marini. She received her PhD in Medical Sciences at the University of South Florida College of Medicine under the guidance of John Hassell, PhD, where she studied the role of the proteoglycan Perlecan in binding and regulating developmental proteins to control growth plate structure and function during long bone growth. Her current research focuses on 1) characterizing the pathological mechanism of the protein CRTAP, which is defective in Osteogenesis Imperfecta (or 'Brittle Bone Disease') type VII, and 2) elucidating the diverse protein networks formed in bone.

How to start up an academic research group

“Every day of your life counts, even if you take the elevators”- this was the advice of Sylvia Moreno, a Professor of University of Georgia, Athens. A casual conversation in the elevator with her neighbor brought her to the School of Exact and Natural Sciences, University of Buenos Aires, Brazil, where she got her undergraduate degree.

Once you make up your mind and before you start hunting for faculty positions, take workshops in leadership and negotiation. Faculty positions come with responsibilities and require negotiation skills. Michael J. Gambello, Section Chief of the Division of Medical Genetics at Emory University School of Medicine, said of negotiating the job offer, “you should push the envelope until they say no.” Sometimes offer letters can go back and forth for a long time and that’s perfectly ok.

Another crucial thing in the beginning is building good relationships with other faculty members who started couple years before you. “Go to lunch with them, find out what they do, treat them as friends” added Gambello.

There will be a lot of paperwork in the beginning and being a faculty member “is not only bench work”, said Nady Golestaneh, an Assistant Professor at Georgetown University Medical Center. Alike Maunakea, an Assistant Professor at University of Hawaii at Manoa, shared a similar view and mentioned that “you’ll end up doing less and less benchwork, and lots of writing.” Starting up a lab in a university setting can be very challenging if you are not familiar with the policies. So, it would be wise to learn the rules upfront.

In the beginning, hiring the right people is a key to a successful, well-organized lab. Moreno’s advice is to hire a technician first. A good technician will be able to take a lot of load from the new principal investigator’s (PI) shoulders. Hiring a postdoctoral fellow to start with might be helpful as they will require less supervision, compared to a graduate student. But, according to Gambello, extremely ambitious postdocs might not be too enthusiastic to join a small, new lab in a university.

The new PI should also learn how to handle a budget: how to distribute money and how to stay within the limits. Also, having some flexibility in the distribution is definitely helpful.

As you’ll be busy setting up your lab and have very little time doing hands-on research, a good collaboration with another faculty member can definitely help. Talking to other faculty members about science and having a connection will build your network for future collaborations. However, there are caveats that need to be understood. Maintaining honesty while navigating the politics of collaboration will keep you out of trouble down the line. For example, sort out authorship at the very beginning. Also, according to Maunakea, learning “how to say no early and often enough” is a key skill. But, Gambello thinks that saying “no” too often in the beginning might not be a good idea as “you want to be a good citizen” and build a good professional relationship with your peers. So, staying focused is a good way to balance. Also, be frank and ask for money to finance the research you’ve been asked to do as part of the collaboration. The other important elements you can keep in mind are to read “At the Helm: A Laboratory Navigator (Handbooks) by Kathy Barker, learn how to advocate for yourself, negotiate your space and personnel with the department, bring something unique, like a core facility, that will be of interest to other PIs, and be politically savvy.

Above all, find a good mentor and be excited about your work.

Soma Chowdhury is an Editorial Intern with the NIH Catalyst. She is a biologist by experience and science writer by training. After spending several years doing bench research in infectious diseases and immunology, she finally decided to quit and start writing and communicating science in a meaningful way. She is also a passionate food history blogger where she writes the stories associated with the food.

Teaching-Intensive Careers in Academia

Many trainee scientists, often based on their experiences with their mentor, assume that a faculty position in academia is composed of primarily research with a smattering of teaching. However, while many professors primarily focus on research, there are many whose primary duty is to teach. These teaching-focused positions were the topic of this panel.

Many of these teaching-focused positions exist at primarily undergraduate institutions, with most being at liberal arts, community, and two-year colleges. These teaching-focused positions can be further divided by the amount of research the faculty member is expected to do, ranging from no expected research to half-time. Out of the four panelists, two had no research expectations, while the other two had a split between teaching and research.

One of the draws of a teaching-focused position is the presumed relaxed atmosphere with fewer deadlines, no stresses due to grants, and more lenient hours; such as summers off. However, this is dependent on type of position. One panelist, Dr. Aubrey Smith, an assistant professor at Montgomery College, who holds a teaching- only position, stated that the relaxed work-life balance is one major benefit of his position. He said that he has the ability to take summers off and has the option to do research without it being a requirement. While the two panelists with a split research and teaching position, Dr. Nina Peel, an assistant professor at The College of New Jersey, and Dr. Jeremy Alden, a professor at Muhlenberg College, both said the opposite. One of the major drawbacks of their position is that as Dr. Alden put it, “the university expects you to do 80% teaching and 80% research”.

Nevertheless, all four panelists were quite satisfied with their careers and offered multiple pieces of advice to trainees interested in a teaching-focused position. All four panelists agreed that having teaching experience is important. Dr. Smith stated that many community colleges employ adjuncts to teach many of their introductory courses and that these part-time positions are an excellent way to get paid teaching experience. Dr. Peel, who did her postdoctoral training at the NIH, said that the NIH course “Scientists Teaching Scientists” is an excellent way to receive the necessary skills to become an effective teacher.

All four agreed that the teaching philosophy statement was a critical component of the application process. Dr. Alden said “A good teaching philosophy statement that demonstrates a passion for teaching can make up for a lack of teaching experience.” One question that was raised in the session was the importance of doing postdoctoral training first before pursuing a teaching career. All four panelists agreed that having postdoctoral training is a requirement.

Overall the panelists agreed that for trainees who have a passion for mentoring and teaching students, a teaching-intensive career can be immensely rewarding and satisfying.

Jacob Richards, PhD, is a postdoctoral fellow at the NCI in the laboratory of Tumor Immunology and Biology. He obtained his PhD in Medical Sciences at the University of Florida. His research focuses on discovering genetic biomarkers for treatment efficacy in cancer immunotherapy.

INDUSTRY PANELS

Careers in Industry R&D

Many scientists choose research careers in industry. In this panel, four scientists from different pharmaceutical and biotech companies were invited to share their experiences and describe their day-to-day tasks. The speakers, Benjamin Boyerinas, PhD, Scientist II from BlueBird Bio, Lesley Matthews Griner, PhD, Investigator in Oncology from Novartis, Gene-Errol Ringpis, PhD, R&D Scientist from Calimmune Inc, and Rachel Schowalter, PhD, Scientist I from Illumina all entered industry from the postdoctoral level.

So what are the main differences between working in academia versus industry?

First of all, working in a company, one must transition into a mindset focused on product development. However, emotional attachment to a specific project should be avoided because the project could be terminated next week due to priority, resource, or strategy changes within the company. In other words, one has to be flexible and accept the need to alter or end a project abruptly. Also, in order to turn a project into product, one will have to work with people from many different disciplines, such as engineers, software designers, and marketing personnel. All of the panelists emphasized the fast pace of industrial projects, which have to constantly drive toward product development. Thus the cooperation of people from many different departments is a common and important component in developing a project into a final product.

What qualities are needed to work in industry?

Besides the scientific skills, interpersonal communication skills are extremely important. Constant updates on one's project are necessary and expected. Colleagues need to know what your data means so they can design new experiments and change their plans accordingly. It is critical to let everyone know what is happening and be able to present your findings clearly and efficiently. In other words, one needs to be a 'people person' capable of interfacing with different groups from scientific, business, or regulatory backgrounds. Companies often focus on hiring people that can fit well in the team and have good chemistry. In fact, one of the panelists said an important part in his interview process was going out to lunch with the scientists on the team. How they feel about any given candidate can go long way during the hiring process. Additionally, flexibility and accessibility are similarly necessary. One should be able to adapt to the dynamics of the company and changing schedules, such as being willing to conduct conference calls late at night with collaborators living across the globe.

Tips for job applicants

When a company has open positions, the first thing they usually do is ask people they know for recommendations. This means networking is the best shortcut to a job. However, it is not the only path. One of the panelists got the advertised job directly from the interview without any recommendation; even so HR told her they went through around 200 applications in total before selecting hers. If a company is looking for specific skills and you have them, then state clearly and succinctly in the cover letter that you possess those specific skills, but do keep it short, since HR typically has many applications to sift through. Finally, as long as the technical skills match the advertised position well, a freshly graduated PhD can also have shot at being hired

as a Scientist I without doing a postdoctoral fellowship.

Pengfei Tian, PhD, is a Postdoctoral Fellow in the Laboratory of Chemical Physics within NIDDK. He received his PhD in Physics at the University of Copenhagen (Denmark) where he focused on the Monte Carlo algorithm design for protein folding and structures prediction. His present research focuses on mathematical modeling of molecular dynamics simulations.

Careers in Clinical Research and Medical Affairs

Do you have sharp presentation skills and are you an effective communicator? Do you love to teach and stay up-to-date with the latest science and technology? If you answered yes to any of these questions, then a career in clinical research and medical affairs may be for you.

The lively session began with four exuberant panelists: Drs. Adalynn Harris, David Mire, Dale Schwab, and Konstantina M. Vanevski. Each shared their own unique story and training background that highlighted the strong role bench science played in their current clinical careers.

Dr. Harris was trained as a bench scientist and realized early on that, although she loved science, she did not enjoy the actual bench work. From there, she acquired a position at Merck as a Medical Science Liaison (MSL). MSLs have advanced scientific training in the life sciences and these skills make them an invaluable asset to the success of the company. They help to ensure the products are used appropriately, serve as scientific peers and resources within the medical community, and are scientific experts to colleagues. Other than a PhD and maybe some postdoctoral training, no other additional training is required to obtain a MSL position. However, it helps to emphasize that you have acquired “soft” skills via speaking engagements, mentoring, or teaching. Similar to Dr. Harris, Dr. Mire also began as a traditional bench scientist who loved the science but felt he was a “round peg in a square hole” and that his away-from-the-bench desires were left unfulfilled. With this in mind, he also decided to become a MSL because he was able to blend his love of science with technology and business.

Drs. Schwab and Vanevski were a little different in that Dr. Schwab was a bench scientist who decided to go into a clinical postdoctoral fellowship to make her transition into a career in clinical research and medical affairs. Dr. Schwab participated in a Committee of Postgraduate Educational Program (CPEP) accredited by the American College of Microbiology whereby, after completion of the two-year postdoctoral training program in medical and public health laboratory microbiology, she could take the American Board of Medical Microbiology examination. With her clinical training background she has been able to work in the infectious disease diagnostic area creating and improving diagnostic tests. Additionally, with that training, she is now in a more senior position where she consults with healthcare providers, gives educational talks, and aids product development of diagnostic tests.

Dr. Konstantina M. Vanevski received her MD in Macedonia then came to the NIH for postdoctoral training in the area of “bench-to-bedside” science and medicine. She trained as an endocrinologist and has used her combined medical and science knowledge to work at the Food and Drug Administration and pharmaceutical companies all the while contributing to medical education as a medical editor. Her diverse interests, talents, and training have benefited her greatly as a physician scientist: she is an excellent communicator with the ability to facilitate and support dynamic science and medical teams.

The panelists stressed that receiving additional training to sharpen communication skills is of the utmost importance. Moreover, they thought that doing a postdoc is worthwhile regardless of your long-term career interests. Ultimately, the panelists agreed that a career in clinical research and medical affairs requires a team-oriented individual with a solid science background and excellent communication skills. This is a career option for anyone trained as a bench scientist, so if you are unfulfilled solely doing bench work, consider a dynamic career in clinical research and medical affairs.

Cheryl Jacobs Smith, PhD, is a Postdoctoral Fellow in the Prostate and Breast Cancer Section of the Laboratory of Human Carcinogenesis at the NCI working under Stefan Ambs, PhD. Her research focuses on identifying risk factors and mechanisms of causality in prostate and breast cancer. She received her BS in Biology from Hope College and her PhD in Human Genetics, in the laboratory of JoAnn M. Sekiguchi, PhD, at the University of Michigan.

How to Successfully Transition to Industry

Marketing is a strategic method used by all industries to ensure recognition and respect for their company. This same technique can be used for those seeking a career in the competitive and seemingly elusive biomedical industry. While many assume that industry is looking for specific research backgrounds, the invited panelists, Dr. Johanna Abend, an Investigator at Novartis, Dr. Robert Arch, a Director at Takeda Pharmaceuticals, and Dr. Nicola Pannacciulli, a Clinical Research Medical Director at Amgen said this is not necessarily the case. Throughout the session, the panelists stressed three aspects to effective self-marketing in industry: expressing your skills in a larger perspective, excellent communication capabilities, and networking.

Most industry positions have a large number of listed skills in a job posting and it is highly unlikely you will meet all of them. Because those requirements constantly change, the panelists stressed that you should not attempt to tailor your current research projects or CV to include them. Rather, you should highlight the expertise and skills you do have. In this same point, do not list everything you have ever done or published. Instead, your resume should be short, focused, and balance what you think is important while keeping in line with what HR will recognize and understand. Use active verbs to describe your capabilities and keep scientific jargon to a minimum. Furthermore, do not sell yourself in a narrow manner; rather emphasize your skills in an applicable to multiple disciplines.

It is important to note that the idea of industry focusing solely on specific research skills is misguided. The panelists said that emphasizing your communication skills is crucial to obtaining a position. The environment in industry is diverse and high-paced. You need to be flexible in delivering information to a broad audience and focused to quickly explain the bottom line of the goals and findings. The panelists suggested gaining experience in explaining your work concisely to people who have no understanding of what you do. This ability is particularly important because if you are granted an interview, your presentation will not be a critical analysis of your scientific abilities, but an assessment of your ability to field questions and express yourself to a broader audience.

Lastly, with a dense pool of applicants, networking may be what sets you apart from everyone else. Find recruiters and headhunters. In many cases, it is these individuals that can inform the company about your skills or as one panelist put it, “saves your CV from the black hole that is HR.” Dr. Abend suggested that networking should be used as an exercise in learning how to make yourself approachable and presentable. Since teamwork is central to industry culture, companies are unlikely to hire a person who cannot demonstrate cooperative capabilities.

In all, take any chance or opportunity you are presented, even if they are not exactly what you are looking for, when you are looking for them, or where. One panelist was not job searching, but was contacted by a headhunter, another never intended on staying in the US but is now based here, and the third took less appealing positions that eventually led to an ideal one he greatly enjoys. What they all had in common is that they marketed themselves as potential assets to the company's success, and those companies responded by granting them employment.

Heba Diab, PhD, is currently a Postdoctoral Fellow in the Cell Biology and Physiology Center at NHLBI. She is currently studying autophagy and lysosomal biogenesis in the Laboratory of Rosa Puertollano.

Industry Careers in Business Development and Marketing

Listening. Teaching. Being willing to admit when you do not know the answer to a question. These may not be skills that one initially associates with a career in scientific product sales or marketing. However, participants in the Industry Careers in Business Development and Marketing panel emphasized that these traits are just as important in the business world as skills such as salesmanship and the ability to present oneself well to potential customers.

The panelists described taking slightly different paths from the bench to their current positions in the business side of industry, but all emphasized a crucial step in their career transition: networking! The most important thing that someone interested in a sales or business development career can do is to form relationships with those in the field. Dr. Megha Rajaram, a Technical Sales Representative for Life Sciences/Thermo-Fisher Scientific got to know the vendors that came to her postdoc lab at the NIH, thus ensuring that she would be a natural choice for them to recommend when a sales position opened up in the company. Dr. Richard Kim transitioned from a 20-year bench career to his current role as Sales Manager with TTP Labtech Inc. when a casual vendor lunch turned into a networking opportunity and the vendor mentioned sales opportunities in his company. Dr. Leyna Zhao was plucked from the basic science arm of her company, ACEA Biosciences, Inc. when the organization underwent structural changes, and was given a trial period to learn marketing and sales skills before being promoted to her current position as Global Marketing Manager. And Dr. Kimberly Shafer-Weaver simultaneously built her reputation as a leader in the immunology field as well as her professional network during a career that straddled industry and government research before being scooped up by her current employer, Health Analytics, LLC where she works as Program Director for Immunology, Oncology, and Metabolic Disease. These examples illustrate the immense power of professional networks: none of the panelists currently hold positions that were formally advertised.

With such an emphasis on networking, session attendees asked what specific steps postdocs could take to make themselves strong applicants for these types of positions. Dr. Rajaram was succinct with her advice: if you're considering a sales career you must first be able to sell and promote yourself. She advised attendees to recognize experiences that can translate to the sales arena if described as evidence of collaboration or teamwork and backed up with clear outcomes. This strategy shows that you have a quality, such as effective communication skills, that can be substantiated by metrics of success, such as the number of presentations you've given. Drs. Shafer-Weaver and Zhao also recommended that attendees serve in leadership positions whenever possible to help hone communication skills and build relationships outside of the lab, and pursue professional development opportunities that enhance skills such as project management.

A PhD provides valuable currency when navigating the sales domain of science industry, as it helps establish your legitimacy as a technical expert with strong analytical capabilities. However, for those that wish to move up through the ranks within a business, or to be more directly involved in business development, an MBA may be a necessary next step and is a great option if your company is willing to pay for it, as was Dr. Kim's experience.

For scientists who wish to move away from the bench, careers in the business side of industrial science provide a rewarding and well-compensated avenue to apply their scientific knowledge and technical training to new challenges that are focused on customer satisfaction and on building lasting business relationships.

Sylvina Raver, PhD, is a postdoctoral fellow in the Neural Circuits and Cognition Unit within the Laboratory of Behavioral Neuroscience at the National Institute on Aging. She received her PhD in Neuroscience from the University of Maryland School of Medicine.

Bench Careers in Unexpected Places

Scientists who wish to stay at the bench often consider two career paths: academia or industry. However, participants in the Bench Careers in Unexpected Places panel presented viewpoints from non-academic or industrial labs, including those in non-profit institutes and in government research centers. All of the panelists praised their positions for allowing them more research freedom than they would expect to find in either academia or industry, and for affording them the flexibility to adopt multiple administrative roles within their organizations.

Dr. Yanbao Yu is a Staff Scientist at the J. Craig Venter Institute (JCVI), a non-profit genomics research institute that receives funding from private sources. He credits his research-intensive position at JCVI with affording him a comfortable work-life balance. Dr. Aurelio Bonavia works for the nonprofit biotech company Aeras, which is also financially supported by non-traditional sources, such as private foundations. Dr. Bonavia is Director of Translation Development for Aeras where he bridges pre-clinical animal studies with human clinical trials to advance the development of a tuberculosis vaccine. Dr. Patricia Dranchak, a Research Scientist at the National Center for Advancing Translational Sciences (NCATS), also works in translational science, albeit within a government agency. Dr. Dranchak divides her time between managing a research team and performing administrative duties that include forming collaborations within the NIH and with pharmaceutical companies to identify diseases that might become targets of NCATS' efforts. Dr. Betsy Jean Yakes, a Research Chemist for the Food and Drug Administration (FDA), leads a team of researchers and collaborates with the FDA's regulatory and science policy teams. She praises her research projects for being open-ended and exploratory in nature, and contrasts this structure with that of academia in which a specific project is funded by a grant for a delineated period of time. Dr. Cameron Good is a Bioengineering Scientist with Altus Engineering at the US Army Research Laboratory, and also credits his organization for allowing him the freedom and flexibility to pursue multiple research projects that ultimately conform to the organization's mission.

The panelists utilize their specific scientific and technical expertise by managing research projects, analyzing data, and communicating research findings through technical reports. However, panelists emphasize that success in their jobs increasingly depends on "soft skills," such as the ability to clearly communicate complex scientific concepts to diverse audiences through written reports and oral presentations, to cultivate professional networks, and to manage research teams that pursue the goals of their organizations. In fact, Dr. Dranchak noted that she had been hired almost entirely based on these "soft skills", as she lacked the technical expertise that her current position required, but instead contributed established networks within and beyond the NIH, as well as prior management experience.

When asked how they had pursued these "unexpected" bench careers, the near-unanimous response from all panelists was "networking." Dr. Dranchak encouraged people looking for these types of jobs to adopt the practice of giving a brief description of their background and career objectives to absolutely everyone and to take advantage of small moments at social events to network. Dr. Good emphasized the importance of being a good writer for those who find face-to-face interactions difficult, and to always end virtual introductions by asking whether the new contact can direct you to someone else who might provide insight. When reaching out to someone in the career that you are interested in, it's crucial to remember not to be shy, as that person undoubtedly had help navigating his or her career transition and is probably happy to repay the favor.

Sylvina Raver, PhD, is a postdoctoral fellow in the Neural Circuits and Cognition Unit within the Laboratory of Behavioral Neuroscience at the National Institute on Aging. She received her PhD in Neuroscience from the University of Maryland School of Medicine.

Industry Operations, Quality Control, and Regulatory Affairs Jobs

Iron rusts from disuse; water loses its purity from stagnation ... even so does inaction sap the vigor of the mind."

-- Leonardo da Vinci,

What does the observation by the famed sixteenth century polymath Leonardo da Vinci, have in common with advice from twenty-first century panelists at the NIH career symposium? Read on, to find out and benefit from the panelists' words of wisdom, about how bench scientists can thrive in industry operations, quality control, and regulatory affairs.

The panel consisted of Dr. Amy Wang, a Toxicologist at Syngenta Crop Protection, Dr. Alison Hogg, Senior Manager at Emergent BioSolutions, Dr. Olga Pavlova, a Regulatory and Scientific Analyst at Amarex Clinical Research, and Mr. Tim Moeller, Scientific Advisor at Bioreclamation/VT. The panelists, drawn from diverse backgrounds to their current positions, underscored certain key traits to success.

The session commenced with each panelist describing their career trajectories, making for an interesting and inspiring story for attendees. The key questions asked and addressed were what are the skills required to succeed in an industry and regulatory affairs job, typical workday, how to gain regulatory affairs experience, and relevance of doctoral background and postdoctoral training to an industry and regulatory affairs position

Dr. Amy Wang moved from Taiwan, as a young veterinarian, to the United States, to pursue a PhD in toxicology. Despite daunting personal difficulties, her quick learning abilities opened up a postdoctoral opportunity studying nanomaterials at the EPA, and subsequent employment at Syngenta. She credits her success to her initiative, diligent work ethic, and willingness to learn. Asked to describe her typical workday, she characterizes it as a non-bench job with exciting everyday challenges managing several small research studies, meetings, and reading up research literature.

Dr. Alison Hogg completed her PhD in immunology, focusing on vaccine development, in the UK and two postdoctoral stints in the US, one of them at NCI. After a few industry openings, she obtained her current position as Senior Manager overseeing biodefense-related projects at Emergent. Her workday calendar is a fast-paced challenge with meetings, travel for conferences, training, and clinical research site visits. Dr. Hogg cites LinkedIn for effective networking, taking FDA regulatory affairs courses, and highlighting crucial project management skills that are inherent in postdoctoral training, but often overlooked by trainees.

Dr. Olga Pavlova's sojourn started with her PhD in Russia, followed by a few years of postdoctoral training, including at the NIH. Since she had no industry contacts, she extensively used informational interviews, a strategy that paid off handsomely, to find a regulatory affairs position at Amarex. In her everyday job as a Quality Control and Quality Assurance Specialist, she travels to clinical research sites, reviews documents, and manages projects. She exhorts trainees to persevere while applying to regulatory affairs jobs, since recruits are mostly trained on the job and internship experience with consulting companies can often be discounted. She agreed with the other panelists that postdoctoral training, while not a prerequisite, inculcates valuable project management skills.

Mr. Timothy Moeller completed his Masters at Johns Hopkins University, working on hematology-related projects, and worked in several pharmaceutical industries before becoming Scientific Advisor at BioreclamationIVT. In his official capacity, he offers creative solutions for research problems. His typical day comprises 40% desk job component with 60% bench research and meetings, with occasional travel. He advises trainees to be intellectually curious, network aggressively, and constantly learn new skills and to reinvent oneself effectively.

Thus, the industry operations, quality control, and regulatory affairs panelists' overarching advice is very reminiscent of da Vinci's sapient observation that being dynamic is vital to mental agility and success.

Sucharitha Iyer is a postdoctoral fellow at the Metabolic Diseases Branch of the National Institute of Diabetes and Digestive and Kidney Disease (NIDDK). She obtained her PhD in Cancer Biology and Genetics at Thomas Jefferson University. Her current research focuses on elucidating the epigenetic mechanisms underlying pancreatic neuroendocrine tumors.

NON-BENCH PANELS

Careers in Science Policy

Although this panel was dedicated to careers in science policy, pine needles, trees, and forests were popular metaphors to describe the transition from bench to policy. Many panelists felt that their bench career was like collecting individual pine needles to build a tree, and their tree was only one from a whole forest. For these professionals, the forest was far more interesting than the needles. This motivated them to pursue a career in science policy.

Scientists in policy careers tend to serve as a liaison between researchers and legislative bodies such as Congress. This job goes two ways: to improve scientists' understanding of how funding rules and changes will impact their research, and also helps representatives understand what discoveries their funding dollars are supporting. Seth Jonas, PhD, Senior Research Staff at the Science and Technology Policy Institute at the Institute for Defense Analysis, describes a policy career as one of three options: 1) advocate who dedicates their time to pushing certain agendas forward, 2) analyst who develops objective, quantitative metrics to improve research results, and 3) policymaker who get bills written and signed into law. Other careers represented at the panel focus on building relationships between United States and foreign research programs or enhancing partnerships between government and industry for drug development.

Most questions asked of the panelists revolved around getting a foot in the door of policy careers and there was plenty of advice to go around. Some panelists transitioned from their postdoctoral assignments via science and technology fellowships through the American Association for the Advancement of Science or the National Academies, but others encouraged trainees to pursue detail opportunities. Details are temporary part- or full-time positions that allow fellows to work in an office to gain experience. Extracurricular activities that benefitted the panelists during their job search included: writing outside of scientific journals, volunteering with advocacy groups, and becoming active in scientific societies. As with most career advice offered by other panels, networking was a key component of career development, but this panel also emphasized finding and following your passion. According to this group of panelists, demonstrating commitment to their passions was an integral part of landing their dream job or fellowship position.

"I wish we had more PhDs on Capitol Hill," said Diane DiEuliis, PhD, Deputy Director of the Office of Policy and Planning with the Assistant Secretary for Preparedness and Response with Health and Human Services. She emphasized that the best training scientists have is their PhD. The ability to think critically and objectively allows for "big picture policy work that really makes a difference."

During graduate school students must focus on the pine needles of their projects, but as careers progress some scientists feel a calling to curate the forest. A career in science policy is an excellent way to safeguard scientific research for future generations of researchers.

Emily Petrus, PhD, is a postdoctoral fellow at NINDS in the Laboratory of Functional and Molecular Imaging. She received her PhD in Neuroscience from Johns Hopkins University while studying the mechanisms of synaptic plasticity underlying enhanced hearing in blind individuals. Her current research focuses on the adaptive capabilities of the adult brain after peripheral sensory loss.

Leveraging Your Science Through Business: Consulting Careers

This session explored the transition from bench science to a career in consulting, including management consulting and more specialized strategy consulting. Consulting is an alternative nonbench career path for PhD students, postdoctoral fellows, and other advanced-degree holders that utilizes problem solving skills, logical thinking, and teamwork ability. Panelists in this session included Jason Chong, an Associate from Booz Allen Hamilton, Puneet Khan, Senior Analyst from Obsidian Analysis Inc.; and Youhong Wang, Managing Consultant from The Center for Advancing Innovations.

Similarities and Differences Between Bench Science and Consulting

Bench science and consulting both focus on problem solving. Bench scientists solve problems by conducting research and collecting and analyzing data, while consultants help solve a client's problem using similar approaches. Both disciplines are hypothesis- and data-driven and require working in teams. However clear differences between bench science and consulting were also discussed. One difference is that research science projects usually last longer than consulting projects, which typically span only 3 to 12 months. Also, bench scientists normally focus on their own fields of expertise, while consultants work with clients in different industries, resulting in constant exposure to new knowledge with an accompanying steeper learning curve.

What to Expect as Consultants

When asked what they like most about their positions, panelists responded that they felt valued by their employers and challenged by a work environment that provides endless learning opportunities. They also appreciated the strong sense of teamwork, including technical and other support systems. Consulting provided them the opportunity to work with clients in different industries, helping grow a valuable network for future career development. With regard to work-life balance, some panelists had jobs requiring long hours (sometimes as many as 80 hours/week) and periods of intensive travel.

Advice on How to Successfully Land a Consulting Job

Panelists gave great suggestions on how to find and secure a consulting job based on their own experience. They recommended using LinkedIn and other means of networking to connect with people, attending information sessions and other recruitment events in order to get familiar with companies of interest, looking for volunteer and internship opportunities as a way to get a foot in the door, developing analytical and data-processing skills and highlighting these skills on your resume, and preparing in advance for interviews, which normally include an analytical writing test, behavioral interviews, and case studies.

Sisi Liu, is a graduate student in Dr. Constantine A. Stratakis' lab in NICHD, in the joint PhD program with The Chinese University of Hong Kong. Her thesis research is focused on the effect of Protein Kinase A on bone marrow stromal cells, bone development, and lesion formation. She is interested in a career in management consulting and healthcare strategy consulting.

Careers in Science Administration

Are you more interested in knowing the general research trends than focusing on one research project? Do you want to contribute to science in a broad landscape? Would you enjoy deciding whether a drug or grant should be approved? If your answer is yes, put the pipette down for a minute and consider a career in science administration.

This year we had an excellent group of four panelists representing different areas of science administration careers inside and outside of the NIH. Dr. Cheryl Anne Boyce is the Chief of the Behavioral and Brain Developmental branch at NIDA. On a small scale she helps researchers with grant applications, and on a larger scale she identifies research gaps to create new funding opportunities. Dr. Patricia Forcinito is a research scientist at the Office of Portfolio Analysis (OPA) where she devotes half of her time to teaching people how to use portfolio analysis software and spends the other half analyzing NIH research portfolios and helping program officers with similar analyses.

Portfolio analysis may be a new term for some but it's something that the NIH senior leadership heavily relies on in order to make well-informed decisions about what research needs more attention and funding, how productive a specific research area has been, or which programs should be shut down. Before the age of big data and the sophisticated technology we have now, program officers and institute directors had to manually go through hundreds of grants. "Now it is so easy to scan these grants and get information quickly. I get help from the OPA a lot," Dr. Boyce said.

The other two panelists came from outside the NIH. Dr. Brett Ryan Jones works at the Center for Drug Evaluation and Research (CDER), the part of the FDA responsible for reviewing drug applications, animal studies, and clinical programs. He decides whether a drug under review is indeed safe and effective. Dr. Andrew Smith is a scientific grants manager for the Susan G. Komen foundation, a non-profit organization supporting breast cancer research. His responsibilities include reviewing grant or fellowship applications, managing existing grants to make sure the projects are moving along and funds are being used appropriately, and writing articles to highlight the fellows' accomplishments.

The panelists offered a few tips to make the transition from the bench to an office a bit smoother. "I had a clear, concise plan about what direction I wanted to take in my career," said Dr. Jones who transitioned from industry to government. Networking was crucial for him, and helped him land his two previous positions. Dr. Smith emphasized the importance of informational interviews and the need to learn what employers look for in terms of skills and fit.

"With more experience you'll know what you like and where you fit," said Dr. Boyce. But administrative experience per se is not a necessity. As a postdoc at the NIH, Dr. Smith gained editing skills by joining the Fellows Editorial Board. On his resume, he was "able to spin that as peer review experience." He stressed that excellent verbal communication and writing skills go a long way.

Taking on extracurricular activities outside of lab will show that you are serious and passionate about this career path. For Dr. Forcinito, doing a detail while a postdoc at the NIH helped her gain relevant experience and consequently, her current position. "The will to learn is important," she said. At entry level, one may not have a lot of relevant experience but employers want to work with someone who is excited about taking on the next challenge.

Sophia Jeon, PhD is a Visiting Fellow in the Laboratory of Immunology at NEI. Her graduate work at the University of Pittsburgh and her current research both involve studying prevention or treatment strategies for diseases of the eye. She plans to one day write a science book that enlightens minds and warms hearts.

Careers in Science Communications

Extra! Extra! Science Writing is a Growing Field!

Stop what you are doing, put down the pipette, and move away from the bench. If you want to be a science writer, the pipette is not equal to the pen. A wide variety of science writing options exist, however few of them formally require a postdoc. If you want to go into science writing, all four speakers at the Panel on Careers in Science Communications emphasized: start writing! Despite their different backgrounds and career paths, surprising similarities surfaced among the panelists.

Darshini Trivedi, a medical writer at MedImmune, started writing informally for her graduate school newsletter, then tried her hand at technical writing during a regulatory affairs internship. Technical writing is very, well, technical. It involves writing to a template. There is no room for creativity or interpretation and the deadlines can be tight. Darshini found it rewarding to be a part of the translation of drug to market and is now leveraging her skills as a technical writer to move laterally within MedImmune into study design.

Using writing as a starting point was also a theme common to Amy Rawls, Human Resource Director at American Journal Experts, a division of Research Square. American Journal Experts is a company that edits scientific articles written by non-native English speakers for submission to English language journals. They employ many freelance editors, which can be a great way to get professional writing experience. Two career paths predominate for editors at American Journal Experts: lead technical editor or management. Amy headed down the latter path to a career in HR. Science writing can open up doors to interesting managerial careers as well as writing within other disciplines.

On the other side of the journal article submission process, journal editors represent yet another career opportunity in the field of science writing. Barbara Cheifet went straight from graduate school to journal editing without doing a postdoc (I told you to put down that pipette!). Her qualifications for the position as an Assistant Editor of Genome Biology didn't require papers published in high impact factor journals, but did require writing experience and familiarity with the journal submission and publication process. Like Darshini, she also started her writing career as a reporter for her graduate school newspaper.

Alongside technical documents and journal articles, there are also careers for science writers whose expertise extends into the broad arena of science communication media. Anne Rowzee works at the FDA's Center for Drug Evaluation and Research (CDER) as Lead Writer Editor at the Office of Communications. Her job is to communicate the significance of the science done at the FDA to the public. This position was created for and tailored to Anne due in part to her stellar networking skills.

The panelists all expressed their passion for science writing and identified this passion as a significant factor both for promotion potential in their current positions and during the application process. Gaining writing experience by doing piecework editing, a formal internship, or volunteering to write for a newsletter or blog is a great way to demonstrate your passion.

Unlike most tenure-track positions, science writing is a growing field! Not only that, once hired you will typically find plenty of room for advancement. With new journals starting all the time, significant lateral and vertical movement is possible. Such exciting news almost makes me want

to go out and get some writing experience myself. Say, for example, by reviewing a speaker panel for the Career Symposium!

April Killikelly is a Postdoctoral Fellow at NIAID's Vaccine Research Center and came to the NIH by way of a PhD from NYU. She is originally from Victoria, BC on the west (best) coast of Canada.

Careers in Science Education and Outreach

“The only one responsible for you is you,” stated Dr. Beth Ruedi. You need to ensure that you get what you want from your graduate school experience to your postdoc experience and beyond. This panel consisted of five educators highlighting the breadth of career options in education and outreach. Each panelist had a passion for education evidenced through volunteer experience. Yet the path that each educator took to get to his or her current position was unique, revealing a super-highway of possibilities.

Dr. John Balbach, PhD, teaches physics at Georgetown Preparatory School. Prior to his current position, Dr. Balbach had his own research group at George Washington University, where he developed the curriculum for a new biophysics major. As a volunteer, he developed and toured a physics magic show. While at GW, Dr. Balbach continued to improve his teaching and realized he had a passion for engaging young minds; simultaneously realizing he did not share the same excitement for research. He found his current position on the Georgetown Preparatory website, and noted that the DC area has many preparatory schools which may be looking for science teachers.

Dr. Carla Easter, PhD, is the Chief of the Education and Community Involvement Branch at the National Human Genome Research Institute. After completing her postdoctoral research at Washington University, Dr. Easter continued at the institution as a research associate in the Department of Education. Later, Dr. Easter was selected to be the inaugural Director of Outreach at Wash U. In her current position at NHGRI, Dr. Easter interacts with a variety of stakeholders while continuing to actively mentor and engage in outreach, which brings an element of excitement to her job everyday.

Dr. Monica Feliu-Mojer, PhD, is a Science Outreach Program Manager, sharing her time between Cienca Puerto Rico and iBiology. A native of Puerto Rico, initially she envisioned herself training in the United States then returning to her homeland. While in graduate school, she began volunteering for Cienca Puerto Rico, which she continued to do after earning her PhD. Dr. Feliu-Mojer described herself as an “educator and advocator of science,” continuing to use her science background to empower people and the community by creating new programs and initiatives.

As an AmeriCorps volunteer, Dr. Natalie Leach Stringer, PhD, directed a high school tutoring program. Dr. Leach Stringer is now an Assistant Professor and teacher at Montgomery College in Germantown. Although initially unsure what to expect from community college teaching, Dr. Leach Stringer learned to embrace opportunities outside her area of expertise. She stressed the importance of multitasking, time-management, and communication in her job.

Dr. Beth Ruedi, PhD, is the Director of Education and Professional Development at the Genetics Society of America (GSA). As a graduate student, she developed a diverse teaching portfolio. When she didn’t teach in her first year as a postdoc, she realized she missed it. Following a conversation with her advisor she became a lecturer, teaching one class per semester. Being an active member of the GSA herself, her mentor then recommended Dr. Ruedi for a part-time position with the GSA, allowing her to gain additional outreach experience while finishing her postdoc. In her current position, Dr. Ruedi co-ordinates educational programming at the GSA’s national meeting and manages the GSA’s awards program.

All of the panelists did postdoctoral fellowships, with some having a teaching priority as part of their fellowship. The consensus was a postdoctoral fellowship made them more competitive candidates because many employers look for that additional experience. Graduate students who are interested in a teaching career should consider postdoctoral teaching fellowships, such as the IRACDA fellowship. If you are a current postdoc interested in teaching, seek out adjunct professor positions or volunteer to gain valuable classroom time and experience. The American Association for the Advancement of Science (AAAS) has a **volunteer** program where they place STEM professionals in classrooms within the DC metro area. Exploring these kinds of opportunities will not only help you gain valuable experience, but also help determine if a career in education and outreach is the right path for you.

Amy Kullas, PhD, is a postdoctoral fellow in the laboratory of Peter R. Williamson, MD PhD, at NIAID in Bethesda. She received her doctorate in Molecular Genetics and Microbiology from Stony Brook University in New York. She is currently studying immunological mechanisms influencing the pathogenesis of fungal infections in both human patients and animal models. Amy is also involved with the career development committee and co-chair of the Global Health Interest group at the NIH.

Technology Transfer and Patent Careers

Want a career in science, at the cutting edge of research and commercialization, but don't want to work at the bench? Then a career in Technology Transfer (TT) or Patent practices might be right up your alley! Panelists from this session discussed their experiences transitioning from the bench to a profession that integrates the fields of science, business, and law.

This session's diverse group of panelists included Maria Luisa Balasta, PhD, Director/Patent Attorney at L'Oreal USA Products Inc.; Aurora M. Fontainhas, PhD, Patent Examiner at the United States Patent and Trademark Office (USPTO); and Jeffrey A. James, PhD, Licensing Manager at University of Virginia (UVa) Licensing & Ventures Group. The panel responded to the audience's most pressing questions:

What is the day-to-day like?

Effectively communicating, database searching, and computer work. As a Licensing Manager in a TT Office, Dr. James is at the forefront of research commercialization. He visits laboratories to chat with scientists about their research trying to find commercial applications, determines the novelty (Has anyone patented this before?) or non-obviousness (Is this obvious to an expert in the field?) of technologies, markets the technology, discovers potential licensing partners, and drafts/negotiates licenses. Once a patent is filed at the USPTO, Dr. Fontainhas examines the patent for novelty, non-obviousness, correct scope of protection, and communicates back-and-forth with the applicant. As a patent attorney, Dr. Balasta also plays a role in the patent process: she determines the initial scope of the invention, drafts the patent claims to cover the technology, and communicates with the USPTO and inventors.

How do I transition into these fields and what skills do I need?

The best way to transition into these fields is to determine whether you have soft skills (communication, negotiation, management, presentation) and like using them, or gain background experience outside of the lab to better develop those and others. Dr. James offered that business or TT experience is highly valued; try volunteering. He also suggested taking a business or marketing course, learning the lingo of the field, and looking into NIH TT fellowships. The panel moderator suggested the TT certificate program offered through NIH's Foundation for Advanced Education in the Sciences (FAES). All panelists agreed that while a postdoc is not necessary for these positions, they do make applicants more competitive by developing critical thinking skills. Furthermore, to gain legal experience, Dr. Balasta suggested becoming a Patent Agent. Although, if you are interested in a career at the USPTO, Dr. Fontainhas divulged that your science background is vital and you don't have to be a lawyer or patent agent to become a Patent Examiner. In fact, the USPTO offers extensive training for entry level Patent Examiners.

What are some warnings for joining these fields?

Licensing Manager: This field is neither for personalities that only want to do science, nor for someone who is difficult to work with or too opinionated.

Patent Examiner: You will love it or hate it. It could get boring or tiresome. You must be able to sit down and concentrate on a subject for long periods of time.

Patent Attorney: Similar to the Patent Examiner, you must be able to sit down and focus on one topic at length. Unlike the Patent Examiner, you might spend all day meeting with inventors and colleagues.

If you have great soft skills, enjoy working with people, and gain experience in TT, business, and/or law, you can be at the brink of new scientific discoveries without ever having to pick up another pipettor.

Laura T. Prestia, PhD, is a Technology Transfer Post-doctoral IRTA Fellow for the CDC Unit at the NIH Office of Technology Transfer (OTT). Prior to joining the NIH OTT, Laura received her PhD in Neuroscience from SUNY Upstate Medical University where she studied the impact of fetal alcohol exposure on postnatal flavor preferences and its implications for alcohol addiction. At the NIH OTT, her current training focuses on technology marketing, patenting and licensing practices, and negotiation techniques.

CLINICAL CAREERS

Career Options for Clinicians

Are you struggling to decide between the bench and the bedside? Then a career as a physician-scientist may be a good option for you! Panelists from this session discussed creating the perfect balance between both of their professional passions: clinical medicine and scientific research.

This session's diverse group of panelists included Jamie Freedman, MD/PhD, Senior Vice President of Clinical Development at MedImmune; Larissa Lapteva, MD, MHS, Division Director of Therapeutic Performance in the Office of Generic Drugs at CDER/FDA; Robert J. Noveck, MD/PhD, Associate Professor in the Department of Medicine at Duke University Medical Center; and Konstantina M. Vanevski, MD, Director of Experimental Medicine at Bayer HealthCare. The key points from the panelists focused on balance, knowing yourself, and background experience.

Balance

One of the most important takeaways from the panel was that if you are interested in both the clinic and the science, you don't have to choose one or the other. Some audience members worried that their future employers may not be willing to share their prospective employees. Although this might be the case for some, it is by no means the standard. For example, Dr. Freedman mentioned that "all of his employers were very supportive" of his desire to maintain working with patients. Of course, this type of split can be "demanding" but is one of the best ways to "keep in touch with the changing trends in medicine". Dr. Lapteva echoed these points and offered that balancing both worlds is great for professional development. She added that this is also a good question to ask at job interviews as it shows you are serious about maintaining or improving your clinical training skills.

Knowing Yourself

The panelists agreed that discovering their career paths was not by the most direct route, but rather through learning/knowing about themselves and matching those insights with the professions that would suit them the best. By gaining background experience, you can learn whether or not a position will jive with your likes and dislikes. Dr. Lapteva told the audience that there is not always an 'aha moment' so increase your exposure to different things and eventually you will gravitate toward the area of your preference. Lastly, gaining these experiences will make your skills more multidisciplinary, which is considered an asset to prospective employers.

Background Experience

The panel agreed that gaining background experience in the field makes an applicant more competitive for positions and help you decide whether these positions are right for you. So, how do you gain experience in this field? Dr. Freedman spoke about summer internship positions and that MedImmune is a good place to check out since they accept applicants with various degrees. Other options include: Shadow a clinical trial or look into the Food and Drug Administration (FDA) Commissioner Fellowship Program [Dr. Lapteva]; Google it and/or look within your institution - Many programs have summer internships like the one at Duke University's Nursing School or Clinical Research Institute [Dr. Noveck]; Take a course – The NIH Clinical Center offers an Introduction to the Principles and Practice of Clinical Research

course or refer to the NIH Office of Intramural Training and Education (OITE) website for jobs and internship opportunities [Dr. Vanevski].

So, if you have an interest in working with patients and reagents, strive for *balancing* both worlds and discover your work-life *preferences* by gaining *background experience* (this can also expand your skill-set and make you a more competitive applicant). What if you aren't sure that a career in both is right for you? Dr. Freedman offers, "Take a chance; you won't know if you don't take a risk."

Laura T. Prestia, PhD, is a Technology Transfer Post-doctoral IRTA Fellow for the CDC Unit at the NIH Office of Technology Transfer (OTT). Prior to joining the NIH OTT, Laura received her PhD in Neuroscience from SUNY Upstate Medical University where she studied the impact of fetal alcohol exposure on postnatal flavor preferences and its implications for alcohol addiction. At the NIH OTT, her current training focuses on technology marketing, patenting and licensing practices, and negotiation techniques.

INTERNATIONAL CAREERS

International Opportunities in Science – Europe

Beyond being an attractive destination for spring break or a semester abroad, Europe represents a great opportunity for scientists to develop international networks and broaden their skills. In this session, we were treated to three NIH alumni who have transitioned into EU-based positions in academia, industry, or clinical trials via conference call. Thankfully, there were no unexpected interruptions and the panel was clear, responsive, and insightful.

An obvious topic of frustration was the perseverance required when job-hunting. Sadly, the clichéd view that Europeans are more conservative than Americans held true. The panel endured 6-8 week waiting times for responses to an application, and employers were reluctant to provide compensation for flights during the interview process. Telephone interviews with recruitment agents were common in the UK, although video calls with scientists are also offered in other countries. Ultimately, the panel felt that with careful planning, research and a good appreciation for delays, it was worth the effort.

Despite the panel all possessing EU passports they offered encouragement for non-EU citizens hoping to relocate. The visa process is easier than the notoriously strict immigration regulations here in the States, but there is similar (if not greater) market saturation, although it helps if you can speak the native tongue of your intended destination. The work-life balance is also far more favorable than the USA, especially in industry. Thomas Geiger (Switzerland) and Christina Schindler (UK) both worked 38-42 hours per week, which was greeted with amazement (tinged with some jealousy, no doubt) from the standing-room only crowd. They do supplement their office hours with work at home, however. Efficiency quickly became a buzzword to describe the approach to daily tasks in European workplaces. In academic circles, Nuria Gavara (UK) also found that a shared lecture workload enabled her to enjoy greater flexibility to coordinate her personal life (up to 5 weeks' vacation! Paid!) compared to US colleges.

These relative freedoms are not at the expense of good science. Christina stated, at least at MedImmune (also located in exotic Gaithersburg, Maryland), that the 120 permanent postdoctoral scientists were expected to publish once a year, after they remove propriety information from their publications, of course. Similarly, Thomas was engaged with many diverse clinical projects and Nuria was rapidly expanding her lab personnel. Multiple sources of income, including charities and national or EU sources, allow scientists to obtain a diverse portfolio of grants, especially for staff and consumables (some difficulties with larger equipment purchases are common).

So start searching early and submit plenty of applications. Don't necessarily rely on your professional contacts to get you a foot in the door. Once you are settled, however, be prepared to focus on efficiency and hard work. And maybe enjoy some European culture!

Iain is a visiting postdoctoral scientist in the lab of Dr. Gordon Hager (NCI). In collaboration with his home laboratory (Dr. Mirek Dundr - Rosalind Franklin University, Chicago), Iain is characterizing the relationship between gene positioning, chromatin structure, and nuclear body formation in cancer.

