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Session Synopsis

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2014 NIH Career Symposium Newsletter

Finding a career that best fits your needs can sometimes be overwhelming. Thus, to help you navigate through the multiple career paths available out there, NIH held its 7th Annual Career Symposium on May 15, 2014. This event featured an extraordinary panel of speakers that shared their experiences and journeys to find their dream job. Also, it provided a unique opportunity for fellows to learn about bench and non-bench career options and to network with scientists working in different career paths.

Sessions covered a wide range of careers including academics, industry, science policy, science education, science administration, and science communication, among others. We asked an exceptional group of NIH graduate students and postdoctoral fellows to cover and write about the career sessions presented at the event. As a result, we produced this newsletter in which you will find short synopses of each of the panel sessions. We hope that this newsletter helps you gather all the information you need to prepare for your next career steps!

Enjoy!

2014 NIH Career Symposium Planning Committee
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Preparing for a Career in the Biomedical Sciences

Advice from Keynote Speaker Gail H. Cassell, PhD, DSc (hon)

“A career in the biomedical sciences is totally unpredictable” was the message highlighted in this year’s keynote address delivered by Gail Cassell, PhD, DSc (hon), Senior Lecturer in the Department of Global Health and Social Medicine, Harvard Medical School. It doesn't matter what path you choose first, whether it is academia, industry, government, or other; that path is going to change throughout your career. How do you best prepare yourself for this? Dr. Cassell laid out basic guiding principles that can help young scientists prepare for a career in the biomedical sciences in the context of the current and the future environments.

Engagement in scientific professional societies

Dr. Cassell first explained how the current environment is changing the field of biomedical research. The implications of scientific and technological advances as well as the major shifts in global economy, investments, and social dynamics that the world is experiencing influence how the American public and the government accept and critique science and its funding. In this environment, there is an increased demand for transparency and a rise in the use of performance metrics. Dr. Cassell stressed, “It is imperative [for scientists] to remember that educators, policy makers, and the public are the end users of scientific research” and thus listening to their questions is very important. She added, “Establishing sound science policies based on excellent science is your responsibility regardless of the career path you choose and engagement in professional scientific societies [and government advisory committees] is critical for accomplishing this goal.”

Becoming a great leader

Dr. Cassell predicted that “the next society,” as industry expert Peter Drucker referred to the future, will be an era of translational sciences with continued progress and revolutionary advances and that biomedical scientists will shape this next society in unprecedented ways. Because you are training at the NIH, which is recognized worldwide for providing the very best training environment and the best science, you are expected to become the future leaders. Dr. Cassell urged her audience to remember that leaders must define the values of the institutions they lead. “What you do is obviously important but HOW you do it is even more important.”

Maintaining good relationships with mentors and peers

How you exercise your influence on people is also essential. In this context, Dr. Cassell cited Bruce Alberts from Science magazine, saying “science is a remarkable sociable construct which relies on constant vigilance to maintain the standards that make it so successful.” Given that your mentors and peers are the source of everything you accomplish, it matters greatly how scientists treat their colleagues, share data and resources, and enlighten the public.

Seizing opportunities

Through personal examples, Dr. Cassell underlined how having clearly defined career goals is as equally important as being open to opportunities and following one's instincts. Saying yes to opportunities can change and shape your career for the best. The outcome from seizing these opportunities can translate into some of your best contributions to your field.

As keys to success in the challenging environment that society faces, Dr. Cassell recommended to be persistent and opportunistic. "There is no substitute for tenaciousness and perseverance," she repeated multiple times during her presentation. Don't give up and you will be successful in any aspect of the sciences you choose to pursue!

Patricia Kiesler, PhD, is a Postdoctoral Fellow in the Laboratory of Host Defenses within NIAID. She received her PhD in Genetics at the University of Arizona where she studied the transcriptional regulation of allergy-associated genes. Her present research focuses on understanding the molecular mechanisms involved in the development of ulcerative colitis. She is currently the Secretary of the NIH SACNAS Chapter and a member of the NIAID Fellows Advisory Committee.

Academic Careers in Teaching- vs. Research-intensive Institutions

This session explored the differences between common types of academic institutions to help an aspiring academic identify which environment will best suit them. No two schools are structured the same way. However, most professorships fit into one of four categories: teaching-only, teaching and research at a small college, teaching and research at an undergraduate college, and research at a research-intensive institution with a graduate/medical program.

While teaching-only professorships include departmental and institutional service requirements, the majority of your time is spent on lectures and lesson plans. Institutions classified as small colleges will have differing requirements as to what percentage of time is allocated to teaching, research, and service. In these places, professorships and research programs are fully funded with “hard money,” or funds guaranteed to you by the institution. PIs are always encouraged to obtain external research support, but this is not a requirement for your research or your paycheck. The last two categories, teaching and research at colleges and research at research-intensive institutions, are more varied as to the percentage of time devoted to teaching, with some having no requirement at all. As professorships at the former require some larger component of teaching, part of your salary will be hard money. Research-intensive institutions with minimal teaching requirements may have a policy where after your initial startup funds run dry, funds for your salary and your lab will not be provided by the institution. This “soft money” comes from grants.

From the descriptions above, you may have an inkling of which model appeals to you. The guests on this panel provided additional information to help guide one’s decision-making. Asked about funding at the various institutions, Paul Duffin, PhD, Assistant Professor from Transylvania University highlighted an excellent consideration when conducting science at a small college. Dr. Duffin’s laboratory research is almost completely conducted by undergraduate students. He said his research takes longer to complete and is focused on smaller biologically important questions, but that it is extremely rewarding to work with young, bright and eager scientists at this early stage of their careers.

A question about negotiating startup packages highlighted that no matter what type of institution you end up at, the time to negotiate anything – research funds, salary, staff payroll, lab and office space, even parking spaces – is during the hiring process. Zandrea Ambrose, PhD, Assistant Professor from the University of Pittsburgh School of Medicine shared the good tip of asking the department if you can inherit any equipment from labs that are closing. Kenneth Ramos, PhD, Professor from the University of Louisville stressed the importance of negotiating how your time is allocated – what percentages you will be expected to spend teaching, researching, and conducting required service.

Another question regarded the necessity of obtaining teaching experience, and Lilia Mijares, PhD, MLT, Assistant Professor from the University of Maryland School of Medicine contributed some astute points. Though Dr. Mijares is at a medical school, she conducts no

research and is primarily an instructor. She said that for teaching-heavy positions, it is absolutely imperative that a prospective candidate acquire some level of teaching experience. This experience can be from TAing, teaching at a community college, or giving a few lectures of a larger course (and note the OITE has a course, Scientists Teaching Science that has been useful). Of course, obtaining teaching certifications and attending formal training sessions will be helpful. However, your application may not be considered without actual hands-on experience.

Interestingly, all the panelists shared the same underlying theme for deciding which type of institution fits you best: know your personal reward system, or what kinds of job successes make you happiest. Ultimately, only you know the environment in which you will thrive.

Cynthia St. Hilaire, PhD, is a Research Fellow at NHLBI in the Laboratory of Cardiovascular Regenerative Medicine headed by Manfred Boehm, MD. She obtained her PhD in Biochemistry at Boston University School of Medicine under the guidance of Katya Ravid, PhD. Her research focuses on the mechanisms regulating vascular disease and remodeling pathologies and the development of in vitro and in vivo disease models.

Career Opportunities in the Federal Government

If you are looking for a career away from the bench in which the time you spent as a postdoctoral fellow is highly valued, try looking in the federal government. Indeed, the federal government considers your postdoctoral experience to be real work experience, not just a training period. In fact, all four of the panelists in the session on careers in the federal government did postdocs prior to finding a job away from the bench. The panelists unanimously referred to the postdoc as a “necessary evil” that a lot of federal positions actually require.

This year’s diverse group of panelists included Omari Bandele, PhD, a Review Toxicologist at the FDA who analyzes the toxicity reports of new investigational therapeutics or biologics; Amir Zeituni, PhD, a Senior Scientist with NASA Research and Education Support Services who acts as a liaison between scientists and administrators; Paul Nixon, PhD, a Special Agent with the FBI working in narcotics; and Anna Calcagno, PhD, RPh, a Management and Program Analyst in the Office of Finance at HHS who specializes in risk management of various funding programs. Interestingly, not a single panelist was interested in pursuing a career in bench science after their postdoc. This sentiment was also prevalent among many of the attendees.

When asked for advice for someone aspiring to be in a similar position after his or her postdoc, the one thing that all of the panelists stressed was the importance of interdisciplinary training. Take at least a few hours out of the lab to try something different, something that you really love to do. This will help you to figure out the career path that is right for you. Once you have an idea, start applying for jobs. See what is out there. The panel stressed that it is essential that you get used to rejection so that you come out strong when the right job comes along.

With regard to applications for federal positions, the panelists advised to become familiar with the USA Jobs website and the process for applying to jobs. The panelists also emphasized that just because you are most likely applying for these positions via USA Jobs (or FBIjobs.gov if looking for a position within the FBI) that does not mean you can stop networking. Each panelist was convinced that they got their foot in the door because of a personal connection. Human resources may reject your application based on various reasons even if you are a good fit for the position, according to the panel, so it is essential that you are able to get your application to the hands of the hiring manager. That is best done through internal connections. Therefore, it is important to meet as many people as possible during your training period. Here at the NIH trainees have the opportunity to network with plenty of professionals in federal non-bench science positions.

Finally, to debunk the rumors that federal benefits are not as good as they used to be or that it takes eons to move up the chain of command in the federal sector, the panelists wanted everyone to know that the benefits are still some of the best around and there is always room for faster advancement if you take advantage of opportunities such as details and lateral movements. Similar to the details that trainees are able to do as postdocs at the

NIH, federal employees have the opportunity to gain experiences and expand their skill sets in other offices while retaining their current positions. In addition, the panelists all stressed that lateral movements within the government or government contract positions are very frequent and common.

If you are considering a non-bench science career in the federal government, start by being honest with your mentors; tell them what your interests actually are for your next position. Then be sure to spend some time gaining experiences outside of the lab and when you are ready go ahead and start applying for jobs.

Bethanie Morrison, PhD, is a Postdoctoral Fellow in the Lymphoid Malignancies Branch of NCI. She is finishing up a project on metastatic triple-negative breast cancer and plans to use her research experience to promote funding for the most promising research endeavors via a career in science policy and program management.

Scientific Support Careers in Industry

Within five minutes of the *Careers in Industry* panel starting, one could realize what each of the four presenters had in common: every one of them is a "people person" and can talk to anyone about absolutely anything. Their jobs depend on it!

The speakers included Li-hong Zhang, PhD, a Technical Applications Scientist at Thermo Fisher Scientific, Sarah Teter, PhD, a Technical Services Scientist at Promega Corporation, Nicole Lewandowski, PhD, a Medical Science Liaison at Teva Pharmaceuticals, and Jill Hesse, PhD, a Senior Field Applications Specialist at Genologics. Each panelist answered questions honestly and wittily, was entirely open about the ups and downs of their careers, and explained the nuances of their day-to-day tasks.

Pros of careers in industry

Panelists emphasized that the opportunity to use "big ideas" and hone writing and communication skills with diverse groups of people is a plus. The ability to work from home and use of a company car were also mentioned. If you enjoy flexible schedules, you will appreciate that there is no such thing as a "normal day" in industry. Lastly, panelists agreed that job security in industry is relatively stable and there are plenty of opportunities to end up in other positions within the company once you are familiar with the products.

Cons of careers in industry

With frequent travel comes standard "travel hassles" and the lack of normalcy in schedule can be difficult for those who crave structure. On non-travel days, working from home can feel isolating without the company atmosphere. Moreover, when your home doubles as your office, it can be difficult to "unplug." One panelist indicated that she started to miss bench work and having her own projects. Administrative tasks and paperwork or regulations, particularly for those working in pharmaceuticals, can be mundane. Finally, although job security is stable, getting your foot in the door in industry can be challenging.

Advice for those interested in industry-related careers

The panelists encouraged audience members to ask for clear and honest expectations about travel time from the get-go: "50% travel" can mean Monday through Thursday traveling and the rest of the week at home, or it can mean six months in Japan and six months back in the US.

When looking for a position, don't be afraid to put yourself out there; LinkedIn is your friend. Use key words from the job requirements in your cover letter to make it through the first round of HR screening. Be open and honest with your potential employer about your qualifications and become familiar with the product and brand you might be representing. Make connections, find mentors, and "don't stare at your shoes during the interview - learn *real* communication skills" was the collective advice of the panel.

The diversity of the panelists was appreciated, as each had a very different career path and reason for ending up in industry. One panelist indicated that she wanted a PhD, but didn't

want to stay in the "ivory tower" of research, instead preferring to talk about science in a way that makes it applicable from a clinical standpoint. What was the take-home message? Expect the unexpected, be flexible, and put yourself out there!

Alyssa Todaro Brooks is a Graduate Student at the NIH Clinical Center. Her dissertation research examines the sleep patterns of recovering alcoholics. She holds a BS in Biobehavioral Health from Penn State University and is currently a PhD candidate at the University of Maryland School of Public Health.

Career Options for Clinicians

Everyone agrees that the costs of medical education and scientific training, lack of funding, and increased competition for resources represent obstacles to a successful research career. However, medical residents and fellows can practice strategies to enrich their career journeys. In this panel session, five expert clinician researchers shared their experiences and key points of their own journeys. They echoed a theme that was reinforced by their personal stories: most career paths are not linear. Careers are developed in a context of creativity, balance, and being a team-player.

Be Creative

Creativity is a key component to career development. “Position yourself for opportunities and seize them when they come,” said Jose Pablo Morales, MD, Medical Officer with the FDA, “Look for ways to be creative about your career and ask yourself what kind of a life you want live.” While Daniel Chertow, MD, MPH, Staff Clinician with the NIAID, agreed that physician-scientists need to have support from their mentor, “You also need to identify a path for yourself and have the drive and the practical ability to develop a career. The cost of medical education and how it impacts a young clinician’s decision on their career is very real. Look for loan repayment options.”

Be Balanced

“Look for opportunities to create balance and find a way to balance your family and personal life. Having people to rely on and help you meet your career goals is important. Keep your goals and keep your mentors with you,” said Barbara Knollmann-Ritschel, MD, CAPT, MC, USN, Professor of Pathology and Emerging Infectious Diseases at the Walter Reid Medical Center. Being balanced is also the ability to work on your career and use your creativity to consider alternatives. Robert Munford, MD, Senior Clinician and Deputy Chief of the Laboratory of Clinical Infectious Diseases in the NIAID, said, “Give it your best. If you enjoy it you will be successful. I don’t have a PhD but I set a 5-year plan. As an MD, you can fall back on your clinical skills if your first choice doesn’t work out.” Dr. Morales added that each clinician will need to find what works for them, “Honestly, quality of life was a deal-breaker. I chose a life to make family priorities.”

Be a Team Player

‘Team science’ is now the direction of academic medicine and it is an important part of how solid careers are established. Susan Shurin, MD, Deputy Director of the NHLBI, emphasized the importance of being a team-player at every phase of training and career development, “MDs, PhDs., and MD/PhDs. have different challenges; how you play with others will determine your success. You need to be a team player.” Team science also includes strengthening mentor/mentee relationships. Dr. Shurin looks for early career mentees that are motivated, passionate, and have a mission, “As a mentor, it is easier to pick up on that driving force and help a mentee achieve their potential when they say, ‘this is what I want to do and I could use some help.’ I got tremendously good advice from my residency

director early in my career: do reality testing. Start with a list. If you don't ask for it you won't get it. Only you will know what you need."

Forging a career in academic medicine is challenging but doable. Keep your goals and mentors with you, be creative and ready to change, and be an honest evaluator of your experiences. These skills will not only enable you to succeed as an academic clinician but they will help you in every area of team science.

Gioia Guerrieri, DO, completed three years of residency in Psychiatry at the Mayo Clinic; finishing her fourth year at the NIH. She is a third year Clinical Research Fellow at NIMH with the Intramural Research Program's Section on Behavioral Endocrinology. She is pursuing a career in women's mental health research.

Becoming an Entrepreneur and Working for Startups

Those who choose to pursue a career as an entrepreneur or a member of a startup company have one thing in common: they all believe that the risk of failing is worth the potential reward. All three of the entrepreneurial and startup session panelists exuded this passionate and fearless attitude as they discussed their careers and the tricks of the trade.

One of the most common questions asked of entrepreneurs is “how do I get started?” Based on the varied paths of the panelists, it is clear that there is no one right way to make it in this field. Grace Wong, PhD, the founder and CEO of Actokine Therapeutics, did a postdoc and worked at four different large pharmaceutical companies before she became her own boss. Her time spent at these companies allowed her to learn how a business operates and expand her network of colleagues, some who later became angel investors for her own company. In contrast, Matthew Mulvey, PhD, founded BeneVir Biopharm, Inc. based on a viral immunotherapy technology that he invented in graduate school. After graduating, he forwent a postdoc and landed a leadership position in a small, but established biotech company. At this job, he gained valuable experience in grant writing and starting clinical trials, which he later used to build his own company. Valerie Fremont, PhD, joined a startup company called Trophogen, Inc., where she is now the Director of Product Development. She acquired her job during her second postdoc when her advisor offered her a position in the biotech company that he was starting.

When asked how to acquire funding for a startup, the panelists had several suggestions. Dr. Wong suggested producing a large amount of data that will interest angel investors, which she prefers over venture capital funding. Dr. Fremont said that if you have a sound idea and network, venture capital firms might approach you. Whereas Dr. Mulvey found that venture capital firms are not interested in funding a business unless there is already clinical trial data. He suggested trying to start initially with a small amount of your own money or applying to the Small Business Innovation Research program for funds.

The panelists warned that one major factor to consider before jumping into this type of career is the lifestyle. While they all agree it is a very exciting and fulfilling job to have, it also requires long hours and a lot of hard work. Also, an entrepreneur or member of a startup must be prepared to live without a paycheck for months at a time if not longer. This may mean you need to save up ahead of time or make sure your spouse or partner can pay the bills until the company takes off.

Although no one likes to think about it, with any new business venture, there is the possibility of failure. One attendee asked how one would recover if their startup did fail. Dr. Mulvey responded immediately by saying, “you can’t be afraid of failure,” while also admitting it is good to prepare for the worst. His advice was to continue to network before, during, and after starting your company. He made the point that if your company didn’t take off, you could always ask one of your contacts for a job.

While becoming an entrepreneur or joining a startup is not for everyone, it can be the most stimulating and rewarding career for those who have the passion and drive to succeed. With a great idea, a sense of adventure, and a willingness to take a risk, this could be the career path for you!

Elizabeth Burke, PhD is a Postdoctoral Fellow in the NIH Undiagnosed Diseases Program (UDP). Her research focuses on elucidating the mechanisms by which UDP patients' genetic variants cause the clinical presentation of their unknown disorder.

Research Careers in Large vs. Small Companies

A new entrée on the symposium's familiar menu of industry panels, the session sparked a fresh, vigorous interest. Those job seekers in the audience, disheartened by perpetual no's from big companies, wondered if they would fare better with the startups. Those wary of the stress and shakiness of the latter were turning to the larger firms for stability and prestige. Those still undecided listened keenly in trying to gauge which way to steer. While no earth-shattering truths were disclosed, a few helpful overarching themes did emerge.

In a small company, you have to wear many hats; more is expected of a single employee. Yet there may also be more leeway to explore various options and ideas. A bonus of working for one of industry's leaders, on the other hand, is that resources are usually not limited. "If you have thought of a good experiment, it will get done," said Paul Santacroce, PhD, a Scientist at MedImmune.

Startup jobs are infamously insecure. However, even in an established company, these days, you can expect no more than a few years of stability. Layoffs are more common than ever. The good news is that having your foot in the door makes finding the next job easier.

Small firm or big, the job culture is vastly different from academia. In the lab, the chief motivation is getting a paper published. In industry, it is all about business and common goals of the group. Moreover, it is strictly a 40-hour week. "Our company has a very good work-life balance," said Sarah Rothman, PhD, a Senior Scientist at Merck. "We can telecommute and hours are flexible. I never, never have to come in on weekends."

The day-to-day skills needed to succeed in an industry job - critical thinking, problem solving - are largely the same as in any university lab, and are in fact those which scientists pride themselves on the most. That comes with the caveat that academic researchers are used to mostly doing things on their own, while industry compels employees to collaborate. A postdoc could be isolating; in a company, on the other hand, you have the opportunity to attend meetings, present data, and interact with other teams.

As the lines at the microphones refused to subside while the session went overtime, one recurring theme began to emerge in attendees' questions: startup or a blue-chip, how do you get in?

"Cold applying online does not really work," said Onyl Irrechukwu, PhD, a Scientist at Hepregen Corporation. "I sent out a lot of resumes. But it all came down to whom I knew - somebody who knows somebody who knows somebody, and so on." "When I saw the Merck job," recalled in turn Dr. Rothman, "I went on LinkedIn and was surprised to find that my former classmate works there. We connected and she gave my resume to HR."

Tailoring your resume to fit the job description is also important. Employers are looking for a particular set of skills rather than somebody who is accomplished or uncommonly smart. "I saw an ad that looked like a perfect match," said Aleksandar Stojmirovic, PhD, a Scientist

at Janssen R&D, a subsidiary of Johnson & Johnson. “When I got the job, they told me I was the only candidate who had what they wanted.”

All panelists agreed: when looking for a job, make sure you have the experience employers seek, find ways to distinguish yourself, exhaust all possibilities at hand, and, above all, grow a thick, thick skin.

Andrey Kuzmichev, PhD, is a Program Analyst at NINDS developing communication strategies for the Parkinson’s disease research program. As a former intramural postdoc at the Porter Neuroscience Center and then an investigator at the Lieber Institute for Brain Development at Johns Hopkins, he studied stem cells, reprogramming, and organ regeneration.

Science Administration Careers

A career in science administration is still a *science* career; it is just not a *bench* science career. Panelist Nina Gray, PhD, was quite adamant about this distinction, a sentiment echoed by other panelists. The Senior Manager of the New York University (NYU) Neuroscience Institute was one of four panelists discussing science administration careers. The panelists opened the session describing the diversity of their daily activities. These tasks include, but are not limited to, overseeing human resource departments, organizing faculty and student recruitment efforts, creating and managing funding opportunities, communicating science to broad audiences and analyzing data for different types of programs. For the remainder of the session, the panelists described the paths that led to their current jobs and advice for fellows who aspire to science administration careers.

There is no single path to becoming a science administrator. The most experienced panelist, John Alvaro, PhD, Director of Postdoctoral Affairs and Administrative Director of the Biological and Biomedical Science Program at Yale University left the bench at a time when most PhD level scientists pursued tenure-track positions. Thus, he was hired by Yale to run a graduate department without having administrative training or experience. Dr. Gray was a postdoctoral fellow in Boston when personal circumstances required that she move to New York. Her job search involved sending cover letters and applications for advertised jobs at places where she had no personal contacts. Dr. Gray eventually “got lucky” and was hired at the New York Academy of Sciences (NYAS) as a Program Manager. After three years, her boss at NYAS left to help develop the new NYU Neuroscience Institute, and Dr. Gray joined her. Gaia Vasiliver-Shamis, PhD, Scientific Program Manager at the NIAMS was particularly active during graduate school and her postdoctoral fellowship writing for her school newspaper and volunteering for organizations like the NIH Fellows Committee and the NIH Career Symposium committee. The experience gained through these activities allowed Dr. Vasiliver-Shamis to capitalize on a job opportunity suggested to her by her advisor.

One hurdle for fellows is gaining the necessary experience to obtain that first job. NIH fellows can participate in details to gain perspective and build a valuable portfolio of new skills that he/she would not likely gain from laboratory experience alone. (Go to <http://irp.nih.gov/catalyst/v21i2/details-details-details> for more information about details). Although details can provide in-depth knowledge about science administration, they are impractical for many fellows because of the significant sacrifice of laboratory time. Alternatively, Albert Avila, PhD, Acting Director of the Office of Diversity and Health Disparities at the NIAMS suggested that fellows express their interest in science administration to their branch chief, and request to shadow them. This provides insight into the administrative position, and establishes a network contact. To increase visibility and familiarity within the department, a fellow should also volunteer to give departmental seminars. As faculty and administrators become familiar with a fellow’s name and work, opportunities to gain experience outside of the laboratory may present themselves.

Although research should still be a postdoctoral fellow's priority, the panelists stressed it is equally important to build other skills. Having an established publishing record demonstrates to future employers that you are productive. Writing for blogs or newsletters refines a fellow's communication skills. Participating in committees develops organizational and management skills. Ultimately, the ability to multitask and persistence in pursuing objectives are key attributes that will help a fellow break into a science administration career.

Amie D. Moody, PhD, is a second year Postdoctoral Fellow in the Laboratory of Pathology within NCI. Her current research focuses on studying how the dynamics of transcription factor activity influence gene regulation.

Pre-Tenure Years - Teaching Intensive

Why pursue a teaching-intensive academic career? The thrill of observing the 'light-bulb' moments when students grasp new concepts all four panelists agreed. The panel composed by Paul Duffin, PhD, an Assistant Professor of Biology at Transylvania University, Carina Howell, PhD, an Associate Professor of Biological Sciences at Lock Haven University of Pennsylvania, Pumtiwitt McCarthy, PhD, an Assistant Professor of Chemistry at Morgan State University, and Brendan Rich, PhD, an Assistant Professor of Psychology at Catholic University of America was also enticed into their teaching careers by the promise of diverse workdays and interactions with excited and energetic students. Applying for teaching positions, typical duties, and tenure evaluation were topics discussed by the panelists.

When considering teaching positions, there are many possibilities, as responsibilities and teaching environments can vary highly. Therefore, the panel emphasized the importance of finding a position that fits your interests. While small liberal arts/private colleges with large endowments may have fewer budget constraints, they may also have fewer research facilities and faculty members, which may result in less support for teachers. On the other hand, larger/public universities currently have more budget constraints, however, they typically have teachers' unions and a greater number of facilities and faculty members that can help support new hires. The facilities a particular school has will also determine the types of research possible. In addition to school type and facilities, workload is another important factor to consider when searching for a teaching position. In particular, the number of contact hours with students every week, as the number of classes can vary widely by school.

After finding a school that is a good fit for you, it is important to sell yourself well with a thorough application. A good application does not only emphasize your academic achievements but also your potential contributions to the students, department, school, and community, underlined the panelists, as all these aspects impact the hiring process. Teaching experience, and if possible designing and teaching a class, look good on a resume. The panelists also recommended tailoring applications to specific positions, as each position is unique. Dr. McCarthy mentioned that taking classes on teaching at the NIH and volunteering or joining committees shows enthusiasm for teaching and helping the community.

Once you get your desired job, there are numerous tasks to juggle. In the case of the panelists, they all conduct research with undergraduates in addition to teaching. Most of them teach 3-4 days a week and have one day a week reserved for research. Maintaining the right balance between teaching and research as well as the right work-life balance can be challenging, admitted the panel, especially early in one's career. Drs. Rich and Duffin pointed out that tasks take as much time as you give them, making it necessary to set a defined schedule. Combining multiple activities into one can also save time. Dr. Howell added that bringing students to a conference, applying for a travel grant, judging posters and seeing new research (teaching, saving money for the department, community service, and research) could all be accomplished at once.

Teaching evaluations from students formed the bulk or all of the panelists' tenure evaluations. Several also had evaluations from colleagues within and outside their departments. Good research and support from colleagues can help with tenure, however, students are the customers at teaching-intensive institutions and thus it is important to keep them happy. This does not mean giving them all A's, panelists joked. Enthusiasm, interacting with students, and engaging them in the subject are all necessary skills as a teacher. Once these skills are mastered, light bulbs of understanding will flash for students every day.

Ben Blehm, PhD, is a first year Postdoctoral Fellow in the Tissue Morphodynamics unit of the Laboratory for Cell Biology, NCI, working under Kandice Tanner, PhD. His research focuses on developing new optical techniques to probe biological interactions. He received his BA in Physics from Grinnell College and his Physics PhD in the Laboratory of Paul Selvin, PhD, at the University of Illinois.

Big Data Careers

The notion that “more is better” is no longer limited to food, money, or AT&T’s 4G network; science has jumped on the bandwagon. As research is leaning towards more high-throughput data generation with microarrays, genome-wide association studies, and RNA sequencing; terabytes of information are accumulating yet their extrapolation into meaningful results is lagging. The need for experts that can analyze and make sense of these accumulated data is more important now than ever before. If you have a passion for data analysis, super-computers, and matrices of numbers, a “big data career” may be your niche.

Dr. Bourne, the Associate Director for Data Science at the NIH, is famous for his advocacy of open-access science to foster a more collaborative spirit in scientific progress. As expected, the session was heavily populated by graduate students and postdocs specializing in bioinformatics, but was useful for anyone considering a “big data career”, especially when Dr. Bourne made it sound so appealing.

As science is evolving, the job market is following suit, which means that whilst the field is experiencing a decrease in positions to generate data, there is an increase in positions to analyze data. Whether for better or worse, Dr. Bourne accurately pointed out, “The time spent sitting in front of a computer is steadily increasing in a research setting.” Academia, government agencies, and private sectors alike require the expertise of trained individuals to decipher data. Considering that a manuscript may only use a small portion of a large data set, the remainder of information becomes unavailable and possibly lost after a given amount of time. Thus, in order to avoid data burial and experimental redundancy in the scientific community, people trained to analyze, organize, and responsibly utilize data are high in demand.

The most advantageous part about a “big data career” is the versatility; whether in academia, industry, or the government, there are positions waiting to be filled with bioinformaticians and data analysts. For those who are not certain if this is an appropriate career choice, Dr. Bourne recommended to use open source software to become comfortable with different computer languages and testing the waters. The training required to master data analysis can vary depending on the data itself, inherent biological complexities, and the question at hand. However, most of the computer programs and algorithms involved in decoding data are interchangeable. This interchangeability allows bioinformaticians to dabble in numerous scientific disciplines and possibly bridge the gaps that exist between them. As a final thought, Dr. Bourne said, “Growth of data is a major driver in biomedical research,” but of greater importance are the people who pave the road.

Jaimy Joy is a Graduate Student in Immunology at Johns Hopkins University. She works at NIA in Baltimore. While a “big data career” is not her forte, she hopes to pursue a career in science education or science policy.

The Business of Science Careers

Postdocs often assume that they are not qualified to transition into a business career, however, there are several opportunities in the field that utilize and require a PhD. The panelists represented four career options within the business of science, each tailored to a different set of interests and strengths.

Jennifer Fortune, PhD, works as a Project Leader at the Boston Consulting Group (BCG). As a graduate student, she chose consulting because she liked academic science and problem solving, but had little interest in continuing as a bench scientist. Averaging 50-60 hours and three days of travel per week, Dr. Fortune's position at BCG requires her to act as the day-to-day manager of projects. She works collaboratively with the consulting team and clients to solve problems and achieve project goals. Having been involved in the hiring process, she explained that BCG and similar firms look for creative and analytical problem solvers that demonstrate passion and success outside of science. Dr. Fortune suggested focusing on skills that are relevant to consulting in your resume and using the cover letter as an opportunity to convince the firm of what you have to offer.

Another career option in the business of science is patent law. Sylvia Hsu-Chen Yip, PhD, works as a Technical Advisor at the patent law firm Oblon, Spivak, McClelland, Maier and Heustadt, LLP. Her position's responsibilities include writing patent applications and formulating legal arguments in response to the U.S. Patent Office. It also involves slightly more demanding and unpredictable hours. To obtain her position, Dr. Hsu-Chen Yip did a technology transfer internship during her postdoc and applied to the job through a recruiter. Her advice for getting into patent law was to do a postdoctoral fellowship, research the field before interviewing, and be tenacious.

As a Senior Scientific Manager at Thomson Reuters, Unni Jensen, PhD, performs research evaluation. Essentially, she helps institutions determine whether their programs are making an impact on disease research or how their own faculty members measure up to those at other universities. This involves data mining, project management, programming, analysis and technical writing for about 40-50 hours a week. Dr. Jensen took a slightly unusual path to get to this position. After working in finance originally, she shifted gears by earning a PhD in neuroscience, doing a postdoc, and then working in extramural grant management before getting her current position. Dr. Jensen suggested joining groups and organizations when looking for a job as she landed her interview through networking with the Women in Science group.

Working in a venture capital firm truly combines business with cutting edge science. Ian Chia, PhD, became an Associate at Harris and Harris Group, a venture capital firm, after finishing his postdoc. The firm's objective is to invest in promising new technologies in order to form a start-up company and then help it grow and become independent. Dr. Chia's role is to act as a project manager for start-ups, follow the progress of the firm's investments, and attend conferences to identify new opportunities. This job averages approximately 55 hours per week and seems to be a bit more family-friendly. To get into

this field, Dr. Chia emphasized the importance of networking and said to “be shameless” when doing so.

While most jobs in the business of science require slightly longer hours and a lot of hard work, those who succeed in it generally love what they do and enjoy the financial benefits as well. Thus, if leaving the bench while staying at the forefront of scientific discovery sounds appealing, getting into the business of science may be the perfect choice for you.

Elizabeth Burke, PhD, is a Postdoctoral Fellow in the NIH Undiagnosed Diseases Program (UDP). Her research focuses on elucidating the mechanisms by which UDP patients’ genetic variants cause the clinical presentation of their unknown disorder.

Pre-Tenure Years – Research Intensive

In an age where the vast majority of scientists seem to shrink from the pressure of academia, many continue to stand strong. Among them are the panelists of this session. These courageous professors shared stories of their challenging, but rewarding paths to success and advised trainees interested in academia on how to navigate the difficult academic job landscape brought about by the current funding climate. The panel was composed of Stefano Costanzi, PhD, an Assistant Professor at American University who completed his postdoc and served as a staff scientist at the NIH; Annalisa Scimemi, PhD, an Assistant Professor at the State University of New York Albany and also a former NIH postdoc; and Marc Adams, PhD, MPH, an Assistant Professor at Arizona State University. All three had a different path to success, but encouragingly left no doubt that there is a promising life after training.

So, what are the most important aspects to a job application to land a dream job in academia? The panelists emphasized the importance of publications, particularly the intricate balance of quality and quantity showing that you “left your mark on a field.” However, more important than number of publications, the panelists noted other critical qualities for getting hired by an academic institution. Numbers may help get you past an initial cut, or break a tie between two applicants, but a university wants to hire YOU – a person. To show you are a fit with an institution, you must convincingly demonstrate how your research goals will support the institution’s mission and how the institution can help facilitate your success. A past history of grant funding is one way that institutions assess your potential to contribute. Lack of a funding history may be considered a weakness for members of the NIH community who are not required to obtain external grants. However, this should be proactively addressed in the application package and interview. The panelists encouraged having an outline or written grant to help assuage the institution’s concern in this area and demonstrate a mindset and determination to bring in grant funding.

Next, the panelists discussed the intricacies of negotiating. The only time you can negotiate with the greatest leverage is after the job offer. However, it is important to discern the institution’s level of interest and gauge how much negotiating power you have. In general, negotiations for additional funding (both startup and salary) are difficult due to the practicality of funds available for that particular position. Developing a list of wants and absolute needs can help prevent appearing too demanding to the institution. Determine how much these things cost and expect that only a minimum of your requests will be met. On the other hand, it is by far easier to negotiate for non-cost associated items, like space and resources for students.

After accepting a position, but before starting, panelists encouraged maximizing this time to make essential preparations. For example, this would be the perfect time to generate necessary preliminary data and begin writing and possibly submitting grants. Another great piece of advice was to purchase all of the equipment needed ahead of time so you can hit the ground running on arrival.

Although a career in academia can be very challenging, the panelists listed what they love about their jobs. They find their jobs energizing and tremendously exciting because they have the freedom to do the research that drives them, ask the questions they want answered, and push the boundaries of science to make new discoveries while training students to do the same.

Michelle Reith, PhD, is a Postdoctoral Fellow in the Laboratory of Carolyn Beebe Smith, PhD, at NIMH. Her research is focused on the pathogenic causes of autism and the targeting of these causes for future therapeutic strategies. Her long-term career goal is to continue her pursuit of autism research in an academic setting, training and developing future scientists to pursue excellence in research.

Careers in Science Policy

“You can do anything you dream,” answered Tyrone C. Spady, PhD, Director of Legislative and Public Affairs at the American Society of Plant Biologists. He was responding to a question about whether one should stay within his/her field of expertise when entering into a career in science policy. Loretta Doan, PhD, Director of Science Policy at The Endocrine Society, admits she didn’t know what an endocrinologist did until she got her current position. In fact, science policy professionals may be required to use a broader understanding of science to influence research priorities, guide funding, summarize findings, and ultimately impact public health.

Dr. Doan explained that policy is multifaceted. Inward facing policy includes handling organizational issues, funding, and working with the NIH. On the other hand, outward facing policy includes advocating for her members and their needs while informing society about the science.

Communicating with both experts and non-scientists is a major aspect of policy. Dr. Spady represents scientists creating genetically modified organisms (GMOs). A big part of his job is changing “the dial of public dialogue when an issue is emotionally charged.”

“It’s a different world being in the office rather than the bench ... [it’s] a lot of group effort with no name reward and no authorship,” described Meredith A. Fox, PhD, an Analyst in the Office of Science Policy, Planning and Communications at NIMH. Her typical day is fast paced and includes responding quickly to congress and public inquiries on some hot button issues. However, Sandra Chapman, PhD, a Senior Program Analyst for the Office of Naval Research, says her job’s slower pace allows her to have a good work-life balance.

Dr. Chapman got her start in policy after participating in the American Association for the Advancement of Science (AAAS) Policy Fellowship program. Her advice to those applying for such fellowships: cast a wide net. She also cautions against selling the story that you hate bench science. The AAAS fellowship gives scientists experience in the policy world so they can return to their professional arena and act as a sounding board.

“It’s a disservice to only look at fellowships; details are great opportunities,” pointed out Dr. Spady, who entered the policy world after a detail with FASEB. Dr. Fox, who did a detail with her current office, explained that a detail is an opportunity to get loaned out from one office or agency to another for 6-9 hours each week up to full time for three months.

For more experience in policy, the panelists suggested joining your professional society to educate yourself on the issues, meeting with legislative bodies to discuss the importance of your science, joining the NIH ethics board or volunteering for a non-profit. “Everyone loves free help,” added Dr. Spady. In fact, you can also volunteer at private or government organizations.

Many of the questions asked of the panelists revolved around the timing of leaving the bench for a policy career. While a PhD was necessary for all of the panelists' jobs, the prerequisite may depend on the office. Similarly, doing postdoctoral research may not be necessary, but Dr. Chapman noted, "Experience and expertise will always be valued."

In fact, there is no time limit for entering policy, as many top officials joined their organizations after long and successful science careers. However, Dr. Spady explained that the longer you spend before entering the job market, the more you are cutting off your earning potential. He stated, "we are hiring people to do a job, not credentials ... if you know what you want to do, just do it."

Rachel Scheinert, PhD, is a Postdoctoral Fellow at NIMH in the Section on Functional Neuroanatomy. She received her PhD in Biomedical Engineering at the University of Florida where she studied neurogenesis and inflammation in relationship to age-related cognitive decline. Her current research focuses on the neuroimmune response to psychosocial stress.

Careers Getting a Product from Bench to Market

The career transition from PhD benchwork to commercial product development is complex and daunting. In this panel, three accomplished panelists shared their advice and personal experiences on that transition. As you plan for a career in industry and develop your skills toward this path, it is important to distinguish careers in project management (research and development scientists working collaboratively to move a project forward to completion) from product management (getting the product ready for market, distribution, and out to the client). Guided by questions from the audience, each panelist elaborated on their own career paths.

Responding to a question about how much experience in finance or market training potential new hires were expected to have, Raed Samara, PhD, Global Product Manager with Qiagen, noted that most companies do not assume many graduate students and postdocs have knowledge in finance or market training, “I developed these skills as part of the team. I got exposed to what they do and showed the managers that I can take that responsibility.”

Carey Rodeheffer Petrie, PhD, Project Manager with the EMMES Corporation, quickly replied to a question about effective skills for project management. She quipped, “Come apply at my company if you are told you are over prepared for meetings and events.” She emphasized the necessity to demonstrate, as a postdoc, the ability to work on several projects. Working with others on a variety of projects can demonstrate strong communication skills, the ability to prioritize and pay attention to detail, and other valuable transferrable skills away from the bench.

When asked about their opinions on job security and job related stress, the panelists touched on the expectations in industry and the kind of experiences one might encounter in their fields. “Our company is new and our infrastructure is in process,” said Bingwu Yu, PhD, Quality Assurance Auditor with Takeda Vaccines, Inc., “Our timeline is very tight. Don’t take it personally, it is for business. You don’t have to like it – just remember that you are in a business.” Dr. Petri added, “We don’t produce anything, we provide services. We respond to the client and do what we can to beat their timelines. It is stressful but it has job security. You are responsible to make the client happy, which results in getting more clients.” Dr. Samara replied, “It is hard. It can keep you up at night. My manager will look at my productivity and part of that is how much money I make. It is very stressful but exciting. You have access to resources to improve your performance but your job is potentially at risk.”

In conclusion, they each agreed that an important aspect of the PhD is learning how to think – to further develop critical thinking skills. Moving forward, in both project and product management oriented careers, it is important to understand technical details. Find out from teams what they need and when they need to get things done in order to help you get things done. Finally, although working for a company may seem unfamiliar to those

who have spent years doing benchwork, making the transition is possible. So don't be afraid to step out of your comfort zone and learn as you go.

Gioia Guerrieri, DO, completed three years of residency in Psychiatry at the Mayo Clinic; finishing her fourth year at the NIH. She is a third year Clinical Research Fellow at NIMH with the Intramural Research Program's Section on Behavioral Endocrinology. She is pursuing a career in women's mental health research.

Careers in Public Health

“Science AND...” This was the major theme in the session of Careers in Public Health. As researchers, we are quite familiar with the scientific aspects of our work; rarely will our knowledge base or lab capabilities be questioned. However, for those who wish to transition away from the bench, more work is required to fulfill the “and” part.

Many of us look at our many years of graduate or post-graduate experience and think that bench research is all we know how to do. However, we possess many skills and advantages that we are not even consciously aware of. The panel composed of Lindsey Garver, PhD, Clinical RM Contractor at Walter Reed Army Institute of Research, Patrice Held, PhD, FACMG, Co-Director of the Newborn Screening Laboratory at the University of Wisconsin-Madison, and Oliver Ou, PhD, Chemist at the USDA stressed the need to be good organizers, technical writers, and communicators. Some of them work with people who have a limited scientific background and by default become the resident “science Google.” Those who are not trained as scientists view it as a great asset to know where and how to navigate resources, review the scientific content, and then dissect out and translate pertinent information into a meaningful language. Whether they were directors of clinical labs screening disorders in newborn babies or leading clinical trials investigating malaria transmission, studying how to prevent cancer, or developing and reviewing protocols, all of the panelists had a unifying goal: trying to understand and minimize diseases at a population level.

A significant question that came up was if more schooling was required. While the majority of the panelists admitted that the idea of entering another graduate program after having powered through one all-consuming degree could be financially impossible or downright depressing, they all agreed that in order to transition into a new career, time and energy must be invested. A Masters in Public Health (MPH) will most likely make you an attractive candidate, afford you a completely new way of thinking, and change the trajectory of your career. However, there are other avenues that can be taken. In fact, three out of the four panelists do not have an MPH. Panelists recommended taking courses (online or through FAES), going on informational interviews, or doing an internship. Importantly, joining associations or committees allowed them to gain experience, become competitive, see if they enjoyed this type of work, and of course, network. One panelist said it best: “Networking isn’t just about handing out cards; it’s about who knows you, what you do, and how well you do it.” For her, networking not only helped her obtain her current position, but also built collaborations that she now relies upon.

The main point is to get yourself out there and do something. Try joining the Metropolitan Washington Public Health Association or searching for positions at Emory Public Health jobs. Search contracting companies such as Kelly Services or the Henry Jackson Foundation for positions; many times, jobs are listed here that may not be advertised on USAJOBS. Also, consider applying to various fellowship programs (e.g. Cancer Prevention Fellowship with NCI or Epidemic Intelligence Service with the CDC) where you can gain hands-on experience and possibly earn your MPH at the same time.

Careers that mesh science and public health require a wide range of skills. Invest your time in developing new skill sets if you need them. You're likely going to exhaust yourself moving into a new career, but you'll have to expend a little more energy to develop the "...and."

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

Bench Careers in Unexpected Places

Early career scientists are faced with choosing a career track based on familiar science job categories and developing the skills that would best suit these future career prospects. Little guidance is available, however, if your interests lie somewhere between the “traditional” career norms. The “Bench Careers in Unexpected Places” panelists discussed their personal experiences in obtaining research positions in the imprecise void between academia and industry.

The panelists arrived at their positions through unique trajectories. Ronald McKay, PhD, has held positions at prestigious institutes, which culminated in extensive publications. Due to his notoriety, he received a phone call while serving as a Laboratory Chief at NINDS and was offered to join the Lieber Institute as the Director of Basic Science research. As a postdoc at the University of Missouri, Jennifer Kimmel, PhD, was determined to become a professor. However, when her NIH grant support ran out, she was forced to find a new position in a short time. Realizing her passion for food, she walked the aisles of a grocery store, wrote down the names of manufacturers, sent her resume to companies, and eventually became a Food Scientist at Kraft. Michael Nestor, PhD, witnessed the U.S. economic crash as a postdoc at the NIH in 2009 and realized that the traditional scientific career path had less than a 20% success rate. As a trained electrophysiologist, he identified a need for his skill set and cold-called the Director of the New York Stem Cell Foundation to pitch his ideas; resulting in a job offer as a Staff Scientist the following day. Finally, Carley Shaut, PhD, D(ABHI), was unaware her current position at a clinical transplantation lab existed. She is the Technical Director of the Laboratory of Immunogenetics and Transplantation at the Oregon Health and Science University. After 4 years of formal fellowship training through ASHI, she is now board certified and runs a lab, performs research, and teaches.

In response to concerns raised by the audience about the fear of disappointing previous mentors for pursuing their career paths, the panelists advised to take a leap of faith, think for yourself, and keep open to all opportunities for your own future benefit. When exploring possible career options, they suggested considering what your postdoc and future career will mean to you scientifically and personally. Alternatives to the traditional postdoc were also mentioned, such as a co-op with a company or seeking a clinical research fellowship.

In terms of skills, the panelists agreed that communication, creativity, and individuality are critical. Scientists are trained in formal communication, however, soft skills are equally as important, especially outside of an academic environment. Acknowledging your own skills in order to build a niche and secure your own place on a team is advantageous both for your own confidence and for the success of the institute or enterprise. Finally, taking a personal interest in your work will ensure avoiding being psychologically dominated by the constant pressure to conform idealistically.

The panelists remarked that in general, the future of science in terms of funding is going to rely more on non-profit, privately funded institutes. They believe that universities will be unable to be at the cutting edge of research because they won't have enough money to keep up. Therefore, the establishment of new non-academic institutes will influence the goals of research in a broader range of fields and support scientists who feel that they belong somewhere between academia and industry.

To those who are considering taking a leap of scientific faith, in the words of Dr. McKay "If you are not in industry and not in academia, I would suggest to you that you are in the place where things are actually happening."

Rachel Van Duyne, PhD, is a Postdoctoral Fellow in the Laboratory of Eric Freed, PhD, in the Virus-Cell Interaction section of the HIV Drug Resistance Program at NCI. She received her PhD in Microbiology and Immunology from The George Washington University.

Being an Attractive Candidate to Industry

“If Albert Einstein himself came to me, maybe I would not hire him.” This somewhat regrettable confession made by one of the panelists, Daniel Marshak, PhD, Senior VP of PerkinElmer, captures in a nutshell the key message of the session: no matter how brilliant you are, at the end of the day, it is your fit with an employer’s immediate needs that will or will not get you a job. Apart from that, no radical secrets were revealed; no magic bullet solutions cast. Not for the lack of trying, both on the part of the panelists, representing two of the biggest biotech recruiters, and the audience packed full of able, determined applicants. It is just that the problem both are facing these days is truly staggering: if you have 500 people competing for a slot, how do you pull out the one pearl?

Jamie Stacey, VP of the recruiting agency Kelly Services, reminded prospective job seekers that they have to go through HR to get to those who can appreciate their research and their talent. “Key words are not a joke. HR people do not know science,” she noted. They typically ask recruiters to specify two or three words, which, if they were to show up on a resume, would ring out a great candidate. It is always important to remember that you are dealing with a lay person. Also, the best way to make your resume stand out is to have it reflect your command of the latest technology.

In academia, people often assume that they should be hired just because they are smart. However, Pharma runs a business; what matters there is how the new employee will help turn in a profit. Exploring more commercial options, such as doing a co-op postdoc, could help a PhD become more familiar with corporate culture, make him or her a more attractive candidate.

Staying attractive is also getting more difficult by the day. The industry workforce has changed greatly during the last few years, clogging the pipeline for the newcomers. It used to be that people would spend their entire career at one place. Now, they take on a project, pursue it for a while, and then transition to something new. Luckily, there are several biotech hubs, such as Boston and the Bay Area, where one or another new opportunity can always be found.

The panelists added a few “what not to do” anecdotes. Ms. Stacie recalled how somebody complained to her that there are not enough jobs for drosophila geneticists. “Don’t sell yourself as a drosophila geneticist,” was her advice. “Say instead that you are a molecular biologist who is good at using genetic models.” People often do not understand how to market their own talents.

Despite session’s overall sober, realistic mood, it ended on an enthusiastic note. “Novartis, Genentech, MedImmune do hire a lot of people from academia,” said one of the later questioners. “This is because they are often cheaper, but also because they – that is, you (the woman at the microphone looked at the people in the audience) - are better!”

Andrey Kuzmichev, PhD, is a Program Analyst at NINDS developing communication strategies for the Parkinson's disease research program. As a former intramural postdoc at the Porter Neuroscience Center and then an investigator at the Lieber Institute for Brain Development at Johns Hopkins, he studied stem cells, reprogramming, and organ regeneration.

Science Writing/Editing/Communication Careers

Are you both analytical and creative? Do you enjoy communicating with both scientific researchers and the general public? Do you prefer to discuss a breadth of scientific topics in seminars and journal clubs over conducting detailed research in the laboratory? If you find that you fit into any of these paradoxical descriptions, you may want to consider a career in science writing. Robert Taylor, PhD, co-founder and CEO of SAGE Analytica, explained that since his time as a dual chemistry and history major in his undergraduate studies, he found that he “had to use both sides of his brain.”

Each contributor to the Science Writing/Editing/Communication Careers panel agreed that diversity is the common thread between their jobs. Abby Robinson, PhD, Director of Communications with the College of Computer, Mathematical, and Natural Sciences at University of Maryland, does not have a typical day. Her writing topics span the fields of math and science and are disseminated through media outreach, press releases, and even social media. Because technology has accelerated the journal submission process, she must be able to multi-task and work at a fast pace. Kristen Mueller, PhD, Senior Editor at Science/AAAS spends 80% of her time reading, writing, and reviewing articles, 10% traveling and attending conferences, and 10% evaluating and guiding the field to focus on important scientific issues. In doing so, Dr. Mueller’s job allows her to focus on the most novel and groundbreaking areas of scientific research.

In this field, experience is everything, but Katherine Bricceno, PhD, Communications Managers at the non-profit AABB, moved to her full time position directly after graduate school. She did so by volunteering to write blog posts or newsletters pertaining to biomedical research during her graduate career. This is how she acquired writing samples, known in the field as clips. Dr. Bricceno stressed the importance of gaining experience before obtaining a full time job. Some options are to volunteer as a free writer, to contact your professional organization for opportunities, to apply for the ten-week AAAS Mass Media Fellowship, or to freelance. Freelance assignments can be found at the D.C. Science Writers Association website (<http://www.dcswa.org/>).

Many scientists who are thinking about pursuing a non-research career question whether their time spent earning their PhD was worth it. Rest assured because it was! All of the panelists agreed that because they work so closely with researchers, a doctoral degree gives them instant credibility. In addition, Dr. Mueller explained that her publication record proved that she was a consistent and dependable worker, which was critical in obtaining her first job.

Science, and the careers that are supported by it, is a moving landscape. All of the panelists agreed that they do not know where they will be in the future, in part due to the evolving economic models surrounding publishing. One thing, however, is certain. Scientific communications provides them with a creative outlet that still stays true to their research-oriented training. Dr. Taylor admitted that a winding path brought him to SAGE Analytica, but the skills that are needed for science writing are important across all fields. Remaining

at the frontier of scientific innovation, staying in contact with researchers, and practicing good communication skills will not only advance your career in science writing but will also provide opportunities within science policy, grant administration, or to oversee research at universities. Therefore, if you are someone who “[has] to use both sides of [your] brain,” science writing can reward you with a fulfilling, diverse, and evolving career.

Rachel D. Slack, PhD, is a Postdoctoral Fellow in the Medicinal Chemistry Section of the Molecular Targets and Medications Discovery Branch within NIDA. Her research focuses on the design and synthesis of small molecules that selectively target the dopamine D₃ receptor. She hopes to use these small molecules as tools to probe and explore the biological mechanisms underlying drug abuse and addiction.

Tenure and Beyond: Long-term Career Planning in Academia

A unique aspect of this career symposium was in the last set of panel discussions. More than just obtaining a career in academia, panelists in “Tenure and Beyond: Long-Term Career Planning in Academia” focused on the process of getting tenure and life beyond tenure. The panel was composed of highly respected leaders in their respective institutions. Kathleen Caron, PhD, is a Department Chair at the University of North Carolina Chapel Hill, Juanita Sharpe, PhD, is the Assistant Vice Provost at Virginia Commonwealth, and David Schneeweis, PhD, is the Deputy Scientific Director at the National Eye Institute.

How did the panelists rise to their current leadership positions? Paradoxically, they unanimously agreed that leadership is not given to the people who seek it out. Instead, positions of leadership are awarded to those people who show a certain degree of selflessness in their service. The three panelists practice the art of working for their respective departments. They assist others in their departments whether or not they get final credit for their hard work.

One of the important skills they needed for obtaining their current leadership positions was problem solving. Instead of complaining about problems, panelists find ways to fix them. Other necessary skills for becoming a leader are flexibility, being thick-skinned, diplomacy, and communication, which also includes listening.

Again, somewhat paradoxically, the best way to plan for a future in leadership is to focus on your current role. You are only elected as a leader if people know that you can get the job done. Leadership roles can be held in conjunction with pursuing research, but a critical balance between outside service and inside focus is needed. You cannot run a department until you show that you can successfully run a lab. You cannot mentor colleagues without showing that you can effectively mentor students.

Given that leaders are only selected from those who are selfless, someone aptly asked what gives the panelists personal satisfaction to motivate them in their leadership positions. The panel agreed that learning how to solve problems, sometimes in a creative way, is what gives their jobs meaning. They did not hide the fact that a life in academia could often be overwhelming and that these problems are often large in magnitude. However, those challenges only make their success more fulfilling.

The panelists laid out good strategies in the pursuit of tenure. Your pre-tenure years are the time to focus on your research as much as possible. During this time, you should only serve on a minimum number of committees. Be selective about your choice of these committees, making sure to be true to your passions and do something that will have implications on your research. “Learn how to say *no* strategically so that it sounds like *yes*,” suggested Dr. Sharpe. Do not go up for tenure too early because in your post-tenure years you are expected to devote more of your time to service. Once you have tenure, instead of volunteering for service, you will be asked to do things to support your department. Saying *no* at that point could be detrimental.

This was some of the advice the panelists gave on how to achieve success in academia and how to find balance between your own research and service to your institution. They find tremendous fulfillment in solving problems and giving direction to their departments. In this way, they feel like they are contributing to the future of scientific research. Their success is certainly a model to aspire to in our own career paths in academia.

Michelle Reith, PhD, is a Postdoctoral Fellow in the Laboratory of Carolyn Beebe Smith, PhD, at NIMH. Her research is focused on the pathogenic causes of autism and the targeting of these causes for future therapeutic strategies. Her long-term career goal is to continue her pursuit of autism research in an academic setting, training and developing future scientists to pursue excellence in research.

Careers in Science Education

“It all happens quickly when you find Nirvana,” responded Jeffre Witherly, PhD, Senior Advisor on Scientific Education at the NHGRI, when asked if he has enjoyed his career in science education. Dr. Witherly’s response echoed the other panelists’ responses during the Careers in Science Education panel. What does it take to have a rich and successful career in science education? The unanimous response: passion. Science education requires a passion for teaching, a passion to learn and grow as an educator, and a passion to share science with students, the public, and colleagues.

This year’s panelists come from diverse scientific backgrounds and all of them are enthusiastic and *passionate* about their career choices. Sitting on the panel with Dr. Witherly, Catherine Swanwick, PhD, works as Director of Life Science Programs at the start-up company Ideaventions. Ideaventions runs outreach science education programs for children and students K-8 that uses hands-on instruction to teach children basic science concepts. Dr. Swanwick is incredibly excited about her job but shared with the audience that working for an educational start-up can be difficult at times. She commented that teaching young children is a lesson in patience but the joy of seeing children discovering science makes her job worthwhile.

Joan McDermott, PhD, teaches molecular biology at the Walter Johnson High School in Montgomery County and is the faculty supervisor of the high school’s science Olympiad team. She encouraged those interested in teaching science in high school to be highly motivated but introspective about the challenges of managing a classroom of teenagers. Dr. McDermott discussed that her primary goal is to instill confidence, not content, into a new generation of young scientists. She wants to help spark her students’ interest in science and provide a foundational level of education that be built upon.

The panel was rounded out by Margaret Emblom-Callahan, PhD, Assistant Division Dean and Assistant Professor of Biology at Northern Virginia Community College (NVCC). Before becoming a full-time lecturer at NVCC, Dr. Emblom-Callahan began teaching as an adjunct-faculty and indicated that being an adjunct required a lot of time and effort for very little pay. She advised that teaching is not for everyone and it requires a deep desire in the educator to impart knowledge into blossoming scientists. She focused her discussion on the need to develop active-learning techniques to engage today’s tech-oriented youth. When asked about the challenges of teaching today’s youth, Dr. Emblom-Callahn replied that one has to think outside of the box and “sometimes there is no box.”

If you are interested in a career in science education, the panelists strongly recommended reaching out to other teachers and schools to inquire about opportunities to teach. There was consensus among the panelists that being proactive is the best way to find the necessary teaching experience required when applying for teaching positions. NIH postdocs are encouraged to email local high schools, undergraduate universities, and community colleges to inquire about guest lecture seminars or other opportunities to

discuss your research in front of a classroom. Schools may also offer the opportunity to serve as an adjunct-faculty for a semester.

All the panelists stressed communication as the most important skill necessary for a career in education. Any educator in the classroom or in outreach programs must be confident and able to talk with students and the public. So if you are interested in a career in science education don't be shy and go get your name out there!

Douglas Dluzen, PhD, is a Postdoctoral Fellow in the Laboratory of Michele Evans, MD, at NIA in Baltimore. He received his doctorate in Genetics at the Pennsylvania State University College of Medicine and he is currently investigating microRNA-related pathways in aging and hypertension.

NIEHS Biomedical Career Symposium Draws Hundreds

The 17th annual NIEHS Biomedical Career Symposium opened April 25 with a warm welcome from NIEHS Scientific Director Darryl Zeldin, MD. An estimated 350 attendees, eager for professional advice on next steps in their careers, filled the meeting rooms at the U.S. Environmental Protection Agency (EPA) campus in Research Triangle Park, North Carolina.

Dr. Zeldin challenged participants to design and commit to a plan for transition to a rewarding career in the biomedical sciences. “For many of you, the decisions you make over the next year or two will shape your lives as scientists for decades to come,” he said. “Better understanding of the various options available to you, and what it takes to pursue specific career paths, is absolutely essential for making those important decisions.”

Transitions through networking

Kristin Gabor, PhD, co-chair of the event, reiterated Dr. Zeldin’s remarks, noting that this year’s symposium focused on successful transitions into a variety of career paths. One foundation for a career transition is the development of a professional network, which is why the committee invited Alaina Levine, president of Quantum Success Solutions and author of the upcoming book “Networking for Nerds,” to deliver the keynote address.

Ms. Levine’s talk, “Accessing Hidden Career Opportunities Through Networking and Reputation Management” set the tone for the day. Using a medley of stories from her own experiences — and her signature comedic style — Ms. Levine entertained the audience, while educating them on the value of networking and self-branding.

“Upwards of 90 percent of jobs are gotten through hidden opportunities, which are made available to you from networking,” Ms. Levine said. She told how admiring the shoes of the woman next to her on a flight led to paying work — the shoes were on the feet of a congressman’s wife who needed help using humor in her speeches.

“You need diverse influences and diverse sources of inspiration — people who can give you new ideas and help you solve the problems you are trying to solve in your scientific discipline,” Ms. Levine added. “This diversity of sources comes from networking.”

Something for everyone

The day was packed with sessions, including ten expert panels from various career paths, ten career development workshops, and a networking reception featuring exhibitors from local groups and companies.

“We sought out speakers on a range of topics to support career transitions, from how to network and how to interview, to what steps to take to land that job,” said Dr. Gabor. “While we wanted our workshops to meet varied interests, the primary goal was to

showcase the plethora of opportunities available to those with a biomedical degree,” she added.

Organizers also arranged for 25 professionals to review CVs and resumes of more than 175 participants. The reviewers were categorized so attendees could choose the most appropriate expert in their desired career path, whether industry, government, or academia.

Postdoc-led event

The annual event, which is planned, organized, and carried out by NIEHS and EPA postdoctoral fellows, was an impressive display of teamwork and dedication to educating the scientific community about career opportunities and advancement strategies.

Co-chairs Dr. Gabor and Bethany Hsia, PhD, led a 25-member committee, which began work last fall. Committee members selected and invited panelists, organized arts and photography, managed facility resources, and led social media advertisement, earning transferable skills and developing contacts that will help them in their own career development.

The committee’s collaboration and effort was praised by Tammy Collins, PhD, Director of the NIEHS Office of Fellows’ Career Development. Dr. Collins assisted in behind-the-scenes planning and logistics, and the co-chairs noted that Dr. Collins’ experience and advice were invaluable.

Monica Frazier, PhD, is a Postdoctoral Fellow in the NIEHS Laboratory of Molecular Genetics, Mechanisms of Mutation Group. In addition to research, she is the chair of the NIEHS Trainees Assembly Steering Committee and a regular contributor to the NIEHS online newsletter, the Environmental Factor.