

HIGHLIGHTS FROM THE 2009 NIH CAREER SYMPOSIUM

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ACADEMIC CAREER TRACK

Academic Careers: What's Really Out There?

Cindy Chang, PhD

Patricia Sokolove, PhD, Deputy Director of the Office of Intramural Training & Education and former tenured faculty member at the University of Maryland Medical School, advised those considering a career in the academic sector to understand that it is, and always has been, evolving. She then described the changes in academic employment for PhDs in the biomedical sciences over the last 50 years.

Since the “Golden Age” of education after World War II and into the 1960s when federal investment in education increased by 15% a year, the number of tenured faculty positions has plateaued. More older faculty are staying in place since mandatory retirement was abolished in 1994, a decrease in new assistant professors being hired, and an increase in part-time and non-tenure track appointments, all contributed to this trend. At the same time, there has been a surge in the number of science PhDs earned by women. As a result, the rate of awarding doctoral degrees has outpaced the rate of availability of academic jobs by 3 to 4 times. Dr. Sokolove showed that the portrait of “tenured full professors conducting cutting-edge research in prestigious, research-oriented universities” is transient. The concept of tenure itself was not introduced until 1940 and may be on its way out. The changing nature of tenure is further illustrated by the fact that currently only 13% of the tenure granting medical schools guarantee total institutional salary.



More importantly, the portrait no longer reflects what most PhD grads end up doing or even desire. For example, among 23 graduates who were 10 to 12 years beyond their PhDs from the Yale Molecular Biophysics and Biochemistry program, only 8 (35%) were in academic positions, of which only 2 (9%) were tenured or in a tenure-track position (Mervis 2008). The majority of the remaining graduates ended up in the biotechnology industry. Another survey of doctoral students at UC Berkeley found that the proportion of those planning to pursue a career in research as a professor decreased from the beginning to the end of their PhD programs (Mason 2006). The concern with raising a family was likely to play a role in this decrease and was supported by the fact that these students ranked tenured track faculty careers at research-intensive universities as the least likely to be family-friendly among different career paths.

All hope for an academic career is not lost, however. In fact, the decreased interest of PhD graduates in doing research works to the advantage of those still hoping for a career in academia. Dr. Sokolove reminded us that the most driven and very best will always find academic positions. Additionally, there are a growing number of opportunities at master's and bachelor's institutions, which have traditionally focused on teaching, but where research is increasingly encouraged or required. There are also increasing opportunities for PhDs to do translational research at medical, dental, and nursing schools where students are more likely training to become practitioners than researchers. Looking to increase your chances of landing a position at a medical school? Dr. Sokolove's last tip was to take the excellent pathobiology class, Demystifying Medicine, taught by Dr. Irwin Arias offered at NIH.

Mason, Mary Ann and Marc Goulden. 2006. "UC Doctoral Student Career Life Survey."
(<http://ucfamilyedge.berkeley.edu/grad%20life%20survey.html>)

Mervis, J. "And Then There Was One," Science 321: 1622 – 1628 (2008)

Now What Do I Do? Making the Faculty Transition

Senta Kapnick

So you think you want to be an academic? Well, I hope you are prepared because, as the panel of *Making the Faculty Transition* made clear, managing a laboratory in an academic setting is no easy task. Representing both MDs and PhDs with clinical and basic science backgrounds, the panel offered insider tips on the intimidating transition to academia with one underlying message to new junior faculty: negotiate fiercely and balance carefully.

How does one obtain a faculty position in the first place? Not surprisingly, appointment goes hand-in-hand with productivity at the postdoctoral level. It is important to remember, however, that money reigns, especially in today's economy, so an applicant with grants would be particularly attractive. James Kreindler, MD, Assistant Professor of Pediatrics at the University Of Pennsylvania School Of Medicine, also pointed out that survival is dependent upon networking skills. Although this seems like a daunting task, visibility via the community should be your first priority, especially in the fastest growing job sector for PhDs – clinical departments.

Congratulations! You are offered a coveted faculty position and now have the pleasure of becoming not only a scientist, but also a manager, public relations expert, and a psychologist. First things first – *read the offer up front*. Surprisingly few people actually do this. This is your opportunity to put your career on the right track. Negotiation essentials include a slow transition into teaching duties and allowing for plenty of time to set up your laboratory. Avoid what the panel referred to as “Assistant Professor’s Disease,” i.e. *don’t be a “yes person”* otherwise you risk spreading yourself too thin. Lastly, be sure to use your network and establish a community to leverage resources. Shifting from postdoctoral duties to new-found research, teaching and service responsibilities was likened by the panel to being “hit over the head.” In an attempt to emphasize this paradigm shift, Pablo Sobrado, PhD, an Assistant Professor in the Department of Biochemistry at Virginia Tech, told the audience filled with bright-eyed future faculty to be prepared to come early and to stay late, because you are everyone. Oh, and order your -80° freezer early – they take six months to ship.

All of the panelists emphasized that long-term success as a faculty member is dependent on passion and “a real need to satisfy your curiosity,” as Maja Maric, PhD of Georgetown University’s Department of Microbiology and Immunology succinctly stated. Enthusiasm will only carry you so far though, so plan ahead. Seemingly minor skills such as protocol management can save hours of explanations to graduate students in the future. Regardless of how successful you are in the laboratory and the classroom, tenure is a constantly moving target in today’s academic institutions. Therefore we should all heed the unfortunate, but reality-laden advice of the seasoned Director of the Sackler Institute of Graduate Biomedical Science at NYU’s School of Medicine, Joel Oppenheim, PhD: be sure to gain skill sets applicable to other fields.

Recommended resources helpful in the transition process included Kathy Barker’s book, *At the Helm*, which contains interviews addressing a range of laboratory management advice, including how to hire post-docs and technicians. After all is said and done however, a smooth faculty transition can deliver all the successes you anticipate as well as the failures you do not foresee. With a solid support system at home, a lot of passion, excellent networking skills, and a little luck, making the faculty transition can be a rewarding experience.

POLICY CAREER TRACK

Overview of Science Policy

Sandra Chapman

Do your friends and family get an earful about how long it took you to obtain security clearance or to fill out an animal protocol or to book a work-related trip? I hate to break it to you, but unless they work in Building 1, they may not be the right people to tell. Lynn Hudson, PhD found the right people to tell in 2004 when she began a detail in the NIH Office of the Director.

She wanted to do something about the problems she encountered in the daily operations of running her lab in the Developmental Genetics Section of the NINDS. Within five years she was appointed the new director for the Office of Science Policy Analysis. Dr. Hudson had numerous fun and engaging stories about her experiences in science policy as well as helpful advice for trainees considering careers in this field.

Currently her office is preparing for the arrival of the new NIH Director by compiling a list of possible policy issues that will become the new focus of the office. Each new director likes to have a personal mission in order to leave a memorable legacy. Some of the most pressing issues include packaging good strategies for delivering the \$10.4 billion given to the NIH as part of the American Recovery and Re-Investment Act, rejuvenating the Clinical Center at the NIH, and drafting new guidelines for federally funded stem cell research.

Dr. Hudson described some of the qualities that would make a scientist well suited for a career in science policy. She described the field as ideal for people who like to have a broad, general view of science and how science affects our society. It is also for people who have a general interest in national health care and the hottest topics in science. A scientist hoping to build a career in science policy must be well read, able to absorb tremendous amounts of information quickly, and aware of the opinions of the public, congress, and disease associations.

Dr. Hudson encouraged young scientists who are passionate about the future directions of science to find ways to start getting involved. The AAAS Science and Technology Policy fellowship is a highly accredited program that places fellows in various government agencies and congressional offices. However, this program is very competitive and is restricted to US citizens only. Therefore, Dr. Hudson suggested many alternatives to consider that are equally engaging and valuable. The Christine Mirzayan fellowship offered by the National Academies, an independent organization that can handle more sensitive issues, is open to international applicants who have a J-1 or F-1 visa or are enrolled in a US university. Dr. Hudson also recommended that students investigate science policy opportunities internationally. The European Union has a reciprocity agreement with the US to welcome foreign scientists. Furthermore, there are opportunities within each institute to detail with their policy shop. Finally, Dr. Hudson recommended a Masters in Public Health and added that certain institutions or programs may even offer financial support for this type of continued education.



Science policy is a developing field and one that needs to foster awareness from the public to build support and to continue to grow. Dr. Hudson's comments helped explain why it is important to assist the public in understanding how and why the science in this nation operates as it does. If this sounds like the perfect fit for you, consider using the suggestions from Dr. Hudson to discover the world of science policy first-hand.

What's Science Got to Do with It? The Impact of Scientific Knowledge on Policy Making

Sukanya Raghuraman, PhD

If you have the ability to think on your feet, possess a capacity to roll with changing workplace scenarios, and enjoy being challenged by projects with widely varying job descriptions, you may be suited for a career in science policy according to the panelists at the incredibly informative session that covered the impact of scientific knowledge on policy making. The speakers included- Carrie Wolinetz, PhD, Director of Scientific Affairs and Public Relations for the Office of Public Affairs at FASEB; Adam Reinhart, PhD, Grants Administrator/Soil and Water Scientist at USAID; Edward Ramos, PhD, Science Policy analyst at NHGRI; and Brian Carter, PhD ACS/AAAS Legislative Fellow currently serving on Senator Edward Kennedy's Committee on Health, Education, Labor and Pensions.

How does one acquire the requisite skills needed to operate in the somewhat amorphous world of science policy? Dr. Wolinetz suggested that during the course of a PhD and postdoctoral stint, scientists automatically become equipped with all the qualities needed to succeed in this field, such as the ability to glean the essence of an article from complex data and to adapt and change direction when the situation demands (for example when an experiment fails.) The other panelists stressed the need for a good mentor and a productive relationship with that mentor in order to learn the tools of the trade.

Is a policy fellowship mandatory for someone wishing to pursue a career in science policy? The panelists revealed that, contrary to popular belief, fellowships are well paid, but the need for one may be circumvented by building up one's resume even while working in the lab. Opportunities for volunteering exist with the National Postdoctoral Association (NPA) and at scientific society offices among others. Dr. Carter suggested that a lack of a proper fellowship in science policy could be advantageous in some cases, as some employers would consider trading experience for a fresh perspective.

Since many policy fellowships require U.S. citizenship, what can a non-citizen do if he or she is interested in a fellowship experience? Dr. Wolinetz revealed that fellowships awarded by the National Academy of Sciences are open to non-U.S. citizens while Dr. Reinhart asked the audience to explore the possibility of working in U.S. missions in their own home countries where there would be no citizenship restrictions.

Unconventional backgrounds need not be a deterrent to potential policy job seekers. In this regard, Dr. Wolinetz gave the audience a sound piece of advice: To get the job you want, you should start by applying for one. She clarified this by explaining that the job search should be a no-holds-barred process which should include, among other things, informational interviews which help to define the specific skill set an employer is seeking in an ideal candidate.

When discussing work-life balance, Dr. Ramos indicated that for those pursuing a science policy fellowship in legislation there could be phases when the job becomes very intensive. There is, however, a great deal of flexibility depending on the chosen branch of science policy. For example, policy analysts involved with long-term research projects may have more leeway than someone involved in legislative science policy.

The range of experience, advice, and enthusiasm that the panelists shared at the session was truly valuable to scientists who are considering using their scientific backgrounds to improve policy-making.

Who's Driving This Thing, Anyway? Prioritizing and Guiding the Direction of Scientific Research

Sandra Chapman

You do not learn to drive a car by reading a book. Likewise, the panelists at this session agreed that for developing a career in science policy skills are more important than knowledge. The panelists represented a diverse group of experts who all influence the direction of scientific research in this country. They provided great insight for the audience about their career paths and answered questions about their day-to-day activities.

At the National Academies, Sujai Shivakumar, PhD, the Senior Program Officer for the Board on Science, Technology, and Economic Policy, analyzes what drives research and development, innovation, and entrepreneurship. Specifically, he is working on developing innovation policy, an idea aimed at getting states to re-invent themselves by developing new technology. Dr. Shivakumar believes that the traditional view of the private sector independently driving innovation needs to change to one where cooperation between the government and private industry stimulates progress. A trained economist, Dr. Shivakumar's background offered a unique perspective and a good example of the diversity in the field of science policy.

Paul Scott, PhD, the Director of the Office of Science Policy and Planning at the NINDS, ensures that the Institute makes the best use of the money it receives. His office is involved in evaluating the efficiency of old programs and determines where the NINDS needs to focus attention for future planning. He commented on the continued tension between patients who believe that research should focus on curing disease and the scientific community who tend to focus on scientific discovery, including basic research. Dr. Scott quoted Christopher Reeves who said, "This is the National Institutes of Health, not the National Institutes of Science."

Stacie Propst, PhD is the Vice President of Science Policy and Outreach at Research!America, a non-profit alliance of approximately 500 member societies. During her graduate work, Dr. Propst took a nine-month hiatus to "soul search" and re-evaluate her career goals. She began networking to explore opportunities beyond the bench. This detour eventually led Dr. Propst to the awareness of her passion for a career working to build and support research in the U.S. Dr. Propst explained that the goals of Research!America are to strengthen the voice of their member organizations in the legislative process and to provide evidence-based information to the public in order to raise awareness of the need for medical research funding.

Good writing and communication skills are essential for careers in this field. It is critical to be able to convey information efficiently. In addition, savvy in building and maintaining relationships is advantageous. Science policy is dependent on social interactions and therefore it is important to be diplomatic in your encounters and to avoid burning any bridges.

In the end, the audience learned "who IS driving this thing anyway?" Dr. Shivakumar believes that crafting a hybrid engine of both the public and private sectors of science will lead to the most efficient structure. Dr. Scott designs the Global Positioning System or GPS for Science, determining the direction to take his Institute to satisfy all of his passengers or constituents. Finally, Dr. Propst provides the fuel for this thing, making sure that the vehicle has the resources it needs to keep on chugging along.

INDUSTRY CAREER TRACK

Industry Careers: What's Out There?

Raed Samara, PhD

Only 15% of postdoctoral fellows eventually secure a tenure-track academic position while 35% end up working in industry and the rest for government or non-governmental organizations. Thus, more scientists are leaving the path of the academic ivory tower in search of other career opportunities.



The session, Industry Careers: What's Out There, highlighted some of these unique opportunities. The speaker, Randall Ribaud, PhD is the President and CEO of Human Workflows LLC. He provided insight into the culture of industry and what can be expected from the field. So what is out there other than bench research? There are many options for scientists outside the lab, and different types of businesses including large pharmaceutical companies, biotechnology enterprises, medical device and diagnostics companies, and non-profit non-governmental organizations (NGOs) offer unique advantages and disadvantages. Within these institutions, there is a wide spectrum of positions available for PhD-level scientists such as project managers, product development executives, field application specialists, and directors, just to name a few. A great example is a company called Illumina, Inc., which sells genotyping, gene expression, and sequencing equipment, but offers positions ranging from scientists to group leaders and executives.

But why pursue a career away from the bench after working so long and hard for a PhD? Many scientists realize that a career at the bench is not the best fit for them. Additionally, when thinking about the bigger picture, some researchers realize that scientific discovery starts at the bench, but often its fruits are realized when the idea becomes commercialized. The scientific methodologies of collecting data, analyzing results, and problem solving can also be applied to various aspects of biomedical development.

Scientists working in industry often excel since, by virtue of their training and everyday responsibilities, they acquire skills that can be applied to a variety of positions outside of the lab. The NIH is a great place for learning, and the skills scientists can acquire here are unmatched.

Networking seems to be the magic word in job hunting. Remember, the pool of highly qualified applicants is large. Knowing someone who can put your resume on the top of the pile and put in a good word goes a long way. In general, networking is one of the most feared aspects of job-hunting, especially for scientists. However, a diverse range of networking opportunities exists. One can join professional organizations such as the Rockville Economic Development, Inc (REDI), or online communities like LinkedIn (linkedin.com) or Plaxo (plaxo.com). You may not be directly introduced to the hiring manager, but instead end up meeting his or her colleague. Another way to network is to take advantage of the events hosted by the Office of Intramural Training & Education. Illumina, Inc. was recently invited to the Bethesda campus to discuss current openings and to recruit employees.

To make the leap into an industry career, have short- and long-term strategies that define the skills you need to develop and a plan for acquiring them. Emphasize your skills based on what the company does and be creative in describing your qualifications. Try to learn the language of business. Knowing what ROI means might go a long way to helping a transition into a business environment.

Industry Careers Away from the Bench

Heidi Schambra

When asked to recall the greatest difficulty he faced in adjusting to an industry job, Rob Genuario, PhD spoke earnestly. "I had to get used to it still being light outside when I left work."

Four panelists, each with doctoral degrees in the biological sciences, spoke about their current careers, their transition to industry, and the benefits of being in the science industry. Marija Tesic-Schnell, PhD, a Medical Science Liaison, serves as a link between the research and development group at Abbott Laboratories and the scientific community. Dr. Genuario, a Regional Account Manager at Illumina, Inc., works in sales of their newest generation of technologies. Timothy Caven, PhD, a Technical Sales Associate for QIAGEN, helps scientists understand and use the company's products and technologies. Michael Alekshun, PhD, Associate Director of Research and Development Licensing at Schering-Plough, evaluates new opportunities for licensing technologies created by smaller companies.

While the panelists all stated that their current skills were largely learned on the job, they did note a few acquired skills that can aid the transition. One universal job requirement is being able to communicate a scientific idea to audiences with a range of scientific backgrounds.

Dr. Tesic-Schnell said that public speaking enhances this skill, suggesting journal club as a venue for practicing more formal presentations. Dr. Alekshun recommended developing sales pitches — about oneself. "Come up with a 60-second infomercial about yourself. First talk about what you've done, then talk about what you want to immediately do, then talk about what you want to do in the next 5 to 10 years. Then cut it down to 30 seconds." This exercise not only serves the practical purpose of telling potential employers why they should hire you, he explained, but also serves as a rehearsal for promoting a company's purpose and product.

And what about finding that first job? All panelists said that their companies are hiring despite the dismal economy, especially applicants with PhDs. Dr. Caven suggested using networking websites, such as www.linkedin.com, to make contacts, send resumes, and search the job bank. All panelists spoke to the power of networking -- talking with friends, colleagues, and sales representatives about potential leads.

Dr. Tesic-Schnell urged job seekers to have flexibility, and to not become discouraged if the options are not perfect. She cited her own first job, noting the invaluable experience of learning the language, infrastructure, and culture of a business organization, even though it was not her dream position.

"The next job you have will not likely be your career in 30 years," Dr. Alekshun agreed. "You may have to take one or two jobs before finding the job that works for you. Apply to and accept a job that kind of sounds like the one you want to do, gain experience, and after a time, move on." Dr. Tesic-Schnell further added that if you do move on, you are more likely to be hired having come from a known company, compared to a 'free agent' without a business track record.

What kind of life awaits those who have made the leap? The panelists all spoke of their happiness with their current job, with no regrets for leaving the bench. In all positions, they interact as intellectual peers with researchers in the scientific community. They continue to learn about new scientific areas and technologies. Dr. Alekshun noted that most companies promote a healthy work-life balance, with options for flexible hours and working from home. Dr. Caven concurred, "if companies want to retain their employees, they have to keep them happy."

Finally, all spoke of the satisfaction of working in a meritocracy, where what they accomplish — not the length of their workday — is rewarded.

They all agreed that for scientists with honed communication skills and an eagerness to learn the new terrain and language of science industry, a career in this field can be intellectually invigorating while also offering a strong work-life balance.

GOVERNMENT CAREER TRACK

Government Jobs: Inside the Lab

Diana Ma, PhD

If you are interested in working for the government and staying “at the bench,” then the information in this session is for you! The panel consisted of two NIH Staff Scientists, a Federal Bureau of Investigation (FBI) Forensic Scientist, a Biochemist for the Navy, and the Director of Labs for the Maryland Department of Health. No two panelists had the same job description and their experiences were as varied as the positions they hold.

Staff Scientists work for the Principle Investigator (PI) of a lab. They may run the day-to-day lab operations while carrying out experiments. They also interface with post-docs, helping to guide their projects. Additionally, they may be involved in other lab functions such as patent applications and writing papers. Both Enrique Zudaire, PhD and Ana Robles, PhD began their careers at NIH as post-docs and negotiated positions as Staff Scientists with the PIs of their labs as a natural progression of their work. Other Staff Scientists are hired from outside positions.



Melissa Anne Smrz, MS, Deputy Assistant Director for the Forensics Analysis Branch of the FBI, described a variety of possibilities for people interested in working in the lab. The FBI employs investigators in all forensic fields including serology, genetics and fingerprint analysis. They also have positions working with hazardous materials and as weapons of mass destruction (WMD) operations response scientists. The Department of Defense (DOD) has a similarly wide array of interests.

State and local public health, environmental and forensic laboratories offer opportunities to conduct applied research, become familiar with public health and regulatory analytical programs, and gain useful experience in laboratory management. They have positions for doctoral-level specialists, including microbiologists, molecular biologists and environmental chemists, as well as geneticists interested in screening for hereditary disorders.

Beyond the job description, each career path offers different benefits. State and local laboratories offer a wide choice of geographic locations to start a career. Alternately, if you like to travel, some positions (e.g. the Navy and FBI) may be more attractive. Lt. Jason Schmittschmitt, PhD travels approximately two weeks of every month in his position as a training officer with the Navy. U.S. Citizenship is a requirement for the FBI but not for other employers represented, including the DOD.

If you are not yet ready for a “real job,” many government agencies have internship opportunities and the FBI has a program for visiting scientists. Finally, remember that the government works with many contract (industry) employees, so you may also want to consider positions with consulting firms.

The bottom line is that there are a plethora of opportunities in the government for you to stay at the bench!

Uncle Sam Wants your PhD: Government Jobs Outside the Lab

Orlando Lopez, PhD

Is the federal government a good fit for new or existing PhDs seeking careers outside the lab? Working for the government has its pros and cons like any other career path in industry or academia, and the one you choose ultimately comes down to your personal and professional needs, vision, and aspirations. There are many well-paying and interesting jobs available in the government today that lack the glass ceilings of industry and academia for scientists. In fact the federal government is actively seeking talented, enthusiastic individuals with advanced degrees in science to fill strategic roles outside the lab (www.usajobs.gov).

The five panelists in the “Uncle Sam Wants your PhD” session included representatives of a variety of careers for PhD's within the federal system. Diana Bensyl, PhD, CDR is a senior epidemiologist with the Centers for Disease Control and Prevention (CDC), Maureen Beanan, PhD is a program officer at NIAID/NIH, Rita Devine, PhD, is the assistant director for science administration at NINDS/NIH, Michelle Hamlet, PhD is training program coordinator for NHGRI/NIH and Ellen Olson, PhD is a consumer safety officer with the Food and Drug Administration (FDA). Their experiences and terms in their current posts varied as much as their particular job titles, but all the panelists appeared to be very successful and satisfied with their career choices.

How does one land a job with Uncle Sam? The panelists spoke highly of the many fellowship programs available at different government agencies as a point of entry into a permanent position. These programs or other training opportunities can provide exposure to a wide range of topics at different levels of responsibility across agencies. Programs such as the Presidential Management Fellowship and the Emerging Leaders Fellowship offer unique opportunities to gain insight on how the government works and to network towards a permanent position. Although many government jobs will require U.S. citizenship or residency, fellowship opportunities do exist for foreign scientists with the FDA, the CDC and other agencies. Non-citizen post-docs should do their homework and seek creative means to land a position in the government without letting their status get in the way.

So why work for Uncle Sam? The federal government is very good at providing funds for staff training and skill development. Job performance tends to be measured by government wide assessment tools and feedback is readily available. The pay is good, and once you are in the federal system, you can change positions while retaining your years of service for retirement. Overall, it sounds like Uncle Sam offers great opportunities for those seeking careers with growth opportunities, particularly at this time in our nation's need.

APPLYING SCIENTIFIC TRAINING TO OTHER FIELDS

From Bench to Bank: Breaking into the Business World

Raed Samara, PhD

“The business world is a social enterprise,” said Arthur Tinkelenberg, PhD, a partner for Ascent Biomedical Ventures in response to a question about the necessity of a Masters in Business Administration (MBA) for postdoctoral fellows to get a job in today’s business market. His sentiments were echoed by the other panelists Tracy Laabs, PhD, a technical consultant for Strategic Analysis Inc, and Ingrid Lund, PhD, a consultant for the Advisory Board Company.

Two attractive options for scientists looking for careers away from the bench and leaning towards a business-oriented path are biotech venture capitalism and management consulting. A venture capitalist invests money in early stage biotechs, reviews business opportunities, and reads up on the latest research. In addition, he or she formulates business strategies and sits on the boards of biotech companies to review their progress. Management consulting comes in several flavors. A management consultant can work on engagement assignments such as assisting clients with their toughest challenges (for example, developing the cancer Biomedical Informatics Grid - caBIG) or evaluating and solving business or organizational problems. Consultants also work at membership-based firms that identify issues keeping their clients awake at night and resolve them. Additionally, they can serve as a defense contractor involved in idea generation or evaluating research funding.

The panelists suggested that internships and fellowships are effective ways to break into the business world with scientific training. Skills needed to excel in this field may seem distinct from those gained at the bench, but, in fact, many non-technical skills acquired in the lab such as leading research teams, mentoring others, or managing budgets can be leveraged. Leadership skills are measured by how well you help others succeed, for example, helping lab mates plan experiments or analyze data.

There are numerous ways to develop these soft skills outside of the lab as well. One easy way is to join and participate in professional societies. The NIH offers a plethora of such organizations including the Fellows Committee (FeCom) and the Association of Women In Science (AWIS) among others. Not only do these organizations help you improve interpersonal and leadership skills, they also allow you to build a network of contacts. Employers know that, by virtue of their training and daily activities, scientists possess analytical, problem-solving, and critical thinking skills. They need to be convinced, however, that a potential employee has developed these soft skills. Thus, they should be emphasized on a resume and reinforced during an interview.

Concerned about losing a passion for science or medicine by moving into the business world? Following a different career path does not mean abandoning science. In fact, in these career paths, the analytical skills gained during the scientific training process are critical for staying at the cutting edge of science and technology, though from a business perspective. Furthermore, the projects in this field may have a faster impact on science and medicine than bench or bedside work. Performance evaluation and success metrics are also factors to consider when transitioning away from the bench. In science, the number and type of papers published determines success. In business, every project is evaluated by the creativity displayed, the ability of the team to work together, and the delivery of the final product.

Let's Talk Science: Communicating Science to the Public Thabisile Ndlebe, PhD

Do you enjoy explaining the latest scientific breakthroughs to your non-science colleagues? Do you love talking about science? Then maybe you should consider a career in science communications.

What is Science Communication? Kirsten Sanford, PhD, a science media producer for the Science Channel and the host and founder of “*This Week in Science*” radio show/podcast described science communications as “communicating science to the people.” Science communications target different audiences with varying levels of scientific knowledge. A number of fields such as writing, marketing, media and journalism are encompassed in science communications.

For that reason, those hoping to enter this career path must have a unique skill set that includes writing, knowing business etiquette, networking, and acquiring computer skills. Dr. Sanford is a good example of the variety of proficiencies needed. Her career as a producer requires her to play a number of different roles including being a reporter, camerawoman, soundwoman, and writer of her own scripts. A willingness to acquire expertise in areas that fall outside the usual scientific skill set is required for this career path. Dr. Sanford also stated that one of the key ingredients to her success was keeping abreast of the latest communications technologies.

As the number of major scientific breakthroughs increase, so does the need to better inform the public. Due to their complexities, the implications of these breakthroughs are often lost to the general public. As a result, there has been a growing need for science communicators who can reach a myriad of target audiences. For example, media relations teams function mainly as intermediaries between the media and the specific institutes they represent. As the Director of the Basic Science Research Communications and Media Relations Department at Johns Hopkins Medicine, Audrey Huang, PhD and her team pitch story ideas, respond quickly and accurately to reporters’ information requests, and generate media attention to assigned issues. Dr. Huang mentioned that some of the key ingredients to her success were managing different relationships well, and being able to work under tight deadlines.



In corporate communications, Cynthia Isaac, PhD, a Senior Vice President at Ogilvy Public Relations Worldwide, recently put together a successful global disease awareness photo campaign for multiple sclerosis. Her experience in corporate communications mainly covers communications targeting audiences within or outside a company such as employees, patients, or investors. Her work also includes responding to requests from the media, and organizing informational programs that maintain public support.

Medical liaisons communicate product related scientific and medical information to external healthcare providers, policymakers, and thought leaders. They perform scientific inquiries without promoting their company’s products. Marija Tesic-Schnell, PhD a Clinical Science manager at Abbott Laboratories, stressed the importance of medical liaisons’ maintaining personal integrity and compliance within their work.

A common thread among the panelists' stories is the extensive use of their personal networks to research these career paths prior to making their final transitions into the science communication field. Dr. Huang used her contacts to explore different career options. She also suggested gaining writing experience right away. Dr. Isaac mentioned the importance of having the tenacity to overcome many initial challenges, while Dr. Tesic-Schnell encouraged being open to working your way up to your dream job. While listening to these different science communicators, one could not help wondering whether these panelists had found that wonderful gem – a career they completely enjoy.

Power of the Pen: Careers Combining Science and Writing Sonia Bhango, PhD

If you have ever considered the pen to be mightier than the pipette, then the information discussed at the science and writing session at this year's Career Symposium is for you.

The well-attended session provided fellows with many interesting facts and advice on joining the written communication field. The panelists included four science writing experts: Eliene Augenbraun, DO, PhD, President/CEO of ScienCentral, Inc., Heather Fugger, PhD, senior medical writer for Global Medical Writing, Jonathan Gitlin, PhD, contributing science writer for *Ars Technica* and Science Policy Analyst at NHGRI, and Kristen Mueller, PhD, associate editor for *Science* magazine. The panelists have a variety of responsibilities, including writing 90 second news pieces for ABC news (Dr. Augenberger), writing regulatory documents for drug trials (Dr. Fugger), writing about science in layman terms for a science website (Dr. Gitlin), and editing manuscripts for *Science* magazine (Dr. Mueller). While the responsibilities ranged, the common theme that emerged was the panelists' love for communicating science.

What skills should you foster to gain an advantage in this field? The obvious answer is to write. The panelists all agreed in that if you are interested in entering this market, you must PRACTICE WRITING! Whether that means starting a blog, getting a degree in a field such as medical writing, or participating in some of the writing workshops the Office of Intramural Training & Education offers, the goal should be to develop your writing skills. More importantly, as emphasized in many other sessions in the symposium, the panelists stressed the power of networking. Joining groups such as the National Association of Science Writers or LinkedIn allow you to meet and communicate with others in the field. It can also help you find a mentor to assist in developing your career.

One of the advantages of being in the written communications industry is an ideal work/life balance. The panelists pointed out that many in their areas have families and are able to negotiate flexible work schedules including working from home as long as deadlines are met. Additionally, the panelists cited opportunities to learn about science outside their original field, to reach out to the community and to educate the public on science as positive aspects of positions in science communication.

When asked about the negatives of their jobs, the panelists listed things like rejecting manuscripts, making deadlines and the effect of the economy on print media. When the subject of compensation arose, the panelists admitted that salary was not an incentive to enter the field, however, their happiness with their current occupations has been far more rewarding.

So if you sit in lab thinking that the best part of your day is explaining science to someone outside the field or reading papers and learning new subjects while critiquing them, then perhaps you should consider entering the written science communication field and begin to foster the Power of the Pen.

Show Me the Money: Grants Administration

Cindy Chang, PhD

The four panelists for this session all have something in common: leaving their own careers in research to make a broader contribution to science. Both Peter Guthrie, PhD and Edwin Clayton, PhD are Scientific Review Officers (SROs) at the Center for Scientific Review (CSR) at the NIH, while Yung Lie, PhD and Adrienne Wong, PhD work in non-profit organizations, the Damon Runyan Cancer Research Foundation and the Juvenile Diabetes Research Foundation International (JDRF), respectively, where they develop and manage a variety of grant programs.

SROs take great lengths to ensure that every grant proposal gets a fair and thorough review. Dr. Guthrie explains that his role is similar to a referee's in a soccer game: he does not determine the outcome of the game, but supervises and ensures the fairness of the process. When it comes to selecting reviewers for a grant proposal, SROs aim to find good scientists with expertise in the field who also have the ability to recognize a proposal that advances the field. SROs must also ensure that the members of the review panel have a range of scientific expertise and get along well with each other. SROs consider themselves to be "desk" scientists rather than "bench" scientists. By administering a fair and balanced grant review process, they facilitate scientific progress.

Working for a privately funded foundation, on the other hand, involves wearing several hats. Dr. Lie coordinates three different grant programs supporting cancer research: postdoctoral awards, clinical investigator awards, and innovation awards aimed at supporting young investigators. She oversees the committees that select the awardees and serves as a liaison between scientists and the foundation. She also writes up the recent scientific discoveries of the grantees as well as participating in fundraising efforts. Dr. Wong runs several programs in Beta-Cell Replacement including one in multidisciplinary cell therapy and non-invasive imaging. She also works on international collaborations on Type 1 diabetes research with public and private funding agencies. Both Drs. Lie and Wong enjoy the variety of tasks and the opportunities for learning in their jobs. By working for a foundation supporting disease research, they are able to use their scientific background to fulfill their desire to support scientists and to cure disease.

How each of these scientists transitioned into administrative careers varied. Dr. Clayton, trained in psychobiology, first became interested in grants administration at NIH when he met a scientific review officer and learned about the grant review process. He then applied for a CSR internship program offered at the time. Other similar programs are currently offered at the NIH. After four years as a postdoctoral researcher, Dr. Lie realized that she did not want to stay in academia. She learned about working for a non-profit organization through her friend, Dr. Wong, who herself had responded to an advertisement in *Science*. Other good sources for finding jobs in the non-profit sector include *Nature* and *The Chronicles of Philanthropy*.

When asked whether they would return to the bench, the panelists all answered a resounding no. "Most people who leave the bench don't want to go back," explained Dr. Guthrie. Although some grant administrators "do science on the side," they risk conflict of interest and find it difficult to keep up with the pace of science. However, the door to academia is not completely closed when working in grants administration. Dr. Guthrie, who has received many offers for university positions during his tenure, explained: "so few people know about the grants administration" process, and therefore they are considered a great asset in an academic setting.

Teaching for a Living

Jennifer Crawford, PhD

Coming from an academic research background, I had heard teaching described as a chore that robbed time from the more noble pursuit of research. Thus, I was anxious to see how the Teaching for a Living session would be received and was pleasantly surprised to find a packed auditorium. Despite early microphone difficulties, the panelists and audience engaged in a lively discussion of what Reid S. Compton, PhD Senior Lecturer at the University of Maryland, called “the greatest job.”

Members of the panel represented several career tracks in science education. Michael T. Kim, PhD, a Montgomery County high school teacher, was a technician before graduate school and completed a post-doc at NCI-Frederick afterwards, but decided he wanted to work more with people. Rashid Alam, PhD is a professor at Montgomery College where his primary focus is teaching but has mentoring, curriculum development, and committee responsibilities as well. Jenni Punt, VMD, PhD, a professor of Biology at Haverford College, juggles teaching, mentoring students, and an undergraduate research program. Carla Easter, PhD, who completed a post-doc in education, is now a science education specialist at the National Human Genome Research Institute where she assists K-12 teachers with curriculum design. Dr. Compton, a full-time lecturer and Director of the College Park Scholars-Life Sciences program, took a circuitous route from independent, basic researcher to a stint at a scientific journal to his current position of teaching and mentoring undergraduate students.

While the panelists each arrived at a career in science education by a distinct path, all agreed that the best way to get into teaching was to take advantage of teaching opportunities or consider making your own. Dr. Easter suggested volunteering to teach or TA for science instructors. Dr. Kim proposed being a substitute teacher. Dr. Easter also indicated that postdoctoral programs in education might be a way for scientists to transition into educational careers.

Becoming a high school teacher requires the most formal training leading to a teaching certificate, but several incentive programs are available in Maryland through collaborations between local universities and Montgomery County Public Schools (MCPS). According to Dr. Alam, competitive applicants for community college professorships have at least a Master's degree, though a PhD is preferred, and a significant amount of classroom time. In addition to teaching experience, those applying for positions at liberal arts schools will need to develop their own research programs geared toward undergraduates.

When asked whether completing a post-doc was valuable when applying for education positions, Dr. Punt said she felt a post-doc consummates things. Through writing her own papers she could better assist her students, and doing more independent research prepared her for establishing an undergraduate lab. Dr. Kim agreed saying he could better mentor his students on possible career options.



To find teaching positions, the panelists suggested checking the *Chronicle of Higher Education*, specific school websites, and *Science* magazine. During the hiring process for these positions, candidates will often be asked to present a mock lecture to demonstrate their teaching skills. Certain jobs require a specific immigration status. MCPS, for example, only hires US citizens, but private

institutions are usually more flexible.

The most encouraging aspect of the session was the enthusiasm of the panel towards teaching. Dr. Kim called his students “truly a joy” when they understood a concept and noted that he gets more satisfaction from his current position. Several panelists described the rewards of broadening their students’ awareness and appreciation of science and teaching them to think critically. They also admitted to feeling drained after giving their all for the students; a price they pay willingly. Could your life benefit from some impassioned exhaustion?

To Market We Go: The Process of Patent and Technology Transfer Sandeep Dayal, PhD

Are you strongly affected by the latest landmark legal decision in the news? Are you shocked to see an academic scientist publish a hot paper without protecting the intellectual property within? If so, a career in patent law or technology transfer might be right for you.

A spectrum of career options was represented by members of the panel “To Market We Go: The Process of Patent and Technology Transfer”. Cindy Lang, PhD, Technology Licensing Officer at Columbia University, shepherds inventions through the patent process, serving as an interface between academic scientists, industry, and government agencies. Jonathan Sparks, JD, PhD, Patent Attorney with Edwards, Angell, Palmer & Dodge, LLP in Boston, initially translated science to legal professionals but has shifted to a more strategic role in portfolio planning. As an Associate Patent Agent at MedImmune, Miklos Gaszner, PhD finds creative ways to protect products, intellectual property, and investments. Samira Jean-Louis, PhD, Patent Examiner at the US Patent and Trademark Office (USPTO), protects the public and marketplace by ensuring novelty and proper scope by reviewing patent applications.

What can a bench scientist or clinician do to help land a first job in this new field? The panelists made some general suggestions: gain some tech transfer experience, show diversity and versatility in your knowledge base, and network with people already in jobs of interest. More specifically, Dr. Lang proposed gaining business experience or joining a part-time internship program. Tech transfer or related coursework would show determination according to Dr. Jean-Louis. Dr. Sparks recommended volunteer work in a tech transfer office. Any efforts to show seriousness and passion for tech transfer would make an interested scientist more attractive to employers.

Is additional training required? The only absolute requirement is a scientific background. All the panelists were trained by their organizations, for example Dr. Jean-Louis graduated from the structured Patent Training Academy program at the USPTO. However, Dr. Sparks (who has a law degree) and Dr. Gaszner (currently in law school) described a “glass ceiling” for advancement without a law degree in certain career tracks. Patent agents, in contrast, do not need a law degree. They typically have lucrative careers but do not have all of the rights, responsibilities, and privileges given to attorneys.

A variety of lifestyles and compensation packages accompany different types of jobs in tech transfer/patent law. As a patent attorney at a large law firm, Dr. Sparks has an intense and stressful work schedule best suited to someone with a driven personality. Dr. Gaszner admitted that balancing work and family life is challenging, albeit temporary, while he works full-time and attends law school. Dr. Lang described a fairly normal business schedule, and Dr. Jean-Louis enjoys an independent and flexible schedule at the USPTO. In addition, she noted that many patent examiners spend a few years at the USPTO and then transition to other types of organizations such as non-profits or congressional assignments. One limitation of the USPTO is that they only employ U.S. citizens, unlike other tech transfer positions.

It was clear that the panelists use their scientific training every day and find their careers rewarding. These examples illustrate the variety of career options available in tech transfer, but identifying the right job is essential for satisfying professional and lifestyle needs. If you find yourself staring at a potentially commercial piece of data or innovation, and planning a strategy to protect this intellectual property, perhaps you should explore a career in tech transfer or patent law.

CAREER SKILLS AND ADVICE

Around the World with Your PhD: International Opportunities

Senta Kapnick

Have a love for travel and exciting adventures abroad? In the International Opportunities panel, each panelist's individual background gave the audience a glimpse of opportunities that offer the possibility of combining science and international relations and insights into the differences between funding and facilities overseas.

When searching for a position overseas, networking was, not surprisingly, at the top of the essentials list. Dora Fitzli, PhD, a Counselor for Science and Technology at the Swiss Embassy, informed us that approximately 50% of post-docs in Switzerland are international students and that there are currently Swiss National Science Foundation exchange fellowships available. Conveniently, the programs are all in English. Additionally, she alluded to the availability of European Union grants and country-to-country collaboration efforts. If you are still a graduate (or even undergraduate) student and have an interest in transitioning from bench work to government, public relations, and/or science education, the Think Swiss Research Scholarship Program offers opportunities to conduct research abroad in fields including climate change, public transport, and finance in addition to the life sciences. There is, of course, the Fulbright Scholarship, which was mentioned briefly by scholar Leonardo Marino-Ramirez, PhD, a bioinformatics investigator for the Colombian Corporation for Agricultural Research.

The availability of funding to U.S. citizens abroad and foreigners going home is a critical issue. According to Dr. Marino-Ramirez, much of the money for international research comes from the local government, with corporations as small contributors. The panelists confirmed that grants are becoming more competitive and creativity essential, on the domestic and international levels. Nonetheless, there are still apparently plenty of unrestricted funding sources bound to institutions and not citizenship.

Worried about whether or not there will be access to state-of-the-art equipment? The answer depends heavily on the location. As Dr. Marino-Ramirez remarked about international work, particularly in Columbia, "you have to be prepared to build things from the ground up."

An additional opportunity to work internationally on a collaborative level also exists via positions in non-profit organizations. Duties in this environment can include bench work and grant writing on the domestic level. For MDs and clinical epidemiologists, travel to clinical trial sites overseas is a very real possibility. Kamalakannan Velmurugan, PhD, a scientist at the Aeras Global TB



Vaccine Foundation, highlighted a few benefits of working for non-profits. First, it can be easier for non-profits than it is for industry to take on foreign post-docs, as visas can be directly transferred in most cases. Second, funding can be better at established non-profits due to a surge in charity organizations and the presence of funding giants such as the Bill and Melinda Gates Foundation, which funds a considerable portion of Aeras' vaccine development efforts. Don't have industry experience? Dr. Velmurugan assured the audience that in the basic science department of many non-profits, this is not a problem.

As appealing as international work can appear, there are difficulties to overcome. Dr. Fitzli confessed that establishing a new professional identity during a career transition can be very difficult, and is even more pronounced when you are between fields in an unfamiliar culture. The take home message: with good networking skills and an open mind, the world beyond the U.S. job market for scientific professionals is substantial.

Career Options for Physician-Scientists

Sid Kerkar, MD

“Follow what you notice, follow what you see, but you don’t always have to follow the path you thought you’d be.” Steve Holland MD, Chief, Laboratory of Clinical Infectious Diseases, NIAID.

The NIH career symposium for clinicians provided a glimpse into the wide range of choices available to physician scientists after training. While paths such as academia, industry, and the private sector can lead to fulfilling careers, the choice of what direction to take can be difficult. The five panelists, Steve Emerson, MD, PhD, President of Haverford College and former Chief of Hematology/Oncology at the University of Pennsylvania, Philip Coyne, Jr., MD, US Public Health Service, Department of Preventive Medicine, Jeffrey Siegel, MD, Clinical Team Leader, Food & Drug Administration, John Wagner, MD, PhD Vice President, Clinical Pharmacology, Merck & Co., Inc, and Dr. Holland, provided intriguing insight by recalling their unique career paths.

Dr. Holland completed his clinical training in Infectious Disease at Johns Hopkins University, but his curiosity into the burgeoning field of molecular biology led him to work on the transcriptional regulation of HIV as an NIH fellow. He decided to stay at the Intramural Branch at NIH, allowing him the opportunity to work on complex biological pathways while still caring for patients on a busy Infectious Disease service. Similarly, Dr. Emerson commented on the benefits of using patients and their diseases as a basis for discovering new science. He pioneered ways of isolating and growing human hematopoietic stem cells *in vitro* using bioreactors. Later in his career, Dr. Emerson was able to combine his scientific and clinical background as Chief of Hematology/Oncology at the University of Pennsylvania and helped organize a department where the research interests were aligned with clinical efforts.

Dr. Coyne continued with the central theme of serendipity as an important factor for physician scientists and emphasized the importance of remaining open to possibilities. Dr. Coyne worked in the Peace Corps prior to completing medical school and clinical training in infectious disease at the Uniformed Health Services. Afterwards, he joined the Food and Drug Administration (FDA) as a clinical reviewer and continued on to the Public Health Service.

Dr. Siegel, a current clinical team leader in Rheumatology, provided further information about the FDA. After clinical training in Internal Medicine and scientific training in autoimmune diseases at NIH, Dr. Siegel started his career working at the Naval Medical Research Institute focused on basic research. He later transitioned to the FDA as a medical officer, which allowed him to use both his scientific and clinical backgrounds to impact public health.

The final panelist for the session was Dr. Wagner, and he too mentioned the importance of providence in his path to becoming the Vice President of Clinical Pharmacology at Merck & Co. After completing both graduate and medical school, Dr. Wagner became enamored with the importance of translational research. He studied gene therapy for cystic fibrosis as a post doctoral fellow, and later joined the scientific department of a large pharmaceutical company.

In conclusion, the successful careers of the various panelists demonstrated that physician scientists play an important role in all areas of scientific advancement, including academia, regulatory agencies, industry, and the private sector. The central force shaping many of their careers was being open to opportunities as they arose. The combined expertise of individuals with a background in medicine and research can truly shape the field of translational medicine and lead to important advances in global health and drug discovery.

Catching the Translational Wave

Chanelle Case

The biggest misconception of “Catching the Translation Wave” is that medical education is necessary to pursue this field of research. Doctoral training is dedicated to teaching one how to think critically, and that skill is exactly what translational medicine requires. Translational research is a team project, with each member fulfilling a role essential to the team’s function as a whole. Each of the panelists started working in the translational field by relying on his or her training and quickly adapting to this new environment.

In all cases, the panelists sought out an opening in the field, and used what training and skills they had to fill that void. Elaine Jacobson, PhD was a biochemist interested in NAD metabolism who went on to become a consultant to a pharmaceutical company and eventually started her own biotechnology company. Jennifer Adair, PhD, a former NIH post-doc trained in human genetics and cell biology, created an opportunity as a clinical trial research coordinator at the Fred Hutchinson Cancer Center through networking and her experience in the clinical research courses offered here at NIH. Rick Meeker, PhD began his career in neuropharmacology at the University of Chapel Hill, but quickly began seeing the clinical applications for his work in CNS disorders, given their relationship with diseases such as HIV.

When considering a career in translational research, the panelists recommended beginning your training in a program that has translational aspects. During this time, it is important to establish collaborations and good relationships with the people you encounter; a career in clinical research can be isolating because you may often be the only PhD on the team. The NIH is responsible for a large portion of clinical studies, so while at NIH capitalize on opportunities for learning about the structure and funding of these research programs.

When beginning the job search, know your strengths, be creative, and find a niche in which you can thrive. Do not be swayed by job titles, because more often than not, companies and institutions will create titles for the positions that they need filled, regardless of what is listed. To ensure job security, look for opportunities in programs in which the institution or company is dedicated to establishing clinical and translational research. Be aware of what is required to attain tenure or a permanent faculty position, and what that will mean in terms of sustaining your salary. Some institutions expect researchers to bring in their own funding, so know the origin of the money being used for research.

The translational field is growing and requires expertise from all areas of research in order to achieve success. PhD-level training is unique in this field and can be instrumental to its progress. Don’t be intimidated by the magnitude or requirements of this “wave”, but rather be led by the desire to make a difference and direct the path of this exciting field of research.

Falling Down and Getting Back Up: Dealing with Setbacks

Tonia Carter, PhD

“Let me tell you the secret that has led me to my goal. My strength lies solely in my tenacity.” – Louis Pasteur (1822-1895). Numerous setbacks plague our lives as fellows including failed experiments, bureaucracy, an incorrect hypothesis, a rejected manuscript, uncertainty about the future, and too little or too much mentor involvement in our research. When the time comes to find that next position, additional stressors abound such as visa problems, where and how to begin a job search, making time for a job search while completing current research commitments, and the insecurity of wondering whether our qualifications are satisfactory for the type of positions available. What kind of attitude should be adopted when managing these obstacles?

Denise Saunders, PhD, counseling psychologist in the Office of Intramural Training & Education, suggested that people usually approach problems with one of two mind-sets: pessimism or optimism. Pessimism leads to the beliefs that a problem is permanent and that the cause is internal. Thus, a pessimist labels himself a failure when things go wrong. In contrast, when viewed with optimism, a setback is seen as a temporary, isolated event with external causes leaving the optimist’s self-image intact. Optimism is not the solution to every problem, but practicing flexible optimism allows for its wise use. When faced with an obstacle, the risks involved should be assessed and pessimism applied when the risk is highly unfavorable or could lead to harm. That is, pessimism can be a healthy way to protect ourselves. Optimism should be used when dealing with low risk outcomes or with problems that have a fair chance of success.



Dr. Saunders mentioned resilience as a skill that can help maintain an optimistic attitude. One well-known example of this principle occurs when teaching children to ride a bicycle. When they fall off, their parents tell them to brush themselves off, to get back on, and to keep trying. Applying resilience to setbacks at work or at home will lead to an improved attitude and ability to succeed. How can resilience be fostered? First start by accepting that setbacks are a normal part of life. Try to establish connections with others and keep things in perspective. Look for opportunities to achieve goals, take time to appreciate all the good things in life, and strive to maintain a hopeful outlook even in difficult situations. Other steps to developing a more positive outlook include recognizing and eliminating negative thoughts, developing an awareness of beliefs about ourselves and the world, not punishing ourselves for mistakes and weaknesses, and taking time to laugh and enjoy life. Optimism is a learned practice just like being hard on ourselves is.

Dr. Saunders suggested three exercises that can enhance an optimistic attitude. One is to write a letter of gratitude to someone who has been especially kind but was never properly thanked and then to deliver the letter in person. Another is to write down three things that go well each day. The third is to identify your five greatest strengths in a survey at www.authentichappiness.org and to use them more often, in new and different ways. Recommended books on optimism include “Learned Optimism: How to change your mind and your life” and “Authentic Happiness: using positive psychology to realize your potential for lasting fulfillment” both by Martin Seligman, PhD. Websites on this topic include www.positivepsychology.org and www.ppc.sas.upenn.edu. A Japanese proverb states “Fall seven times, stand up eight.” By practicing learned optimism and developing our resilience, we can increase our chances of standing back up after a fall.

Confusion. Excitement. Worry. Anticipation. Confidence. Disappointment. An incredible range of emotions haunts scientists as they near the end of their training. Be it doctoral work coming to a finale, a fellowship about to expire, or a post-doc nearing the end of his or her time, we must all embark upon a common journey: the job search. Some people spend years mulling over their next move; others have an amazing opportunity handed to them, to the envy of all. Regardless, it is good to know some skills and resources to ease the burden of this common path. Office of Intramural Training & Education (OITE) career counselor Melanie Sinche, NCC shared her wisdom and knowledge about searching for a job. Two critical themes emerged from her presentation: flexibility and networking.

Flexibility is not an optional quality and must be applied in many different ways. For instance, being flexible by using a variety of job-searching strategies is important. It is not good enough to consider only advertised jobs since there are a surprising number of unlisted jobs at institutions. Oftentimes, there are several open positions that are routinely and quickly filled, thus they are not posted. In other instances, jobs are not yet listed because institutions are merely waiting for funds to be released. In fact, it is estimated that 75-80% of today's available jobs are not publicly posted.

The plentitude of unlisted jobs highlights the importance of a good support network. Friends, colleagues, and the staff of the OITE offer a convenient avenue for encouragement, brainstorming about jobs, and sharing job postings of interest. In today's society, networks can also be easily formed and maintained through email, online communities such as www.meetup.com or www.linkedin.com, and via professional associations. Still, if a potential employer or colleague can meet you in person, at a conference for example, you will distinguish yourself from a myriad of other faceless applicants.

Where should a search begin? Simply put, it depends upon your interests. You may want to search a university's website for a particular job because you like the organization's focus or philosophy. This method can be enhanced by contacting relevant faculty at these institutions, and periodically "checking in" to see if jobs are available, thus keeping your name fresh in their memories. If you wish to peruse jobs of a certain type, you can look at job listings in journals and on more general science job websites. Perhaps you are still uncertain about the kind of job you would like to pursue. In this case, the best place to start may be at the OITE. The career counselors can help with this decision by conducting a personality and career assessment for you. It is best to know what jobs are compatible with your unique set of character traits before you begin your search.

Once you decide, you may want to consider volunteering in a field of interest—teaching, new research areas, or in clinical settings, for example. You might also consider looking for professional fellowships or internships geared towards gaining experience in a new arena. Finally, get organized and set short-term goals. Perhaps you should commit to contacting five different universities this week or begin building a network with colleagues in the lab. Short-term, achievable goals will help you move forward and stay focused in your career search.

Don't let the stressful emotions of a job search overwhelm you. By knowing yourself, networking, and remaining flexible, you will succeed in finding a good, compatible job.

Managing Up

Heidi Schambra

How would you handle a wild driver coming up behind you in the road? How would you handle your boss telling you she can't meet with you now to discuss an issue of vital importance to you? The answers come from dissecting the conflict.

Kevin Jessar, JD, PhD Deputy Ombudsman for the NIH, is no stranger to conflict management in science. Citing a study of laboratory dynamics, he pointed out that over 75% of scientists reported spending 10-25% of their time on 'people problems.' Conflicts become even more perilous when they involve a supervisor, where harming a relationship may have long-term consequences on one's career.

Dr. Jessar covered two common mistakes made by those in conflict: using an unproductive conflict resolution style and arguing one's position rather than one's interest. He then offered techniques to help obtain a mutually beneficial resolution. "When you encounter conflict," Dr. Jessar advised, "you need to consider both the goals of each party and the importance of the relationships involved. This will determine the strategy you will use to resolve it." With the wild driver in the example above, there is no relationship and the goal is to get home safely. Thus, avoidance is the best strategy. With the unavailable boss, the relationship is important to preserve, but the goals are equally important to achieve. Because both are at stake, collaboration is necessary.

To address the second common mistake, distinguish between people's positions and interests. A position is a person's view or preferred solution, whereas an interest is a person's underlying need or concern. As an example, Dr. Jessar used John, the messy colleague who chronically leaves the laboratory in disarray. A position is that John is inconsiderate and should be reprimanded by the supervisor. An interest is that a clean workplace is necessary for the safety and productivity of all lab members.

Before asserting demands in a conflict, Dr. Jessar urged three points: "consider what you are requesting, what the other person is requesting, and what interests lie behind each request." By gently asking questions, one can unmask the other person's interests. Dr. Jessar cautioned against closed or leading questions, such as "what did you do that for? Don't you think that's a mistake?" These can create a negative tone and make the other person defensive. Instead, one should use open-ended questions, which convey genuine interest and willingness to understand, such as "how do you feel about ... ? Can you tell me more about ... ?" The underlying interests are discussed, and a constructive dialogue begun.

The next step in the discussion is to reframe the problem. Focus on the interests at hand, not a particular position. Dr. Jessar gave an example. "The initial frame would be, 'let's talk about John hogging all the reagents.' The reframe would be, 'Let's talk about how we can ensure the lab does not run low on reagents and that we are all making the best and fair use of them.'" In reframing the question and focusing on interests, Dr. Jessar said, "you are soft on the people, and hard on the problem."

What if careful consideration of the conflict resolution style and interest-centered discussions don't work? Dr. Jessar and the Department of the Ombudsman are here to help. The agency is independent of the management structure of the NIH, and is, therefore, a confidential resource for advice. If so desired, the Ombudsman serves as a neutral mediator to help resolve conflict between parties.

Negotiating Outcomes

Diana Ma, PhD

Two sisters are playing in their backyard when a truck rolls by carrying oranges. A single orange bounces off the truck, over to the two girls. How can these two sisters best divide the orange? Most of the solutions to the “orange problem” offered by the participants of the principles of negotiation session revolved around dividing the orange equally between the two sisters. However, with the added information that one sister wanted the orange for its juice while the other sister wanted the orange for the zest of its peel, alternate solutions to the orange conundrum became apparent.

The message is that it may be possible to find common ground where both parties benefit if you understand what the other party wishes to achieve and why. Parties in negotiation may choose various strategies, including accommodation, compromise, avoidance, contention, or collaboration, depending on the value the parties place on their mutual relationship and the outcome of the negotiation.

When entering negotiations, it is important to first determine your own objectives. Understand that the other party has distinct interests and may view the situation from a different perspective (e.g. different culture or experiences). Also, know what your “deal breakers” are as well as areas where you can be flexible. Realize that the other party has similar boundaries. Negotiations are usually most successful when the parties establish ground rules and expectations. Negotiations should include a discussion of options and alternatives. This is the time to make offers and concessions. Agree on standards for the evaluation of possible options for resolution and confirm that both parties have the authority to negotiate. Allow time to vent before and during negotiations. Finally, evaluate the agreements based on the predetermined criteria and implement the plan.



This session was run by Nicholas Diehl, MS and Samantha Levine-Finley, MS of the Office of the Ombudsman for the NIH, which offers confidential conflict resolution services to anyone who works at NIH. You can contact them at (301) 594-7231 or get more information by visiting <http://ombudsman.nih.gov/>.

People Management

Claudia Gebert, PhD

Do you think people who manage others dress in black suits, commanding orders from behind their desks? The People Management workshop presented by Joan R. Goldberg, Executive Director of the American Society for Cell Biology, made it clear that managing people is not about directing supervisees from behind a desk, but walking the fine line between being a boss, a mentor, and a friend. Even if you do not feel like a manager, you probably have been in this position at one time or another (e.g. by supervising a technician or student in the lab). If you have not, but your goal is to one day run your own lab, then sooner or later you will find yourself in the position of managing personnel.

Managers are leaders who guide a team of individuals toward accomplishing a goal or task. In this way, managers remove barriers to create an environment accommodating the diverse personalities of team members. Only when each individual member has the opportunity to flourish and perform his or her best, will a team be able to succeed. The main objective of a manager is to nurture the individuals, however, the team as a whole has to be the focus of all efforts.

The most important skills for managers are vision, motivation, and emotional intelligence. Specifically defining the group's vision or mission will help the team look ahead and establish goals that are worth achieving. On the way to each goal, the team members have to be motivated to maintain and enjoy their performance. Motivating individual personalities requires fine-tuning of the manager's personality with all of the supervisees' multifaceted personalities, and applying emotional intelligence.

Emotional intelligence has been defined as "the subset of social intelligence that involves the ability to monitor one's own and others' feelings and emotions, to discriminate among them, and to use this information to guide one's thinking and actions" (Salovey and Mayer 1990: *Imagination, Cognition, and Personality* 9, 185-211.) For a manager, this means determining which team members need to be rewarded and which need to be pressured to perform at his or her best. A manager has to notice the strength and weaknesses of each team member and act accordingly in order to improve the performance of the individual, and the team as a whole. Managers are free to determine how such an idealistic team environment is achieved. It can be as easy as celebrating birthdays or the achievement of a personal goal of one of the team members or it can be as challenging as supporting a team member going through cancer treatment.

Managers are the spirit of a team. If you are thinking about becoming a leader, consider acquiring some people management skills ahead of time. These skills can be learned, not behind a desk, but by interacting with others, by working in teams, and by learning in workshops such as the one presented at this year's NIH Career Symposium.

US Job Interview Skills for International Trainees

Vaibhav Saini, PhD

White socks, belching, body odor, and even flatulence were mentioned (or implied) by Julie Gold, MA, MSW, LGSW, Leadership and Professional Development Coach in the Office of Intramural Training & Education (OITE), in her humorous presentation on skills to help international trainees ace a job interview in the U.S.

Interviews can cause panic and intermittent insomnia in even the most experienced candidates. For international trainees, it can be especially daunting to juggle language and cultural issues in addition to the expected professional questions. Ms. Gold's presentation provided tips on making it through any interview with poise.

First impressions are crucial to the success of an interview. Always be punctual and dress in professional attire. Unmatched socks or white socks with a dark suit can thwart your efforts. Americans are also sensitive to odors. This can be easily remedied by wearing deodorant. However, avoid colognes and perfumes since the interviewer could be allergic to that perfume or the smell may trigger unpleasant memories of another person who wore the same cologne.



A firm (but not *Terminator*-firm) handshake is a great way to begin the interview. Follow it with small talk about subjects such as the weather. If the interviewer asks if you are doing well, then answer a polite yes. Be sure to lookup information about the interviewer on the company website. These tidbits of information will help fill any awkward silences during the conversation. Listen carefully to the interviewer, and answer the question he or she is asking, not the one for which you prepared. If you wish to disagree, then do so politely. It is a good idea to avoid a war-of-words with the interviewer. As Ms. Gold put it, "You may win the argument, but you will lose the interview."

During the interview sell your strengths, highlight your achievements, and demonstrate how you will fit in the vision of the company. Refrain from enquiring about the exact salary, vacation, or other benefits. Most importantly, when concluding the meeting, if the interviewer gives you an opportunity to ask questions, take advantage of the offer. Ask pertinent questions which will demonstrate your interest in the position and the company. Ask for the interviewer's business card and thank him or her for meeting with you.

If the interview is followed by a lunch, order a mid-priced dish and avoid ordering a stronger drink than the interviewer. Also, please refrain from burping, slurping, double dipping, and chewing noisily as Americans consider this rude. However, if you should slip, simply say a polite excuse me.

For more information about interview skills, preparing resumes, and practicing mock interviews, make an appointment with an OITE career counselor by writing to Kathryn Foisie at foisiek@mail.nih.gov. Julie Gold can be contacted at goldje@mail.nih.gov.

The Modern Day Scientist's Guide to Balancing Work and Life

Samantha Crowe, PhD

If the phrase “soaking up rays,” conjures up nightmares of lost safety goggles and burned corneas, your work-life balance may be teetering perilously. Most recognize the risks of such imbalance, but given the extraordinary productivity demands and fierce competition in science, it is easy to feel a lack of control over the situation. However, Brianna Blaser, PhD, Project Director of the Outreach Program for AAAS/Science Careers, contends that a balance between personal and professional demands is attainable.

Balancing work and life in science, where your career's most demanding years tend to coincide with multiplying personal obligations, has become increasingly difficult. Dr. Blaser stressed that historically, scientists were men with stay-at-home wives, able to meet their research demands while their spouses managed the home, or they were individuals so immersed in their research that the line between their work and life blurred considerably. This established a culture in science that precluded an existence away from the bench. Fast forward to current times in which funding and hiring issues abound, where the scientific mantra has become “publish-or-perish”, and the obstacles to achieving balance can seem insurmountable.

Do not despair. As Dr. Blaser suggested, the work-life scale can be tweaked. She recommended assessing professional and personal needs before choosing a work environment. Ask potential employers about their policies. Do they allow time for child- and eldercare? Do they have a tenure clock freeze policy, and how is it actually implemented? Importantly, speak with others at the institution to see what support mechanisms are available and which are effective. Finally, after receiving a job offer, be clear about your needs upfront and early, and negotiate for yourself to minimize future surprises.

Work-life balance can also be realized by working smarter not harder. In science, it is often assumed that time management is learned implicitly during graduate and postdoctoral work. To some extent, this is true; finishing a dissertation without multitasking and prioritizing responsibilities would be difficult, if not impossible. Still, there are significant benefits to learning new time management strategies and re-evaluating old ones. For example, establish priorities, set goals, and make timelines, advised Dr. Blaser. She suggested making to-do lists detailing tasks with deadlines, long-term projects, re-occurring events, and other activities such as reading and career development. To prioritize tasks, divide them into categories such as urgent/not-urgent and important/not important, and accordingly, minimize interruptions like non-urgent emails and phone calls. Dr. Blaser pointed out that to fully achieve balance, these strategies need to be applied at home as well. Know where your time is going and ensure it is spent under your direction.

Finally, Dr. Blaser proposed that communicating with co-workers, supervisors, family, and friends is key to meeting career demands while maintaining an existence apart from work. This allows you to not only delegate tasks at work but to do so at home where tasks such as cleaning, cooking, and running errands can be outsourced. Communication is also critical for setting clear expectations about what is required of you and what you will require from others, eliminating misperceptions that can cause conflict.

Dr. Blaser's advice reminds us that high levels of productivity do not necessarily mean high levels of satisfaction. Sacrifice and hard work pay off only if you also nurture your health, happiness, and a well-balanced life. If you find yourself saying, “I'm going home,” to indicate a return to your desk, it is time to think about finding a better balance.