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CCR Fellows & Young Investigators



*Spring blossoms near NCI Shady Grove
(credit: Claire McCarthy)*

Springing forward with FYI!

*From the Editor-in-
Chief's Desktop*

Claire E. McCarthy

We hope everyone is enjoying the cherry blossoms and warmer weather! Now that the hours of daylight are getting longer, take a few minutes to read the Spring edition of the FYI newsletter!

In this issue, the Women in Chemistry group of the CCR Chemical Biology Laboratory continues the “History of Women in Sciences” series about women who were awarded a Nobel Prize. Continuing the theme of women in research, Alida Palmisano discusses the Sallie Rosen Kaplan (SRK) Fellowship that provides mentoring and career development opportunities for female postdocs at NCI.

For those of you trying to determine what scientific career path would suit your strengths and interests, this newsletter has interviews with scientists working in science communication and at a pharmaceutical company. You can read Manasi Apte’s conversation with Dr. Maryam Zaringhalam, an AAAS Science and Technology Policy Fellow who is a producer for “Story Collider” and co-hosts the “Science Soapbox” podcast. If you want to learn more about a day-in-the-life of a researcher in industry, check out the article by Naz Sarwat about Dr. Barbara Rath’s experiences as a Senior Scientist at Merck.

Along with learning about scientific career options, it’s also important to make professional connections. Molly Congdon gives helpful tips on how to start networking and ways to maintain networking relationships. At the end of the issue, you can find information about getting involved with the FYI Steering Committee, upcoming social activities, and more.

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History of Women in Science – Nobel Laureates (Part 3)

By Dorothy Butler, Molly D. Congdon, Kellie Nance

Introduction

In the third edition of the Women in Science: Nobel Laureates series, we continue to highlight the careers and contributions of women who helped shape their scientific fields. These women overcame cultural expectations as well as religious and gender bias. Through their independence and creativity, they blazed their own unique paths to scientific greatness.

2018 – Frances H. Arnold

Direct evolution of enzymes



Frances H. Arnold
(credit: Nobel Media AB 2019/Alexander Mahmoud)

This past year, for only the fifth time since its inception, the Nobel Prize for Chemistry has been presented

to a groundbreaking female scientist. The daughter of a nuclear physicist, Frances H. Arnold was born in 1956. She grew up outside Pittsburgh, PA during trying times in United States history. During her teens, she was fiercely independent and lived on her own throughout high school. She was able to finance her rent by driving a cab and lying about her age so that she could work as a cocktail waitress at the local jazz club. She also became an activist and stood up for her beliefs. When she was only 15 years old, she hitchhiked from her home in Pennsylvania all the way to Washington, D.C. to protest the Vietnam War.

After high school, Frances enrolled at Princeton University to study mechanical and aerospace engineering, reportedly because the department had the fewest academic requirements for a degree in engineering. Looking back, Frances described herself as a “worse than mediocre” student. After her sophomore year, she took

a year off to explore Italy. During this time, she worked in an Italian factory that made parts for nuclear reactors. Upon returning from Italy to complete her degree, she joined a group of engineers at the Center for Energy and Environmental Studies, worked on sustainable energy problems and considered obtaining an advanced degree in international affairs. Finally, in 1979 Frances received her B.S. degree from Princeton University.

Upon graduation, Frances simultaneously pursued her love of adventure and engineering by working in Brazil, South Korea, and at the Solar Energy Research Institute in Colorado, where she designed solar energy facilities for isolated areas. Frances returned to the academic world to pursue an advanced degree in chemical engineering at the University of California, Berkeley. Her graduate work, under the tutelage of Dr. Harvey Warren Blanch, focused on developing affinity chromatography techniques and led to the granting of her Ph.D. in 1985. It was during her graduate career that Frances found her love of biochemistry.

After earning her Ph.D., she moved to the California Institute of Technology and worked for Dr. Ignacio Tinoco Jr. from 1985-86 as

a postdoc investigating structural properties of mismatched DNA oligonucleotide duplexes. What may surprise many young scientists today, is that since moving to Caltech, Dr. Frances Arnold has never left. In 1987, she was appointed as an associate professor and, to this day, continues to cultivate and expand her research interests in the same labs that she started in.

Her original research focused on “rationally” designing enzymes from basic amino acid building blocks and involved a brute force approach; however, very few useful mutated proteins were produced. In her mind the problem was that despite our ability to read, edit and synthesize DNA, scientists do not know how to write in proper DNA “language”, which prohibited us from easily and efficiently manufacturing new enzymes. “All you have to do is look at antibiotic resistance to understand how quickly biology can adapt.” She found inspiration in not only the enzymes, but the process that nature uses to create them: evolution. In her words, “It is a remarkable, diversity generating machine.”

Her attempts to harness the power of nature led to her process

of directed evolution. In short, random mistakes are introduced into genetic code through a copying enzyme or by recombining DNA from different species. These mutated genes are inserted into bacteria that produce the proteins encoded by the mutated DNA. Selection experiments are run to identify proteins with desirable properties. Once desirable proteins are found, the DNA is extracted and the process is repeated for multiple protein generations until a protein with the desired properties and functionality is isolated. Her approach, “Darwinian” in process, is both elegant and relatively straightforward, speeding up the process of evolution to the laboratory timescale. “I propose a toast to evolution – may we use it well”, Dr. Arnold stated in her Nobel acceptance speech.

Dr. Arnold’s life and career has been full of bold moves and adventures. Originally a mechanical engineer, she successfully transformed herself into a chemical engineer and later a biological engineer. Although her lab studies basic science, she still thinks like an engineer and focuses on big picture, real-world applications. She believes that her unique background enabled her to

look at biological challenges “with a totally fresh set of eyes”. “Learning new things has always been fun for me. Changing fields has been fun and I still feel that way many years later.”

Throughout her career, Dr. Arnold has been the recipient of numerous awards and recognition: National Academy of Engineering (2000), FASEB Excellence in Science Award (2007), National Academy of Sciences (2008), American Academy of Arts and Sciences (2011), National Medal of Technology and Innovation (2011), National Inventors Hall of Fame (2014), Millennium Technology Prize (2016), and the Nobel Prize in Chemistry (2018). In 2005, she co-founded Gevo Inc., a company focused on developing renewable chemicals and advanced biofuels. Dr. Arnold is currently a Linus Pauling Professor of Chemical Engineering, and Biochemistry and Bioengineering Director in the Donna and Benjamin M. Rosen Bioengineering Center, a Division of Chemistry and Chemical Engineering at the California Institute of Technology.

When looking to the future, Dr. Arnold believes “we need science, and we need the smartest minds.” As she stated in a Caltech

press conference upon receiving the Nobel Prize, diversity in gender and ethnicity, “it’s just such a rich resource,” she said. “And as long as we encourage everyone — it doesn’t matter the color, gender; everyone who wants to do science, we encourage them to do it — we are going to see Nobel Prizes coming from all these different groups. Women will be very successful.”

“And as long as we encourage everyone — it doesn’t matter the color, gender; everyone who wants to do science, we encourage them to do it — we are going to see Nobel Prizes coming from all these different groups.”

2004 – Linda B. Buck

Discoveries of odorant receptors and the organization of the olfactory system



Linda B. Buck
(credit: The Nobel Foundation)

Linda B. Buck was awarded the 2004 Nobel prize in Physiology or Medicine, alongside Dr. Richard

Axel, for their discoveries of odorant receptors and the organization of the olfactory system. Their work in this area fundamentally changed how the scientific community understands the sense of smell and has paved the way for numerous advances in the field.

Linda was born in 1947 in Seattle, Washington, the second of three daughters. With an electrical engineer father and homemaker mother, she was encouraged to explore all curiosities as a child, from learning to use power tools to sewing dresses for her dolls. Her mother spent much of her free time solving word puzzles and imparted to her daughter the importance of critical and independent thinking, encouraging her to do whatever she wanted with her life.

After receiving an undergraduate degree in psychology from the University of Washington, Linda considered several career choices, but none seemed to suit the life she had envisioned for herself. After taking time to travel, Linda found her true calling as a biologist after taking a course in immunology, a field she found immediately fascinating.

Soon after, Linda embarked on the journey of graduate school, joining the Microbiology department at the University of Texas Medical Center. Her work was focused on describing antigen receptors of subsets of B lymphocytes. It was during this time that Linda began to think of biology in terms of molecules and how these molecules interact to produce the mechanisms that underlie biological systems.

After defending her thesis, Linda began postdoctoral work at Columbia University under the tutelage of Dr. Benvenuto Pernis, continuing her exploration of B lymphocyte biology. However, she soon found that in order to effectively study molecular mechanisms, she first needed to develop a skillset in modern molecular biology techniques. After finishing her work in the Pernis lab, she moved to the lab of Dr. Richard Axel and began her first foray into neuroscience. In this lab, Linda learned numerous techniques that she employed to understand how genes are differentially expressed in the neurons of sea snails and how this differential expression can be used to identify neuronal populations.

In 1985, Linda read a paper from the lab of Dr. Sol Snyder that she describes as life changing. In this paper, the Snyder group discusses the potential mechanisms that underlie odor detection. Linda was intrigued at once. How can humans and other mammals sense the difference in over 10,000 different chemicals, many of which are nearly structurally identical? Applying her new skill set, Linda began looking for the elusive olfactory receptor family. Knowing that these receptors likely bore some resemblance to G-protein coupled receptors, Linda uncovered a multigene family that encoded over one-hundred different olfactory receptors, a family with unprecedented size and diversity. No wonder mammals can detect such an enormous range of distinct scents!

After publishing this groundbreaking work in 1991, Linda left the Axel lab to become an assistant professor of Neurobiology at Harvard Medical School. In her independent career, Linda and her students discovered how odorant receptors are organized in the nose and mapped how these receptors

relay information to the olfactory bulb. The lab discovered that each olfactory sensory neuron expresses only a single odorant receptor gene, and that these neurons cluster to provide information to the olfactory cortex. Her lab continues to explore the mechanisms of scent perception, particularly pheromone perception and the effect these chemicals have on behavior.

Looking back, Linda feels fortunate to have spent her life doing work that she loves. She credits her amazing mentors, colleges, and students with her success. She also hopes that by winning a Nobel Prize, she has sent a message to young women around the world that, “doors are open to them and that they should follow their dreams.”

*“As a woman in science,
I sincerely hope that my receiving
a Nobel Prize will send a
message to young women
everywhere that the doors are
open to them and that they should
follow their dreams.”*

1986 – Rita Levi-Montalcini

Discoveries of growth factors



Rita Levi-Montalcini
(credit: The Nobel
Foundation)

Rita Levi-Montalcini, along with Stanley Cohen, received the Nobel Prize in Physiology or Medicine in 1986 for the discovery of nerve growth factor (NGF). Rita was the first female Italian scientist to receive a Nobel Prize in Physiology or Medicine and became a prominent advocate for both Italian science and women in science.

Rita and her twin, Paola, were born in Turin, Italy in 1909, to a wealthy Jewish Italian family. Her father was adamant about discouraging his daughters from pursuing a professional career and attending college because he believed it would interfere with their roles as wives and mothers. As a result, Rita initially considered becoming a writer. However, when her childhood governess was diagnosed with cancer, she redirected her ambitions to medical school. After some persistence, she convinced her father to support her

enrollment in the University of Turin Medical School in 1930, where she was one of only seven female classmates. The obstacles Rita faced in pursuing a scientific career only magnified once she completed her MD.

After attaining her medical degree, she worked for Dr. Giuseppe Levi studying the nervous systems of mammals and learning how to stain nerve cells for visualization with a microscope. Her tenure under Levi was cut short when Benito Mussolini released his 1938 Manifesto of Race which led to laws forbidding Jews from working at universities. Wanting to continue research, she moved to Belgium but soon returned to Italy fearing a Nazi Germany takeover of Belgium.

After her return to Turin, Rita and her family went into hiding in 1940, but Rita was not to be deterred from doing research. She set up a laboratory in her bedroom to study neurons and chick embryos, her new research inspired by an article by Viktor Hamburger. A year later, Turin endured heavy bombing and Rita's family was forced to move to a rural village, where they obtained fake IDs to get food rations, and she once again set up her hidden

laboratory. Her research conditions were less than ideal, but she found a way to purchase two microscopes, which she modified herself, and piecemealed together dissecting tools to perform research. She gathered enough eggs to observe that nerves grow towards a missing embryo limb and hypothesized that nerves release a kind of growth factor.

When Germany invaded Italy in 1943, Rita and her family were forced to flee to Florence, which prevented Rita from continuing her research. Towards the end of the war, she used her medical training to work for the Red Cross as a nurse and medical doctor. However, when the war ended, she returned with her family to Turin and began research again. Soon after, Viktor Hamburger invited her to Washington University in St. Louis to join his study of the nervous system and to validate the work done in her makeshift laboratories. What was meant to be a short stay, turned into nearly 30 years of research in the United States.

While in St. Louis, Rita began collaborating with Stanley Cohen to isolate the protein responsible for stimulating the growth of neurons, which they named nerve growth

factor (NGF). She also established a research unit in Rome, where she continued her research on growth factors and began dividing her time between the US and France until her retirement in 1977. In addition to the honor of being a Nobel Laureate, in 2001, her renowned research and science advocacy earned her the distinguished title of Italian senator for life. While she may have officially “retired” in 1977 and 1979, she published her final paper in 2012 when she was 102 years old!

*“Above all, don’t fear
difficult moments.
The best comes from them.”*

Rita was the first Nobel Laureate to reach and exceed the age of 100 years, which should be no surprise considering her determination and resilience to continue practicing science in the most difficult circumstances.

Conclusion

Collectively, these women had profound impacts on our understanding of protein biochemistry and bioengineering through their research efforts on the directed evolution of enzymes, the discovery of odorant receptors and

the identification of growth factors. Despite their own challenges, these Nobel Laureates remain hopeful and excited for the future of women and minorities in science. Stay tuned for continued highlights of the careers and contributions of other remarkable female Nobel Laureates and leading scientists.

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The Life-Changing Magic of the Sallie Rosen Kaplan Fellowship

By Alida Palmisano

Do your daily tasks “spark joy”? Are your skills and talents tidily piled on a shelf, ready to help you succeed at anything that work and life throw your way? If so, congratulations! Please, get a Netflix show and inspire everyone!!

Or, more likely, are you a fellow with overflowing piles of projects, trying to juggle writing manuscripts, performing experiments, analyzing data, giving presentations, participating in networking events, learning new skills, mentoring, as well as having a life with family, friends and other personal commitments? Then, I may have something that can help!

First, a few words about me. I’m a computer scientist with expertise in software and database development, genomic data analysis and visualization. I’m a research fellow at NCI, in the Biometric Research Program (Division of Cancer Treatment and Diagnosis). In 2018, during the fourth year of my postdoc, I applied for the Sallie Rosen Kaplan (SRK)

fellowship. My goals were to get outside my well-established work routine to receive leadership training, expand my network, and take the time to understand career paths that are the best fit for me. There are so many ways we can use our skills in this world, and we are aware of only a fraction of them! Trying different activities, roles, and situations is a great way to expand our horizon and deepen the understanding of what defines a fulfilling career and life for ourselves.

While the SRK Fellowship program provided me with great training and actionable information to advance in my scientific career, what I found to be the most powerful aspect of the experience is the ripple effect in many aspects of my everyday life. Now, I often do, say, or notice things that I wouldn’t have before the fellowship started.

“I call this the SRK effect.”

Whether you want to work on your leadership skills, build healthy habits, expand your network, or improve your grant-writing abilities, just keep reading!

The SRK Fellowship

The SRK Postdoctoral Fellowship for Women Scientists in Cancer Research is supported by the NCI Center for Cancer Training and it was established in 2000 with funds from the estate of Sallie Rosen Kaplan. Mrs. Kaplan was deeply committed to education, even though she was unable to attend a university herself because of family responsibilities. She supported and encouraged the education of her family members, especially women. With this passion, Mrs. Kaplan decided to help support biomedical research at the NIH.

The SRK Fellowship is a highly competitive, unpaid, one-year program for female NCI postdoctoral fellows currently in the intramural program. The fellowship provides mentoring opportunities, networking, seminars, and workshops to prepare women scientists for the competitive nature of the job market and to help them transition to the next career step. SRK fellows from over the last 15

years have established successful careers in many different branches of science: academia, science administration, regulatory science, non-profits, technical writing, technology transfer, industry, and government, just to name a few.

One of the main elements of the program is the 30-week course called “Career Building for Women in Science” which includes two day-long workshops and bi-weekly meetings with a life engineering coach. The SRK Fellowship also pairs fellows with successful women scientists from government, industry, and academia as personal mentors. To complete a well-rounded training, the program has seminars on relevant topics such as networking, grant writing, managing people, time management, and how to present yourself in a successful way.

Personal experience and lessons learned

What I appreciated the most about the fellowship was the opportunity to connect with a group of inspiring and talented women scientists who shared their challenges and suggestions on how to overcome them. The life coach, mentors, the program

manager and leader (Erika Ginsburg), trainers from the Office of Workforce Planning and Development, SRK alumnae, and my cohort fellows were always willing to listen my personal struggles and offer diverse advice in a graceful and non-judgmental way.

If I have to pick the best outcomes for the past year of hard work within the SRK Fellowship, I would list two in particular:

1. I formed a deep friendship bond with my “buddy group” (a small group of fellows that we were each assigned to with the goal of helping each other through the weekly assignments and to hold ourselves accountable for our commitments). I have great respect for the women in my buddy group. We loved our chats so much that we keep meeting weekly even though the fellowship ended and despite the fact that we work on different campuses!! We cherish each other’s advice and we are happy to support one another through our future successes (personal and professional).
2. The continuous work to examine my strengths, skills, and passions resulted in me having a very clear idea of which career

options are best suited for me. I now understand which roles are going to create the highest impact to the world of science research through the best use of my unique personal skills and passions. I have a clear vision of the path forward, and I know how to identify opportunities that would be fulfilling and in line with the personal direction I want to take my own life.

The SRK Fellowship was an incredible opportunity for career development, personal growth, leadership training, and relationship building.

“If you have the chance to apply for the SRK fellowship, just do it!!”

... But what if you cannot apply or you are not selected? No worries, NIH has you covered!! Below are some other training options that for Fellows to gain similar skills and insights to fulfill their career building goals.

Opportunities available to NCI fellows

While the SRK Fellowship is an amazingly rewarding program, not everyone is eligible for the program and/or is willing to commit to the

extensive time commitment that the year-long fellowship requires. NCI and NIH have other great training opportunities for fellows. Here are links to courses hosted multiple times a year by different offices within NIH:

- [**NCI Office of Workforce Planning and Development**](#)
(link accessible within NIH only)
- Office of Intramural Training & Education (OITE)
 - [**NIH Career Symposium**](#)
 - [**Leadership Training**](#)
 - [**Training Events**](#)
 - [**Resources for Career Planning**](#)
- [**NCI Courses for Trainees and Fellows**](#)
- To foster a diverse community of scientists: [**NCI Diversity**](#)

[**Career Development Program**](#)

- To explore careers beyond academic research: NCI Explore On Site ([**EXPOSE**](#)) Program (website requires NIH credential)
- Videos from NIH videocast
 - [**Making a Successful Transition for Your Next Move**](#)
 - [**Planning For Career Satisfaction And Success**](#)

Make a commitment to yourself to deepen the fulfillment and understanding of your career options by attending as many of these opportunities as possible. You will find many that will spark your joy for a career in science!

Informational Interview: A Look into the World of Science Communicator and AAAS Fellow - Dr. Maryam Zaringhalam

By Manasi Apte

*Dr. Maryam Zaringhalam is currently the AAAS Science and Technology Policy Fellow at the National Library of Medicine at the NIH. She received her Ph.D. from The Rockefeller University in 2017 where she worked with the parasite *Trypanosoma brucei* and bioinformatic tools to develop a de novo approach to map a specific RNA modification throughout the transcriptome using next-generation sequencing. After her Ph.D., she decided to move away from the bench to enter the world of science policy, advocacy and communications. In addition to being the AAAS science policy fellow specializing in open science and data science policy projects, Maryam is a producer for the “Story Collider”, a live show that brings true, personal stories about science to live audiences through regular shows, and through a podcast that can be enjoyed around the world. She also co-hosts the science policy podcast “Science Soapbox”, and occasionally writes for outlets like*

Slate, Scientific American, and Quartz.



Dr. Maryam Zaringhalam
(credit: Dr. Maryam Zaringhalam)

I first heard Dr. Maryam Zaringhalam speak at a career panel discussion hosted by FelCom last fall and I was quite fascinated by the various science communication portals she is actively engaged in. I am personally interested in pursuing a career path in the realm of science communication, education and administration, so this article served as the perfect opportunity for me to follow up with her and request an informational interview. In a brief chat over lunch, we talked about her transition from graduate school to the AAAS fellowship and

science podcasts, the importance of science communication in today's world, how to get into podcasting or other means of "sci-comm", and what it means to be an AAAS science policy fellow at the NIH. Maryam was also generous to reach out to me after the interview and provided me with some useful links for all of us.

Thanks for meeting with me, Maryam! Can you briefly tell me when and why you decided to move away from the bench? Was there one event that crystalized that decision?

I was always interested in scientific careers. Almost a year and half into my Ph.D., I sort of knew that strict academia was not for me! My graduate career was a rollercoaster ride in itself. I was working to develop a new technique to extract and mine through all of the cell's RNA to find patterns of pseudouridylation to identify its role in cellular processes. Through the course of my Ph.D., I got scooped four times and had to re-frame all of my research questions. I eventually conducted and published a comparative analysis of these methods and recommended improvements to increase reproducibility. This long exercise

was definitely a factor in deciding to pursue a career away from the bench. But it was a gradual process to decide what to do next.

How did you prepare for career away from the bench?

I was always active outside the lab. I strongly believe that science not communicated is science not done, so I always looked for opportunities to effectively communicate not only to scientific audiences, but also to the general public via various outlets. To that end, I started a blog and public conversation series called [ArtLab](#) that was at the interface of Science and Art. Through this blog, I had the space to talk about my scientific interests to friends outside of my academic circle. Through the ArtLab event series, I could pair artists and scientists in conversations about their work to see how each discipline influences and appreciates the other.

"I strongly believe that science not communicated is science not done."

Along with my colleagues Avital Percher and Devon Collins at the Rockefeller University, I also started co-hosting and producing a

science policy and advocacy podcast called [Science Soapbox](#). Essentially it started as an outlet for us to engage in conversations about science advocacy and to network with people in that field. This has now grown into a platform where we interview many people across the arenas of science communication, policy, research and education.

Did the podcasting experience during graduate days propel you towards becoming a producer at The Story Collider?

Well, I was quite active in science communication and public engagement events in New York City. I had previously attended several live Story Collider shows and was super inspired by this way of telling effective and compelling science-inspired stories. One of the co-founders, a physicist-turned-communicator named Ben Lillie, convinced me to tell a story. He and Erin Barker, who is now our Artistic Director, coached me through my first story. Getting up there for the first time was terrifying, but I am so glad I did it! That's how I got involved with the team. I kept attending more and more shows afterwards and enjoyed the community they built in NYC. When I moved to

Washington D.C., for my policy fellowship, The Story Collider team was hiring for a producer, so I jumped at the opportunity.

What is your role as a producer at The Story Collider? How does your training as a Ph.D. help in your new role?

A Ph.D. is not at all a requisite for telling a science-inspired story or for coaching stories inspired by science. I do think, however, that a Ph.D. holds weight., When I tell a person who hasn't typically identified as a "science person" that they have something interesting and important to say about science, they take that to heart.

As a producer, I work with storytellers to craft their stories. Stories are a really natural form of communication. We tell them all the time, so coaching a story is just about giving a person permission to talk about a transformative experience in their life. We make sure that every storyteller that goes up on our stage has been given the tools they need to feel confident. We'll work with tellers on drafts and help them practice their stories. As a producer, I also work on the logistics for a given show, which includes booking a venue,

communicating with participants, sponsors, other producers, and setting up practice sessions with the participants. Apart from the live shows, we also offer workshops for scientists to learn how to use the tools of narrative storytelling to communicate their work to a wide range of audiences.

“Stories are a really natural form of communication.”

Why is it important to tell a compelling science story in today’s world?

A number of research studies have shown that the perception of the general public about scientists and science greatly lies with how they communicate. There’s one study I find extremely useful that we talk about a lot among the Story Collider team, which was written by [Cydney Dupree and Susan Fiske](#). Essentially, they found that in order to be an effective expert communicator, you need to not only be perceived as competent, but also perceived as warm. Storytelling is one way that we can communicate not only our expertise, but also show our humanity, why we care about the science, and why others should care too.

I am going to switch gears a bit and touch upon your career path so far with your AAAS fellowship. Can you tell me a bit about the project/s you are working on? How were they assigned to you?

I learned about the AAAS fellowship through one of my mentors in grad school. She suggested that I attend the AAAS Annual Meeting, and that led me to meet and network with so many amazing fellows and former fellows. It also made me realize that science policy was something I was interested in.

Currently, I’m an AAAS fellow at the National Library of Medicine. There are around thirty other AAAS fellows working across the National Institutes of Health (NIH) at places like the National Cancer Institute, the National Institute of Neurological Disorders and Stroke, and the Office of the Director. Depending on where you are assigned for your two-year fellowship, the projects that you work on can differ considerably. Most of the time, you work on projects that are ongoing in your office. You can also take on one or two projects that are of personal interest to you, which are aligned

with the interests of your host office.

One project I got to lead is a Reproducibility Workshop, where we invited 25 NIH researchers for a three-day workshop to teach tools to facilitate reproducible research as they worked to reproduce papers for the bioinformatics literature. It was an idea I had in grad school after I got scooped, since I found the process of working to reproduce the papers that scooped me to be incredibly informative.

Any tips to share for fellows interested in applying for the AAAS Fellowship this coming year?

I would highly encourage meeting existing fellows on the campus. Every one of us have benefitted from networking with former and current fellows and would love to pay it forward. Informational interviews are a great start! But keep in mind that AAAS is not the only fellowship opportunity for a career in policy. There are many similar fellowships, and some of them actually don't require for you to be a US citizen or a Green Card holder. You should check this link by AAAS for more information: <https://www.aaas.org/programs/sci>

[ence-technology-policy-fellowships/fellowship-resources](#)

Apart from networking, I think showing demonstrated interest in science policy and advocacy, as well as having excellent communication and leadership skills is crucial to set your application apart for any fellowship. I would encourage you to start a policy blog, vlog, or podcast if you can. Arrange a journal club in your institute discussing current issues in science policy. Try to get an internship opportunity in a local legislator's office or a think-tank. Participate in a Hill Day! On the NIH campus itself, you have a fantastic science policy discussion group, so you can take advantage of that as well.

And finally, for people interested in entering the world of science communications via public engagement, where should one start?

Telling your story effectively is the key! So, whether it is a podcast, a live show, or a public lecture at a science café, you should be sure to ask yourself a few questions: Who am I hoping to reach through this interaction? What is important to them? How can I frame the topic at hand in a way that aligns with what

my audience cares about? What is the best forum to reach my audience? Being deliberate and intentional about your science communication efforts is essential to communicate successfully.

much about how to navigate the world of science communications with different ways of expression and experiments.

“Telling your story effectively is the key!”

If you are interested in a career in science communication at large, I would suggest getting involved with the local sci-comm community. Just show up to various public engagement events, participate, volunteer, and be active! In Washington DC. alone, you have so many events happening all year round... NerdNite in D.C. (<https://dc.nerdnite.com/>), The Story Collider live shows (<https://www.storycollider.org/shows>), Astronomy on Tap D.C. (<https://astronomyontap.org/locations/washington-dc/>), D.C. Art Science Evening Rendezvous (DASER), Science cafes at various locations, and D.C. Science Comedy nights are just a few.

It was amazing to hear Dr. Zaringhalam talk so passionately about her career, goals and interests. I thanked Maryam for the opportunity to meet up with her and left our chat having learned so

Transitioning from Postdoc to Industry: An Interview with Dr. Barbara Helen Rath

By Sarwat Naz

I met Barbara when she worked as a postdoc at NCI and was a member of CCR-FYI. She mentored me and helped me transition to a subcommittee chair role in CCR-FYI. When I met with her last fall, she shared two items of good news: First, that she had become a proud mother of a little girl and second, that she successfully transitioned to industry!

I was happy to hear about her new position at Merck. In our short conversation, I learned about how she searched for jobs and prepared for interviews while balancing her new responsibilities as a new mom. Being a mother of a little one myself, I found her very brave and positive in managing her career aspirations while taking care of a young one. It was very inspiring for me, so I decided to learn more about her journey. I hope this interview will also be useful to other fellows who want to transition to industry.



**Dr. Barbara
Helen Rath**
(credit: Dr.
Barbara Helen
Rath)

**Can you tell me
in short about your career path
up to the current job?**

I started my science career back in Cologne, Germany, where I received an apprentice degree in biology. From there I moved to Munich to pursue a Master of Science in biotechnology engineering (or what's called a Diplom Ingenieur in German), to satisfy my love for biology and mechanics. After finishing these studies, I pursued a PhD in the field of molecular biomedicine, with the focus on stem cells and cancer stem cells at the University of Bonn. Later, I joined the Radiation Oncology Branch of NCI first as a postdoc and then as a research

fellow because of my interest in neural cancer stem cells.

Can you briefly describe your current role at Merck?

My current role at Merck as a senior scientist is to lead and contribute to multiple different types of projects, comprising of early-stage and late-stage drug discovery and development efforts. My background in pre-clinical evaluation of drugs for its action and efficacy is highly useful in my current position.

What made you decide to move into industry rather than stay on the academic track?

I did not have a preference between staying in academia or moving to industry. I knew that I would probably thrive in a more fast-paced industry environment based on my experience from multiple internships in industry during undergraduate and graduate school. I also love mentoring and wanted to give academia a shot.

One of the deciding factors was the funding scenario in academia. Not a lot of people outside of academic organizations understood that there are limitations regarding the

funding sources for postdocs at NCI. The lack of grant experience on my resume, the urge to work in a fast-paced environment, and not having to do “hip” research just to get funded rather than what I love steered my decision to move to industry.

“I wanted to pursue research around drug discovery and work on something which may be in the clinic in a few years.”

This overall thought process made me decide to move to industry.

Can you describe your typical workday at Merck and how you manage your time?

My typical work day varies. It includes literature research and reading papers, bench work, project planning, management and meetings. It all depends on the stage of the projects you are involved in and whether a project is getting fast-tracked or not. I would say that 60% of my day is working at the bench and 40% is at my desk and meetings. I plan my days ahead and usually block off time in my calendar for experimental tasks like cell culture, so that people can see when I’m busy if they want to set up meetings. Since my

commute is a bit longer, I use that time to catch up on reading literature, working on presentations, and updating my electronic lab notebook.

How did you find your move from academia to industry? Tell us more about the transition.

I found the move easy because Merck Research Laboratories (MRL) have more of an academic setting with respect to the structure and freedom of research. At MRL you get an onboarding buddy to whom you can go to if you have any questions. This was very helpful during my first couple of weeks.

How did your post-doc and research fellow experience at NCI help you prepare for your position today?

From my perspective, it helped me to be proactive and open to collaborations. I was an active member for multiple years. During my time at CCR-FYI I gained project managing experience and soft skills outside the lab, which is helpful in my day-to-day job as part of a team or project leader here at MRL. Additionally, the resources provided by the NIH OITE and NCI CCR-FYI such as PASS (Presentation And Seminar Skills)

were important for my career development. I highly encourage everyone to take advantage of PASS, the Frederick Seminar Series, and other opportunities to practice communicating science, which is a vital skill at MRL.

“In addition, what really prepared me for my position was my close association with NCI CCR-FYI.”

How much networking was involved to get your current position?

I did not network to get my current position. It all started with me looking for positions occasionally on Indeed and LinkedIn. I stumbled across the position that I got hired for at Merck. The job description sounded very interesting and fit my expertise, so I gave it a shot and applied. I almost forgot about my application for the position until I got an email from my current manager at Merck and had the initial phone interview with him the next day. We kind of “hit it off” and I got invited to have an on-site interview in Boston. At the in-person interview, I had the feeling that the “vibe” was great and that I would be a good fit to this team. The hiring manager contacted me the next day and asked to contact

my references (which is a good sign) and that was it.

However, I know that networking is still a big part of getting a job, even it's only for informational interviews to help you to get an idea what you want to do after a postdoc. In addition, once you know someone in industry (maybe some of your former colleagues), keep in touch with them! Send them an email occasionally, ask how things are going, contact them for advice, or see if they would be willing to serve as a reference. I also had a good experience with networking on LinkedIn. I sometimes get emails from recruiters and occasionally recommend people who might be a good fit for the advertised jobs.

What do you like most about your current job?

It's hard to tell. I like working in a team, driving cutting edge early drug discovery forward, and seeing potential drugs moving through discovery stages and entering clinical trials. MRL Boston is highly collaborative, so if you want to do 'X' you go to an expert in 'X' and can get help/advice from the person. I also like that I can broaden my horizon and get experience in fields other than the one I am currently working in, such

as infectious disease. Of course, there are also all the industry perks, such as free coffee and food. Working for Merck and being in a company that is the leader in immuno-oncology is very rewarding.

Do you have any advice for postdocs considering careers in the biotech and pharmaceutical industry? What can they do to make themselves competitive?

I think the most important thing that I did as a postdoc was joined NCI CCR-FYI, that helped me acquire skills to be successful in my current job. My advice for other postdocs will be to

- Get involved! Don't hide behind experiments. Don't pretend that you cannot spare an hour of your time a week (if that) to write an email or talk to people. Help organize the CCR-FYI colloquium or OITE events. Getting involved helped me to improve my presentation, public speaking and small talk skills, which are vital if you want to land a job in industry. Getting involved with events at NIH, is the most important thing I took away from my years at the NCI. This what made me stand out

from the rest of the candidate pool, besides publications.

- Network with your peers! As these are the people you will be working with in the future.
- Sharpen your presentation skills! If you don't think that you are a good presenter, there is always room for improvement. Get help and attend seminars and workshops offered at the NIH.
- Have a backup plan! Try multiple different things. Don't just have a plan B, but also a plan C. Be open about different career options
- Do informational interviews! If you are not sure if a career path is right for you, email people through LinkedIn and explain your situation. Ask if they have time for an informational interview to get more insight into the respective position.

- Awareness! I also think it's very important that if you are invited for an on-site or phone interview, that you try to find out as much as possible about the person and company. Go on Google and LinkedIn. Look on PubMed to see what they have worked on during their PhD and post-doc, since there may be a connection to your career journey. Find common ground. In addition, I had some questions prepared on my day of the interview, such as "Have you ever worked on a target/compound which successfully made it into the clinic or is in preclinical testing?"

All these helped me stand out from the rest of the candidate pool, besides publications.

Networking - Where to Start

By Molly Congdon

As fellows advance their careers, they will find themselves in more networking settings: scientific conferences, career fairs, and working with collaborators, just to name a few. In the previous part of this series we reflected on the fact that networking is a daunting task for many in the training stages of their career.

During his TED talk, David Burkus, associate professor at Oral Roberts University, author and leadership speaker, stated simply why many find this task so challenging: “Your network has a massive effect on you.”¹ According to Dr. Phil Ryan in the NIH Office of Intramural Training and Education (OITE), when boiled down to its basic tasks, networking is all about “meeting new people, growing current relationships, and figuring out how each person can benefit from knowing each other.”² In other words, networking is not all about you. Yes, you are purposely connecting with people to further your career and reach your personal goals; however, networking is a two-way street. The old sayings “one hand washes the

other” and “you wash my back and I’ll wash yours” are highly relevant to networking relationships.

According to Burkus, networking can also be thought of as “understanding the network that is around you and acting accordingly... understanding who is a friend, and who is a friend of a friend.”¹ Just as you are looking for people to help you, others are looking for people to help them. If you want people to invest interest in your career, you should invest interest in theirs as well.

The first, and frequently the scariest step, is introducing yourself to new people. When you have to step out of your circle to make new connections, “the best way to do that is through friends-of-friends.”¹

“If you are meeting a friend-of-a-friend or a stranger at a career networking event, it’s an excellent idea to have a brief summary of yourself (known as an “elevator pitch”) ready to use at a moment’s notice.”

When preparing your elevator pitch, you should think about key things you want the person to know about you: “who you are, where you work, what you do, what you are looking for”², or an interesting personal fact about a hobby, passion, or non-work interest.^{1, 3} Moreover, your elevator pitch should be concise and memorable.

When introducing yourself, you also want to be prepared to have a conversation with the people you are networking with. As a result, you should have a few general questions and topics at hand to discuss. These don’t need to be earth shattering or inspirational. You may want to discuss recent science headlines, additional details about the person’s work based on his/her elevator pitch, information related to the event you are attending, travel experiences, or even the weather.

As Burkus straightforwardly stated, “the more and more diverse ways we connect with another person, the deeper the relationship we build faster... So find a non-work way to connect.”¹ Try to avoid any questions that can easily be answered with yes and no. Keeping your questions open ended and asking for an opinion will allow people to offer a broad

range of responses that you can build a discussion off of and enable you to develop a relationship. It will also let people know that you are interested in getting to know them.

In this fast-paced world, it is important to not carry on the conversation too long. It is vital to have an end goal: ask for a business card, if you can connect on LinkedIn, or if you can send them an email to follow up on the conversation. Remember, your end goal will vary depending upon the person that you are speaking with and the type of relationship you hope to build with them.

Unfortunately, you can’t expect to make a new connection with someone who can instantly and substantially help you in your career goals. In his interview with Forbes, author Eric Barker frankly stated why this is the case. “Nobody likes when somebody pops up into your life again and immediately asks for a favor.”⁴ Every networking connection or relationship is unique and will require a different amount of effort or maintenance. There are different levels of relationships: important/active and casual/impersonal, as well as different methods for keeping in contact: in person and online. Both

the relationship level and method of contact affect the amount of time and upkeep the relationship requires. Methods of how to maintain networking relationships will be discussed in depth in subsequent parts of this series. The more substantial the desired action you want out of a connection, the more you need to invest in the relationship.

“Networking is a skill that comes best with practice.”

No one is instantaneously good at it. The best thing to do is practice. Practice your elevator pitch with friends and labmates. Expand your networking by reaching out to “low hanging fruit” connections: other fellows and friends-of-friends, as well as dormant ties/relationships, people who you used to be close to and haven’t talked to in a while. “It’s easy, you already know these people. And...that’s where some of the best opportunities come from.”⁴ Attend a variety of networking events, such as those listed in the first part of this series “Networking – Nervous? You are not alone.”⁵ As fellows of the NCI CCR, we reside in a scientific hotspot in the country. Networking opportunities are all around us. With practice and

feedback, you will be able to hone your unique way to memorably introduce yourself when attending conferences, networking events, and even in other aspects of your life.

Future parts of this series will focus on reviewing the “Networking” workshop that was part of the 2019 CCR-FYI Colloquium and on how to effectively maintain your network once you have established new contacts.

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Join the 2020 FYI Colloquium Planning Committee!



Are you interested in networking with extramural scientists, exploring alternative careers in science, or giving back to the community? **The 2020 planning committee forms in July 2019. To join, begin attending the CCR-FYI monthly meetings in Bethesda and Frederick on the last Thursday of the month, at 11am.**

Subcommittees and descriptions:

- **Schedule** – Plans and maintains the meeting schedule
- **Theme** - Selects the theme for the colloquium
- **Survey** – Manages surveys to vote for speakers, themes, and workshop/panel topics
- **Keynote speakers** – Invites extramural and intramural speakers, the survivorship speaker, and the training directors for opening and closing remarks
- **Panels and Workshops** – Invites panelists and presenters
- **Abstract Book** – Prepares the Colloquium abstract book
- **Abstract Judging** – Manages abstract judging and notifies selected abstracts for oral and poster presentations
- **Logistics and Publicity** – Raises community awareness about deadlines for abstract submission and registration. Improves awareness throughout the CCR community to strengthen attendance and participation.
- **Awards** – Manages nominations and judging for Outstanding Postdoctoral Fellow, Outstanding Postgraduate Fellow, and travel awards

Providing Valuable Training Experiences for CCR Fellows

For more information, please contact:

Jessica.Eisenstatt@nih.gov and Amy.Funk@nih.gov



Are you interested in a career in science journalism or mass media communication? Join the CCR-FYI Newsletter Team to gain valuable experiences and skills!

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To join, please contact: claire.mccarthy@nih.gov

Join the Fellows and Young Investigators Steering Committee!



Are you interested in networking with other fellows, exploring alternative careers in science, gaining marketable skills, or giving back to the community? Join the CCR-FYI SC! Meetings are held monthly in Bethesda and Frederick on the last Thursday of the month, at 11am.

Subcommittees and descriptions:

- **Community Life Subcommittee** – Welcomes new fellows during orientation
- **Social Chairs** – Plan and host social and networking events throughout the year
- **Newsletter** – Writes, publishes and edits the quarterly CCR-FYI Newsletter
- **Outreach NCI-SC** – Organizes outreach events in the community
- **Scientific Subcommittee** – Organizes the Bethesda PASS and Frederick Seminar Series
- **NPA Liaison** – Represents the CCR-FYI at the NPA annual national meeting
- **Felcom Representative** – Represents the CCR-FYI at the NIH Felcom meetings
- **Graduate Student Representative** – Represents graduate students in the NIH community
- **Postback Representative** – Represents postbacs in the NIH community
- **E-Communications** – Updates and maintains the CCR-FYI Wiki and LinkedIn pages
- **Bylaws Subcommittee** – Updates and maintains the CCR-FYI SC bylaws
- **Colloquium Planning Subcommittee** – Organizes and hosts the CCR-FYI Annual Fellows Colloquium



Providing Valuable Training Experiences for CCR Fellows

For more information, please contact:

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