Bridging Science: Q&A with Jenna Shapiro

Jenna Shapiro is a PhD Candidate in the NIH Oxford-Cambridge Scholars Program. She splits her time between the Oyen lab in Cambridge and the Stratakis lab at the NICHD, combining engineering and biology to study how cells interact with the extracellular matrix in bone. In September of 2013, Science Careers published Jenna’s “In Person” narrative about training as an interdisciplinary scientist. Her essay, “Can I Get a Ph.D. in Collaboration?” explored the nuances of bridging disciplines in lieu of a single field of study. Jenna has graciously agreed to answer a few questions for The NICHD Connection about her experience with interdisciplinary science:

When you began your PhD research, did you enter the program knowing you wanted to become an interdisciplinary scientist? What prompted you to go down that road?

Yes—I have been interested in the relationship between engineering and biology since high school. I had the opportunity to work in Dr. Kim Anderson’s laboratory in the Department of Chemical Engineering at the University of Kentucky during my senior year. That experience gave me the push to explore biological problems from an engineering background—I ended up majoring in chemical engineering, and minoring in biology. When I was looking for graduate school programs, I wanted to continue in the same path, and really searched for opportunities that would allow me to do so. That’s why I was thrilled to enter the NIH-Cambridge Program.

What is your typical day like as an interdisciplinary scientist?

I wouldn’t say that it’s terribly different from the typical day of any scientist. I’ll do literature searching, experimental planning and execution, data analysis, writing, editing, etc. I would say that I may just approach these tasks from a slightly different mindset, knowing that there are a few other variables I should be looking at when designing experiments, or other journals that I should be reading.

(continued on page 3)
Letter from the Editor

There is a growing trend in science. As we dig deeper into the workings of the cell, and technology becomes more complex, teams of scientists from multiple disciplines are tackling questions in novel ways. This new frontier is known as interdisciplinary science. For several months, I’ve brainstormed about interdisciplinary science articles, only to realize that the topic is too large and important to cover in one, or even two, issues. For this reason, I’m excited to announce that The NICHD Connection will begin a new column: “Bridging Science.” For our inaugural installment, PhD-candidate Jenna Shapiro shares her experience as an interdisciplinary scientist in training.

Whether you work in a specific field or on an interdisciplinary team, you will need to showcase your work to others when looking for a job. To help fellows exhibit their work in an effective manner, the NICHD Office of Education held two important seminars about writing resumes and presenting research in three minutes or less. Didn’t get to attend? Fear not, you can find comprehensive recaps within this issue.

Finally, the NICHD Public Communications Branch recently highlighted top-notch work from trainees in the McBain lab, and we’re happy to bring you the story here in case you missed it.

Enjoy the first day of spring! (Although, as I write this, it’s snowing…again.)

Your Editor in Chief,
Shana R. Spindler, PhD

Please send questions, comments, or ideas to Shana.Spindler@gmail.com.
Bridging Science: Q&A with Jenna Shapiro
(continued from page 1)

In your article, you describe the language barrier between scientists of different disciplines. You go on to say it’s not only a language barrier, but also a different way to approach problems (top-down versus bottom-up). How have you reconciled these differences between your two labs? Are you ever given opposing guidance depending on the mentor?

Sometimes I feel like the problem approach can be more of an obstacle than the languages of the different fields. You can always pick up jargon, but problem solving seems to be more ingrained as a particular mindset and potentially more difficult to change. In my particular situation, I’m fortunate. One supervisor (Dr. Stratakis) is a clinician-scientist, and the other (Dr. Oyen) is an engineer. I feel like clinicians and engineers both operate from the top-down approach: have a problem in mind, then do what you need to solve it. Clinicians could just be considered medical engineers—designing solutions for patient-oriented problems. I don’t feel that I’m given opposing guidance. Depending on the primary field of the particular project I’m working on, I defer to one mentor or the other; and this seems to work well.

How do you handle the technical balance required to be an interdisciplinary scientist?

I’m fortunate in that tissue engineering originated as an interdisciplinary field. In this way, the majority of the literature I read focuses on multiple aspects of a problem, for example, exploring how the material composition of a scaffold can influence cell proliferation. There’s an inherent interplay between the different disciplines. If I want to know something more about the engineering aspects, then I might read more articles in engineering-related journals. The same applies if I need to focus on signaling pathways, or genetics. Of course, it helps that I have the support from both of my labs, the two of which specialize in very disparate things.

Do you ever feel like you experience “imposter” syndrome more than others given that you need to become literate in two fields?

I’ve definitely experienced imposter syndrome. I think that comes as a function of working in such well-renowned research institutions as NIH and Cambridge. I don’t think it happens any more frequently because of my interdisciplinary work. If anything, it may lessen it, because I know that I can draw from a wider, if not necessarily deeper, pool of knowledge. I have to remind myself that I’m a student—this is all a process of learning, acquiring, and assimilating information, and I’m not expected to be an expert...yet.

In your experience, do you see more of your peers entering interdisciplinary research? Do

(continued on page 4)
**Bridging Science: Q&A with Jenna Shapiro**

(continued from page 3)

you see this becoming a field in itself—for example, departments seeking “bilingual scientists” who have the ability to foster collaborations between programs?

I still see a good mix. I feel like the choice to do interdisciplinary work is very personality-dependent—perfect for those of us who don’t enjoy being decisive. Science is like being a kid in a candy store—all of the fields have something fantastic to offer, how can you choose just one? The interdisciplinary scientists are the ones buying the 5 lb variety packs.

I don’t know if “interdisciplinary” will necessarily become its own field. By definition, it’s drawing from the strict disciplines. I think it will be beneficial for departments to employ interdisciplinary scientists, not only to collaborate with other programs, but also to bring in different viewpoints and approaches to the work already being done (not just because I want a job!)

**What do you think is the biggest barrier for someone who wants to get into interdisciplinary science and what is your advice?**

I think the biggest barrier might be determining what level of knowledge and familiarity is necessary for each of the fields. It’s so easy to feel like you have to be an expert in everything—you don’t, but at least a baseline level of understanding and an awareness of what’s happening in the field is critical. I think the best way to accomplish this is to read the literature, and talk to colleagues.

As you know, the NICHD is a melting pot of disciplines. As an interdisciplinary scientist, what’s your best piece of advice to NICHD fellows who are collaborating with scientists in a different field?

I think it all really comes down to communication. Talk to the people around you. Ask questions. Don’t be afraid to look like you don’t understand. I think the British model may have an advantage here—somehow a cup of tea in the afternoon facilitates some amazing discussions

Perhaps it’s the casual environment, or the opportunity to step away from the desk or bench for a few minutes, but I’ve seen some excellent ideas come from just chatting to people. (Maybe NICHD teatime wouldn’t be amiss?)

Check out Jenna’s full “In Person” essay at [http://sciencecareers.sciencemag.org/career_magazine/previous_issues/articles/2013_09_11/caredit.a1300196](http://sciencecareers.sciencemag.org/career_magazine/previous_issues/articles/2013_09_11/caredit.a1300196)
Resume Workshop Recap
By Sudhir Rai, PhD

Presenting yourself in a competitive world is a tough challenge for anyone. It requires a lot of time, energy, and attention to be crystal clear. The best way to describe your professional credentials is to use a simplified format—usually referred to as a resume.

The NICHD Office of Education organized a resume-writing workshop for postdocs on January 28, 2014. Dr. Lori Conlan, director of the Office of Postdoctoral Services in OITE, provided important tips and suggestions on how to develop a resume and cover letter for academic and industrial positions.

Components of Resumes
In the first 30 minutes, Dr. Conlan discussed resume components. Remember, a resume is different than a curriculum vitae (CV). While a CV can stretch in length to incorporate all of your academic achievements, a resume is a marketing tool meant to convey relevant experience, accomplishments, and education in a succinct format. Resumes—unlike CVs—are adapted to each job position or employment sector.

A resume will have several sections that highlight your education, work experience, and general skill set. For each section, be specific using actual examples from your work history and be sure to describe what you have done in a way that’s relevant to where you’re applying. The resume should be one to three pages, with subcategories such as:

**ALWAYS ITEMS**
- Contact information
- Education
- Certifications/Licensures
- Research/Employment history
- Skills

**SOMETIMES ITEMS**
- Summary of Qualifications
- Teaching/Mentoring
- Leadership
- Honors and awards
- Service
- Memberships
- Grant support
- Relevant Coursework
- Major invited speeches
- Patents/Inventions
- Publications

Exactly what terms you include in your resume will differ between an academic and industry application. Resumes for industry jobs benefit from a specific set of descriptors. On an industrial resume, you might find words and phrases like:
- Communication
- Problem solving
- Team-work
- Self-motivation
- Initiative
- Logical thinking
- Ability to work under pressure
- Time management
- Work ethic
- Dependability
- Adaptability
- Leadership
- Organization
- Self-confidence

(continued on page 6)
Resume Workshop Recap  
*(continued from page 5)*  

Next, Dr. Conlan introduced us to a very important concept, called a “computer filter.” Various companies automatically screen applications by terms used in the job advertisement. Therefore, the resume should be very specific in word choice and use terms presented in the advertisement so that it can pass through the preliminary processing. Also, you should keep in mind that there are key terms that are job-specific. For example, you may use the word “mentor” in academia, but you should use words like “supervise” and “employee feedback” for industry positions.

**COVER LETTERS: DESIGN AND COMPONENTS**

The resume writing workshop also highlighted key components of cover letters. Dr. Conlan described the three major components of a cover letter:

(A) **PART-I**

The starting paragraph of a cover letter must contain the advertisement number, the website where they released the advertisement, and a description about where you are working and how long you’ve been there.

(B) **PART-II**

This is the main body of the cover letter. You should describe your skills, how you are fit for this position, and how your skills are going to boost their organization.

(C) **PART-III**

In the last section of a cover letter, end with a thank you.

Overall, the Resume Writing Workshop was an excellent session for the NICHD postdoc community, made even better with cover letter writing tips. Postdocs should take advantage of these services provided by the NICHD Office of Education and the NIH Office of Intramural Training and Education to improve their visibility in a competitive environment.
Three-Minute-Talks Workshop: Part I
By Parmit Singh, PhD

You should refer to the slide and not defer to the slide during a presentation. This was the main theme of the Three-Minute Talks (TmT) workshop, led by Mr. Scott Morgan on January 30, 2014. This year, the NICHD is holding the first NICHD Science Communication Awards “TmT” Competition, a chance for postdoctoral fellows to communicate their research to a broad scientific audience in three minutes or less. The NICHD will then use winning presentations to promote the research of trainees on our website. During primary screening, seventeen postdoctoral fellows were selected on the basis of their submitted abstracts.

The competition is a multi-step process. This first workshop teaches us how to prepare and present our results within three minutes and with only one slide. For the next round of training, judges will select 10 postdocs on the basis of their individual presentations before an audience. Finally, the judges will select the top three as a winner for this year.

At the beginning of the workshop, Mr. Morgan showed us two videos of students who participated in the Three Minute Thesis (3MT) research communication competition, which was developed by the University of Queensland in Australia. After each video, we discussed the plusses and minuses of each presenter. Unanimously, everyone agreed that the first presenter gave a better speech than the second one. Some of the main differences between the presenters were the following:

1. The first presenter made 100 percent eye contact with the audience, whereas the second presenter kept turning her head towards the slide.
2. The first speaker had less content, so she was relaxed and slow. However, the second presenter had more data and had to rush.
3. The first talk showed a personal touch of the presenter, as she mentioned “I published” and “We are first to show.” Such first-person statements show that you enjoy and know your subject. This was totally absent in the second talk.
4. The second speaker had no money slide, i.e., she did not highlight anything from her slide, whereas the first presenter did this for her hypothesis and final result. It is essential to recognize and stress the main goal or question of your work. Moreover, the end should be powerful and give a take-home message.

(continued on page 8)
Three-Minute-Talks Workshop: Part I
(continued from page 7)

During the second part of the workshop, Mr. Morgan presented the funnel model of a presentation. This model suggests that we should start our presentation from a broader view to capture a large audience, and then quickly narrow down to the specific question or aim. This should be followed by a discussion on the data and finally a main result with a broader implication.

Next, the participants presented their work in three to four sentences, starting with either a specific question or the relevance of their work. Depending upon the choice that people made, Mr. Morgan suggested several tips for improvement, and then it was open for discussion among the participants. The suggestions are summarized below:

1. Clearly define the aim or the goal.
2. Keep just a single aim.
3. Be inclusive or broader at the start and then narrow the focus.
4. Make 98 percent eye contact with the audience.
5. Don’t turn around; just believe the slides are behind you.
6. Start with relevance or specific questions or broad data points. Don’t start the talk by focusing on a narrow audience. For example, you can start your talk with how your work is having a global impact on things like HIV/AIDS, cancer, tuberculosis, etc. The impact of these on the world population is well known.
7. Give a one-line reason why you chose your work when you are narrowing your talk from broader relevance to your specific topic. For example, our immune system works via various ways to protect our body. Autophagy is just one such part of the immune system. Then you have to mention why you chose autophagy instead of other parts of the immune system.
8. Give a parallel analogy. This means trying to connect with the audience by comparing your results with a common example or idea.
9. Have a powerful ending. Try to give a strong message at the end with broad relevance, like at the start.
10. Don’t use small numbers to show the relevance of your work. For example, instead of saying that 10 percent of the population has sterility, try using the percentage of a specific age group. The second idea is to make a big number by showing the affected population, which will be in the millions, instead of a percentage.
11. Support graphs and mechanisms with a picture.
12. There should be at least one money slide that clearly shows the aim and the main result.
13. Don’t confuse the relevance of your work with the aim of your work. Relevance addresses the problem on the broader scale. It is not a question. Whether you start with relevance or not, you have to tell your specific question.
14. Don’t use “I prove” or “I will convince you.” Everyone is independent in thinking. The moment you say this, they will be reluctant to accept your idea.
15. Don’t tell funny or silly things just to create humor.
16. Avoid video if possible because, unlike a static slide, a video will cause the audience to focus on the video and not what you’re saying.

I hope that fellows can use these ideas to make their presentations powerful and more expressive.
NICHD Spotlight: Solving a Puzzle in the Brain
By the NICHD Public Communications Branch
Originally published online February 10, 2014

NICHD JUNIOR RESEARCHERS MAKE SENIOR CONTRIBUTIONS TO NEUROSCIENCE RESEARCH
Outside of rare “eureka” moments, breakthroughs usually result from the collective contributions of everyone on a research team, from the tenured senior scientist to the most junior researcher.

Junior researchers—often students in college, graduate school, medical school, or even high school—come to the NICHD and other NIH Institutes through programs such as the NIH Summer Internship Program and the NIH Postbaccalaureate Programs. These programs provide critical opportunities for students and new investigators to learn about research, research careers, and research institutions.

They also get to contribute to science, sometimes in new and exciting ways. Such was the case in the NICHD’s Section on Cellular and Synaptic Physiology, headed by Chris McBain, Ph.D. In his neuroscience lab, within the NICHD’s Division of Intramural Research (DIR), the experiments of junior researchers provided key pieces of a big puzzle: They revealed a new type of brain cell. Select a link to learn more.

» Laying the Groundwork for Discovery
» Research Experiences Inspire Future Achievements
» A Rich Environment for Neuroscience
» More Information

LAYING THE GROUNDWORK FOR DISCOVERY
In the neuroscience lab of the NICHD’s Dr. Chris McBain, four junior researchers—clockwise from upper left, Carla M. Lopez, Ashely McFarland, Scott Gerfen, and Barry Liang—helped discover a new kind of brain cell.

In 2009, the staff scientists in Dr. McBain’s lab made a strange, chance observation: a strain of mutant mice had a type of brain cell the animals shouldn’t have. Intrigued, the staff designed a series of small experiments to look more closely at these cells, called oriens-lacunosum moleculare (O-LM) interneurons. Then, they called on four junior researchers to conduct these experiments in the lab. Over the next four years, these junior researchers investigated the activity and development of the O-LM cells.

The unique cells at the center of the experiments were actually discovered 20 years earlier by Dr. McBain when he was a postdoctoral scientist. Previous research by

(continued on page 10)
McBain and others had shown that O-LM interneurons played a role in the activity of the hippocampus, a section of the brain that is crucial for learning and memory. Specifically, the work showed that O-LM inhibitory neurons used or responded to two types of chemicals, known as neurotransmitters, that helped control brain signals passing through the hippocampus and from other parts of the brain. Dr. McBain’s lab focuses on the development and maturation of circuits in the brain, including the control of the circuits’ activity by interneurons such as O-LMs.

Neither Dr. McBain nor others in his field had reason to think that there was any other type of OLM interneuron than the type he had known for the past 20 years—until the experiments conducted by his junior researchers and other lab members showed him otherwise.

“It was like a jigsaw puzzle,” said Dr. McBain. “Each of them contributed a unique piece, and only when we saw it all together did we realize what we had.”

The junior investigators uncovered a subset of O-LM cells that “switched on” in response to another neurotransmitter, serotonin.

“They made the observation that what we had was actually not one but two distinct types of O-LM interneurons, with identical anatomies, but with distinct functions, and arising through different developmental pathways,” said Dr. McBain. “These differences indicated that although the two cell types occupy similar positions within the hippocampal architecture, they have unique roles to play.”

The entire lab group—including junior researchers who participated when they were in high school or college—published their findings in the November 2013 issue of the journal Nature Neuroscience, no small accomplishment for even seasoned investigators.

“The groundwork they laid was the single most important part of this discovery,” said Dr. McBain.

**RESEARCH EXPERIENCES INSPIRE FUTURE ACHIEVEMENTS**
For several of these junior researchers, the discoveries they made in the McBain lab served as a foundation for future studies in neuroscience.

When Carla M. Lopez came to the McBain lab in August of 2011, she had a baccalaureate degree and an excitement about contributing to science. Under the mentorship of NICHD staff scientist Ken Pelkey, Ph.D., and through the [NICHD Scholars](#) and [NIH Academy](#) programs, Ms. Lopez spent two years contributing

(continued on page 11)
to the lab’s research. Now a first-year student at the Yale School of Medicine, Ms. Lopez plans to continue conducting neuroscience research and looks forward to a career as a physician-scientist and mentor.

“I am still awed by how fortunate I was to be allowed to play such a meaningful role in the journey toward scientific discovery,” said Ms. Lopez. “I will forever be grateful for the invaluable mentorship I received in the McBain lab and the wealth of opportunities provided by the NICHD.”

Barry Liang was still a high school student when he arrived in 2012 to spend his first of two summers working in Dr. McBain’s lab. His goal was to gain laboratory experience and to learn more about neuroscience, a field whose many unknowns excited him. Mr. Liang’s main role on the O-LM project was to analyze the structure of interneurons after they were imaged.

“The McBain lab inspired me to learn more about neuroscience,” said Mr. Liang, who is now studying biochemistry and physics at St. Mary’s College of Maryland and is planning a career as a researcher.

**A RICH ENVIRONMENT FOR NEUROSCIENCE**
This work is just one example of the ongoing neuroscience research taking place in the intramural laboratories at the NICHD. Many of DIR research units focus on neuroscience, including the six labs in the Program in Developmental Neuroscience, which Dr. McBain directs. Individual labs in several other programs, including the Program in Developmental Endocrinology and Genetics, the Program on Genomics of Differentiation, and the Program in Reproductive and Adult Endocrinology also study neuroscience topics.

The neuroscience research conducted at the NICHD complements the neuroscience research that the Institute supports through its extramural program, which was the focus of the Picture This: NICHD Support for Neuroscience Research spotlight published in 2013. Regardless of whether it occurs at NICHD’s intramural labs or at labs around the country, NICHD’s neuroscience research aims to improve the health of infants, children, and women.

DIR neuroscientists like Dr. McBain and his laboratory team—senior and junior investigators alike—study the basic processes of the brain to advance our understanding of brain development and disorders, treatments for brain disorders, and other areas that improve the health and functioning of our brains throughout the lifespan. Within the context of this work and its impact, there are no junior contributions.
March Announcements

SUBMIT YOUR ANNUAL MEETING ABSTRACTS—DUE MARCH 14

Abstracts for the NICHD Tenth Annual Meeting of Postdoctoral, Clinical & Visiting Fellows, and Graduate Students are due this month. All meeting attendees need to present a poster or give one of the four oral presentations. All abstracts should summarize your research project(s), including an introduction, a description of the experimental techniques, key results, conclusion statements, and future directions. The body of your abstract should not exceed 300 words. Please submit your abstract by Friday, March 14. For more information, please visit http://retreat.nichd.nih.gov. See you there!

DO YOU HAVE AN OUTSTANDING MENTOR?

The time has come for you to nominate your fellow or PI for the DIR’s 2014 Mentor of the Year awards. This is a wonderful opportunity to recognize an individual whose mentoring has made a difference in your life here at NIH!

Below is the link to obtain information about the NICHD’s two annual Mentor of the Year Awards, one for a fellow and one for an investigator. Please submit your nomination form and 500-word (maximum) narrative electronically to Yvette Pittman: yvette.pittman@nih.gov. The submission deadline is Monday, April 28th. Dr. Pittman will also be happy to answer any questions you may have about the nomination instructions and selection process.

https://science.nichd.nih.gov/confluence/display/fellows/Mentor+of+the+Year+Awards+2014

OPPORTUNITY TO WIN A $1000 TRAVEL AWARD** AND ENHANCE YOUR CV!

The FARE (Fellows Award for Research Excellence) competition provides recognition for outstanding intramural scientific research. FARE 2015 winners will each receive a $1,000 travel award** to facilitate the presentation of their exciting, novel research at a scientific meeting. Eligible fellows may submit an abstract of their current research online from February 14 - March 17, 2014 at http://www2.training.nih.gov/transfer/fareapp.

Abstracts will be evaluated anonymously on the basis of scientific merit, originality, experimental design, and overall quality/presentation. The top 25 percent of applicants will receive a travel award to be used between October 1, 2014 and September 30, 2015.

(continued on page 13)
March Announcements
(continued from page 12)

The FARE 2015 competition is open to postdoctoral IRTAs, CRTAs, visiting fellows, and other fellows with less than five years total postdoctoral experience in the NIH intramural research program. In addition, pre-IRTAs performing their doctoral dissertation research at the NIH (e.g., members of the Graduate Partnerships Program) are eligible to compete. Visiting fellows/scientists must not have been tenured at their home institute at the time of submission. Questions about eligibility should be addressed through our Office of Education, for review by the Scientific Director.

More information regarding the FARE Rules and Regulations can be found at https://www.training.nih.gov/felcom/fare/faqs.

Winners will be announced by August 15, 2014. Questions can be directed to the FARE 2015 Committee: FARE@mail.nih.gov

**In the event of travel ceilings and associated regulatory challenges, winners may have other educational options to choose from.

ON THE JOB HUNT?
The OITE posts jobs on their website with an average of 10 new postings a week. Look to see if your dream job is available! https://www.training.nih.gov/career_services/jobs

March Events

TUESDAY, MARCH 18, 3 – 5 PM
FelCom Event: Careers in Sales and Marketing
Building 10, Masur Auditorium
Please register through OITE here: https://www.training.nih.gov/events/view/2/1320/FelCom_Event_Careers_in_Sales_and_Marketing
**Interdisciplinary Madness!**

<table>
<thead>
<tr>
<th>I work in</th>
<th>but get paid by</th>
<th>My Advisor is in</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Lab)</td>
<td>(Program)</td>
<td>(Department)</td>
</tr>
</tbody>
</table>

...but my *real* Advisor is in

(another Department)

Officially, I'm part of

(Research Center)

...even though my office is in

(Basement of another building)

Most of my classes are on

(Stuff I haven't seen since High School)

yet technically, my degree is in

(Major other than my undergrad's)

So basically, I belong

(Nowhere)

*www.phdcomics.com*