

# The steps to success

## Postdoc program at CSHL



For a majority of those who spend long days in the lab, pull all-nighters, work through weekends, and willingly sacrifice vacations in the quest to earn a Ph.D. in the life sciences, life post Ph.D. is typically...not that different. As “postdocs,” most will continue to live their lives at the lab bench, as night owls and weekend warriors for whom holidays and extreme weather events are mere glitches in a calendar crowded with experiments designed to address one of any number of challenging biomedical questions.

At any given time, CSHL is home to around a hundred and seventy postdocs. They arrive from 50 different countries, in their late ‘20s or early ‘30s, mostly by themselves but some with families, and work in one of CSHL’s 54 labs from three to five years in pursuit of the same Holy Grail: a scientific breakthrough that will give them a chance to publish papers in the journals with the highest “impact factor,” a measure of the journals’ relative importance within a given research field.

By the time they are ready to leave, most will have accomplished this goal, which is one reason why CSHL is number one in the world in publishing papers in molecular

biology and genetics that get cited most often, ranking above MIT, Rockefeller University and the Dana Farber Cancer Institute in this category. The postdocs know that authoring high-impact papers will add clout to their CVs, floating them to the top of the application pile in any science-related profession — particularly the coveted faculty positions in the rapidly shrinking pool of ivory tower jobs.

Most postdocs thus start planning for a post-CSHL career even as they begin their life on the campus. The track record of CSHL postdocs continuing on to successful careers is heartening, with most securing faculty appointments at top universities and research centers, and some advancing to such positions at CSHL itself — a prime example being President Bruce Stillman, who arrived here as a postdoc in 1979. But results of annual surveys conducted by the American Association for the Advancement of Science, the world’s largest general scientific society, justify a certain level of anxiety. Unemployment following a postdoc stint has risen from 2% in 2010 to 10% in 2012, with only 20% of postdocs securing tenure-track faculty positions in 2012.

Navigating the job market was never this difficult for the postdoctoral community. In fact, in a distant 20th century period circa the ‘80s, some with Ph.D.s could skip the postdoc part and still land a faculty job. According to CSHL’s Director of Research, Dr. David L. Spector, who comes from this era and acknowledges the challenges that postdocs face today, CSHL has all the ingredients needed to create a recipe for a successful postdoctoral experience.

“I tell postdocs to think of this experience as a unique time in their scientific lives when they are free of the responsibilities of managing a lab and competing for multiple grants,” says Spector. “They are being given a chance to mix it up with the best minds in several research arenas. So the ball is in their court now. They just have to come up with great ideas, work really hard, and encounter a little luck in the mix.”

Echoing his mentor’s philosophy, Jan Bergmann, one of Spector’s postdocs, is taking full advantage of the amenities that give CSHL’s postdocs a huge edge over their peers elsewhere. “It’s a combination of having easy access to the world’s best scientific minds and the most advanced technology,” says Bergmann, who is studying how recently discovered pieces of genetic material called long non-coding RNAs regulate the way DNA is packaged within the cell’s nucleus and how this packaging changes as stem cells mature into different cell types.

Bergmann and his colleagues are benefitting immensely from CSHL’s purchase of a cutting-edge microscopy system that tracks RNA-related events occurring within cellular nuclei in real time. “Most countries have just one of these machines; I’m fortunate to be able to use one that’s a few minutes’ walk from my lab,” he says.

Another big technological draw for the postdocs is CSHL’s Woodbury Genome Center, home to 16 high-throughput genome sequencing machines offering a broad array of genetic analysis applications that are constantly being innovated and improved upon in direct collaboration with the companies selling this technology.

In addition to the genomics hub, there are nine other “shared” scientific resource facilities that provide services ranging from breeding mice with a desired genetic profile to churning out indispensable reagents such as antibodies.

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For postdocs running on a tight schedule and an even tighter budget, it’s tremendously time-saving and cost-effective to have such facilities right on campus.

Access to the leading scientists in any given field is just as easy, often simply a matter of tracking someone down at lunch at one of the cafeterias or Blackford bar, where ideas for a new scientific front or a new technological approach are routinely hatched over coffee or other stimulating beverages. “There’s a very strong culture of collaboration between scientists who work in different labs and across different disciplines,” says Jonathan Ipsaro, a postdoc in structural biologist Leemor Joshua-Tor’s group, who has joined forces with postdoc Astrid Haase in cancer biologist Greg Hannon’s lab to make fundamental discoveries about the molecules that guide the phenomenon known as RNA silencing.

The lack of departments or other barriers “makes it easy for those who have trained in one discipline to learn new ones and think outside the box,” says Santiago Jaramillo, a computational neuroscientist whose postdoctoral work in Tony Zador’s lab is giving him “a solid foundation in experimental work in animals.”



For postdoc Kate Creasey, who is unraveling mechanisms of epigenetics in plant biologist Rob Martienssen's lab, "it's not just the in-house expertise but the chance to meet and network with the scientific leaders who come to CSHL meetings from all over the world," that has been one of the highlights of her experience here. The CSHL meetings are crucial because this is where scientific discoveries are presented as breaking news. Hearing such information right away and not after six months when the discovery is published in a paper sometimes makes all the difference to a postdoc working in a competitive field.

Besides all these tangible factors, there's "an atmosphere of excellence where it's easy to be inspired," says former Spector lab postdoc Tom Misteli, who now heads the Cell Biology of Genomes group at the National Cancer Institute. "CSHL is a place where



### Preparing for the post-postdoc life

When a group of postdocs approached President Bruce Stillman in 2010 with requests for filling in some gaps in their experience at the Laboratory, he responded with a request of his own, asking them to organize into a formal group to pursue their agenda in a systematic way. The resulting Postdoc Liaison Committee has since changed the way postdocs are perceived by and interact with the rest of the CSHL community. "We're no longer the 'shadow' people," quips Kate Creasey, one of the leaders of the committee, whose job is "to ask the sorts of questions that will bring more transparency to the way postdoc-related issues are tackled and resolved." Some of the Committee's most successful activities include the initiation of a career development series in which faculty members educate postdocs on "real life" topics such as how to negotiate for a startup package after landing a faculty position or how to hire staff for a new lab.

For those keeping their options open for a non-academic life, the postdoc-run Bioscience Enterprise Club aims to provide opportunities to learn about non-traditional science careers, develop entrepreneurial skills and network with professionals in the biotech industry, clinical research, intellectual property law and tech transfer, consulting, science education, policy and administration.

creativity is encouraged, as is the ability to take risks, think provocatively and venture outside the mainstream."

CSHL faculty takes an active role in promoting post-doctoral training with a view to improving their career prospects. Joshua-Tor, who until recently served as Dean of the Watson School of Biomedical Sciences, served on a National Institutes of Health task force that analyzed postdoc-related issues to frame a list of recommendations to improve postdocs' training and ability to forge a sustainable career. CSHL also provides its postdocs with other types of training, such as workshops on grant writing, navigating review panels and opportunities in non-academic sectors, to name a few. [see sidebar: "Preparing for the post-postdoc life"]

"Most of those who come here have already made headway into accomplishing many of the things they need in order to achieve their career goals," says Ipsaro. Wherever he and his peers land in the next stage in their careers, they will all do so with a nearly identical reflection on their CSHL experience. As Astrid Haase puts it, "the thought that we're pushing science further and doing things that make our work useful to the community for a long time makes the postdoc experience, with all its challenges, completely worthwhile."

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