At first, there seemed to be plenty of entry-level faculty openings for a young neuroscientist like Farran Briggs, Ph.D. It was 2008, and Briggs was in the fifth year of a postdoctoral fellowship, studying neuronal circuits in the early visual system of mammals. She had already coauthored several papers in reputable neuroscience journals and had been able to secure funding during her entire fellowship—and even for graduate school. Her career seemed poised to take off.

But as the U.S. financial system collapsed during the fall of 2008, universities began pulling their ads for faculty positions, Briggs recalls. “More than half of the job ads that were posted were withdrawn after Lehman Brothers filed for bankruptcy,” she says, adding that “2008 was a very interesting year to get my feet wet.”

In order to land a job as an assistant professor at a top research university, Briggs figured, she’d have to prove that she was the best candidate out there in her specialty—even though she knew that many talented postdocs in her field were already on the market and many more were coming up behind her.

“You get in the back of the line of these incredible applicants, and everyone is fighting for like five positions in the country,” Briggs says. “It’s kind of insane!”

Another sign of the times is the declining rate of approval for grants with a single researcher as the lead investigator (known as R01 or R01-equivalent grants). In 2001, the success rate for original NIH R01 or equivalent applications was 25%. By 2008, that rate had fallen to 8%, though it did rise slightly, to 10%, in 2010.

Federal government—hasn’t seen a major budget increase since 2003. As a result, it has become harder and harder to secure NIH funding, certainly for new researchers and even for experienced ones, and thus harder for institutions to hire new research faculty. New faculty often need a few years of start-up funding to get their labs going, but since institutions’ endowments shrank in 2008, it’s been tougher for them to come up with those funds.

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For a young scientist like Briggs, who is just starting out and who has learned to regard R01 grants as a significant measure of research success, those odds are daunting. Concerned about the challenge, but undeterred, Briggs “made a big push” near the end of her training, she says, and got an important paper published in a
It really is trial by fire,” observes Briggs, who is now several months into making that transition. “You can try to pick the brain of your advisors as best you can. I certainly did.” But, she adds, “You can’t necessarily prepare for everything. . . . You just sort of dive in and do it.”

Ten years ago, James DiRenzo, Ph.D., an associate professor of pharmacology and toxicology at DMS, was where Briggs is now—just starting out as an assistant professor at DMS. Economic times were better and funding was easier to come by. Even so, the growing pains of trying to figure out how to be a successful independent investigator were as real then as they are now.

“When it came to the actual process of establishing myself as an independent investigator,” says DiRenzo, “99% of the mentoring I received, I received here.” And most of that mentoring came from the chair of his department, Ethan Dmitrovsky, M.D., the Andrew G. Wallace Professor of Pharmacology and Toxicology.

Dmitrovsky doted on advice on how to set up a lab, how to hire and manage staff, how quickly to grow the lab, what grants to apply for, and much more, says DiRenzo.

One thing DiRenzo learned “absolutely nothing about” during graduate school and his postdoctoral fellowship, he admits, was managing people. There were opportunities to learn those things, he says, but he was always so focused on conducting the research that he passed up those chances.

Hiring and managing a laboratory staff “is very hard,” he soon realized. “You’re not simply hiring a scientist or simply accepting a trainee into your lab. You’re becoming involved with another person and a person who has all these other sorts of interests and issues.” Most of all, when an independent investigator takes on a student or a postdoc, that investigator is signing up to be a mentor and advisor for the young scientist. “It’s a great responsibility, but also a great joy for many investigators.”

“The thing I probably most enjoy is watching the maturation process,” says DiRenzo, “when you see students . . . hit that level of independence where they’re already making the right calls for themselves.”

Good mentoring is widely acknowledged as essential for graduate students and postdoctoral fellows, but it’s also critical for junior faculty.

“One pearl of wisdom that Dmitrovsky shared with DiRenzo, who studies normal and cancerous stem cells in the breast, was to not be in a rush to apply for R01s,” says DiRenzo. “The problem is that for most people their first R01 gets [them] four years of funding, sometimes [only] three,” says DiRenzo. “To bring in further sup-

Yeh. “Our department is very diverse,” says Yeh. “It was actually Farran's job to make her research directions and programs clear enough so that somebody who is not in her immediate field can understand and get interested in it.”

Finding the right candidate is “not just a simple matter of looking at the CVs and counting the papers or number of grants” a person has, explains Yeh. “Our department takes teaching very seriously. We put the same kind of emphasis on whether we think the person has the ability to stand in front of medical students and explain clearly some fairly difficult concepts and principles.”

It was Briggs’s chalk talk, Yeh says, that ultimately made her rise to the top of the applicant pool (and the same was true of Bryan Luskov, Ph.D., another neuroscientist whom Yeh recently recruited).

Briggs will do some teaching during her first few years at DMS, but her primary focus right now is on setting up her lab and getting established as a researcher. That’s no small task. Making the transition from postdoc to independent investigator is perhaps the steepest learning curve along a scientist’s career path. In one step, Briggs went from being one of many subordinate researchers in a lab run by someone else, to having a long list of responsibilities, not the least of which is hiring and managing a laboratory staff.

“It really is trial by fire,” observes Briggs, who is now several months into making that transition. “You can try to pick the brain of your advisors as best you can. I certainly did.” But, she adds, “You can’t necessarily prepare for everything. . . . You just sort of dive in and do it.”

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port, investigators have to submit an application for a grant renewal, which includes describing what they’ve accomplished in the first round of funding. “As you’re starting a lab,” he says, “that two- to three-year period . . . simply isn’t long enough to really get yourself established.”

A nother reason for DiRenzo to hold off on chasing his first R01, Dmitrovsky advised him, is that many private foundations that support cancer research specifically target young investigators. This is especially true in the breast cancer arena.

The strategy worked well for DiRenzo. He garnered support from several private foundations during his first decade at Dartmouth, including the V Foundation for Cancer Research, the Mary Kay Ash Charitable Foundation, the Susan G. Komen Breast Cancer Foundation, and the Elsa Pande Foundation. He’s only this year nearing the end of his first R01 grant, and he’s optimistic about his chances for renewal.

Still, even now, in the middle of his career, DiRenzo says he has no shortage of questions for Dmitrovsky. “I was very fortunate to have a chair who believed strongly in the mentoring aspect” of his role, says DiRenzo. “It made a big difference, that’s for sure.”

Duane Compton, Ph.D., DMS’s senior associate dean for research, agrees. “Junior faculty success can almost be one-to-one correlated with the amount of mentoring—the time and quality of mentoring—that they get,” says Compton, a biochemist.

That’s why he and others at DMS are looking at ways to match junior faculty with senior faculty whose research is in a similar field and who have the time and willingness to mentor a young investigator. Often the chair of a department is able to fill this role, as was the case with Dmitrovsky and DiRenzo. Likewise, Briggs frequently turns to her chair, Yeh, for advice on such matters as writing a budget and hiring lab staff.

But, as DMS Dean Wiley “Chip” Souba, M.D., Sc.D. points out, the chair of a department “can’t do it all alone,” and there may be other senior faculty who know more about a given junior faculty member’s line of research. For those and other reasons, it’s important to have ways to link junior faculty to senior faculty, not just within departments but also among different departments and across the whole institution.

In addition to mentoring, part of supporting new research faculty, points out Souba, is making sure that they have good lab space and a sizable start-up package that will fund their salary and research expenses—which range from technicians, postdocs, and graduate students to research animals, equipment, and supplies—for a few years.

After five years, junior faculty should have been able to secure their own funding, but many achieve that goal sooner. And sometimes, new faculty members arrive at DMS with their own start-up money, like Briggs’s K99/R00 award.

DMS is currently recruiting junior scientists in several key areas, such as cancer, neuroscience, lung biology, inflammation, biostatistics, and bioinformatics. To aid in recruiting and supporting new faculty, DMS is also focusing on getting more so-called “mega-grants.” These are multimillion-dollar awards that go to teams of investigators rather than to individuals. They can be used in a variety of ways to support junior faculty, as well as senior faculty and young scientists still in training.

For example, DMS computational geneticist Jason Moore, Ph.D., is overseeing a recent $11-million grant from the NIH to assist a network of northern New England institutions in recruiting, training, and supporting young quantitative biologists. Moore, the Third Century Professor of Genetics and of Community and Family Medicine, says that the grant will encourage junior faculty to examine different aspects of the way genes and environment interact in causing or preventing diseases.

Other DMS-led mega-grants secured in recent years include a $6-million renewal from the NIH for immunological research; a $13.5-million renewal from the NIH for lung disease research; and a $29.8-million U.S. Department of Health and Human Services grant to develop readily deployable devices that can measure levels of radiation in survivors of radiological and nuclear catastrophes.

Mega-grants, says Souba, act as magnets, attracting the best young scientists, postdoctoral fellows, and graduate students to an institution.

The increasing focus on team science and mega-grants is not unique to DMS, but “the willingness to collaborate and work as a team” is unusually high at Dartmouth, says Souba, who arrived at DMS a year ago. That’s a message that Souba delivered directly to Farran Briggs, when he met with her recently.

“People are very open to collaborate at DMS,” he told her. “You can call them up and they’ll say, ‘Oh, yeah, let’s get a cup of coffee.’ And that’s so critical for a young person like yourself.”

Briggs had already found that to be true. “Within a few weeks of being here,” she told the dean, “I was already selected to be a part of three other grant proposals.”

Although DMS faculty may seem less concerned with who’s going to get the credit for a research...
“Not everybody can be an investigator,” says Green, who holds DMS’s Raymond Sobel Professorship of Psychiatry. “What it takes is what scientists tend to call ‘fire in the belly’. . . You have to be willing to submit things that get turned down . . . to keep batting your head against the wall a little bit."

When Green began his career in research, in the early 1980s, he had just finished his clinical training in psychiatry, and research funding was nearly as tight as it is today. But he was determined to find a way to both practice psychiatry and conduct research. At first, he applied for and received some small grants and collaborated with others on their grants. It was several years before he got his first R01, and his application wasn’t even accepted on its first submission. The NIH review committee ranked it very favorably—in the 12th percentile—but it still didn’t make the cut its first time around.

“Not everybody can be an investigator,” says Green, who holds DMS’s Raymond Sobel Professorship of Psychiatry. “What it takes is what scientists tend to call ‘fire in the belly’. . . You have to be willing to submit things that get turned down and not get offended, not get disappointed, or not lose hope because the competition is extremely tight. And you have to be willing to keep batting your head against the wall a little bit, until you figure out how to do this and . . . get good at it.”

Green learned how to “get good” at research from one of his mentors, Joseph Schildkraut, M.D., a Harvard psychiatrist and physician-researcher. “He used to say to me,” recalls Green, that “at that point in his career, my career was more important to him than his own career. So he was willing to read what I put out and critique it and give me ideas . . . point out problems that he saw in it.”

Since a mentor has to be willing to put the interests of the junior person first, says Green, it’s not always easy to find someone willing to do that. That’s one of many reasons that Green is leading the new Dartmouth Center for Clinical and Translational Science, dubbed SYNERGY.

SYNERGY aims to provide resources, technologies, training, and expertise to scientists working in clinical and translational research at Dartmouth. It has already made more than two dozen pilot grants to DMS translational scientists since 2008. In 2011, SYNERGY launched the Mentored Career Development Program and named two SYNERGY Scholars: Auden McClure, M.D., an assistant professor of pediatrics, and Matthew Havrda, Ph.D., an instructor in pediatrics. As SYNERGY Scholars, McClure and Havrda are matched with at least two senior scientists who oversee their progress in developing their own translational research programs. The award also covers 75% of their salaries and provides funding for research assistants, supplies, and tuition expenses.

The Hitchcock Foundation, an internal Dartmouth-Hitchcock research funding organization, continues on page 59
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also has a program that funds junior investigators who do clinically oriented research.

“To be a top-rate academic institution,” says Green, “we need to be able to provide opportunities for our brightest junior people.” Those opportunities can then launch them to the next level—securing outside funding for clinical translational research.

Jim DiRenzo agrees. As the scientific director of the Comprehensive Breast Program at Dartmouth’s Norris Cotton Cancer Center, he serves as a conduit between clinicians and basic scientists who are conducting breast cancer research.

“Translational research is so hard and it’s so multidisciplinary that any mentorship that you can get is of value,” says DiRenzo. “It’s one thing to say, ‘I know how to operate my lab and I know which research questions I think are interesting.’ But it’s “much more demanding” to do research involving many different specialists—such as clinicians, epidemiologists, statisticians, and pathologists.

Succeeding as a translational researcher can be even more difficult if you’ve got a full or nearly full clinical schedule, which is often the case for physician-scientists. Carving out the time for research has always been a struggle for practicing physicians.

For over 20 years, Dean Souba was a practicing cancer surgeon and a scientific investigator, researching amino acid metabolism. So he understands the competing demands of the clinic and the laboratory. But times were different when he was starting out, Souba admits. “I came up at a time when the pressure or the mandate to produce clinically was not as great,” he says.

Today, because of declining reimbursements from governmental and private payers, physicians are under enormous pressure to see as many patients as possible to bring in more revenue. But “to do science,” says Souba, “you’ve got to have time. So part of our strategy going forward is to create time—not for everybody, but for select people.” (Giving faculty protected time, free of clinical responsibilities, applies not only to research faculty, Souba adds. It also applies to those focused on teaching.)

“People usually come to an academic medical center because they want to do more than just take care of patients,” Souba says. So figuring out how much time a physician-scientist is going to spend seeing patients versus doing research is part of recruitment negotiations. Many clinical departments at DMS have funds to support physician-scientists when they’re doing research and not seeing patients. For example, Green established such funds in psychiatry some years ago.

To be sure, having protected time, good mentors, and collaborative colleagues are all key to developing a successful research career. But in the end—and no matter whether a researcher has an M.D., a Ph.D., or both—those elements are secondary to a far less tangible attribute. Green calls it “fire in the belly.” DiRenzo calls it persistence.

“Of course you have to be smart,” says DiRenzo, “but there are lots and lots of very smart people. The ones who are really successful are persistent.”

That’s heartening to a young scientist like Farran Briggs. She may shrug off her tenacity as “just a part of being a PI.” But she clearly knows how to set a goal and pursue it.

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