You spent more than a decade training to become a researcher, then several more years getting yourself established in your scientific field. Getting where you are has taken years of hard work, insecurity, and personal sacrifice.

You realize that the place where you are professionally isn’t quite where you want to be? What do you do if, after all those years of hard work, you find yourself uninspired by your science? Worse, what if your colleagues—even peer reviewers—are? What if new developments in science or your personal life, or new scientific insights, point you toward exciting opportunities in a new field?

**Radical shift**

“If things get bad enough, in a sense it opens you up to try stuff because you have nothing to lose.” — Amishi Jha

So what if one day you realize that the place where you are professionally isn’t quite where you want to be? What do you do if, after all those years of hard work, you find yourself uninspired by your science? Worse, what if your colleagues—even peer reviewers—are? What if new developments in science or your personal life, or new scientific insights, point you toward exciting opportunities in a new field?

The hardest step in reinvigorating a career is often the decision to do it. Inertia can be strong. “Too often, people know they’re not in the right place but simply go on from day to day, either hoping things will get better or because change is often a bit too frightening,” says developmental biologist Harley McAdams of Stanford University School of Medicine in California. Often, it takes a precipitating event—a failed grant, a family crisis, a major recession—to force a decision. “It’s a question of being reactive or proactive,” McAdams says. “Proactive is better.”
McAdams should know. Trained in low-temperature and atomic physics in the 1960s, he spent decades in industry, first at Bell Laboratories in Murray Hill, New Jersey, where he was a department head for almost 20 years, and later at Lockheed Missile and Space Co.—now part of Lockheed Martin—in Sunnyvale, California, where he moved when his wife, microbiologist Lucy Shapiro, took a job at Stanford University in 1989.

By the mid-1990s, McAdams sensed that his work in systems engineering at Lockheed wasn't taking him anywhere. He had developed an amateur interest in biology; his formal biology education was limited to a smattering of graduate courses, but he had followed Shapiro's work closely, puzzling over scientific questions with her.

In time, McAdams developed some biology questions of his own. His expertise in electrical engineering and control systems led him to think that biochemically based genetic circuits must be analogous to the electrical switching circuits he knew well. McAdams quit his job. Supported by part-time consulting work and Shapiro's salary, he spent a year reading the literature and learning microbiology. In 1995, he and Shapiro published a paper in *Science* in which they presented their new ideas. The paper got the attention of scientists at the Office of Naval Research University of California, Berkeley. "That collaboration was invaluable, since Adam and I together came up with insights that neither of us would have thought of on our own," McAdams says.

In 1998, after publishing several influential papers, McAdams accepted a job at Stanford as a staff scientist. In 2002, he joined the faculty of Stanford's School of Medicine, where he is now a full professor of developmental biology. McAdams's unconventional career path is "not one that lays out a blueprint for others," he says, except in that it reinforces "the idea that you should follow your muse."

### A career-changing sabbatical

When radiation biologist Timothy Jorgensen of Georgetown University in Washington, D.C., realized his work was stalling, he decided nevertheless to keep his job as he redirected his scientific work.

Until he was in his late 40s, Jorgensen had studied ways to modify tumor cells genetically to make them more vulnerable to ionizing radiation. The goal was to develop better cancer therapies, but the results were disappointing. Genetic studies were showing that tumors outsmart radiation by deploying backup programs to keep DNA intact when normal cell signaling is disrupted.

Attracted to new genetic tools that could, for the first time, address questions about cancer susceptibility, he set himself a new goal: to study how genetic differences in cellular DNA repair affect people's risk of getting cancer in the first place. Jorgensen began talking with cancer epidemiologists.

He quickly got stuck. "Their perspective on the laboratory science was completely different than my perspective," Jorgensen recalls. "We didn't even speak the same language. Their definition of a mutation wasn't even the same as mine. I decided that if I was going to work in this area, I had to learn the language of molecular epidemiology."
In 2003, Jorgensen applied for and received a National Institutes of Health (NIH) Senior Fellow (F33) Award from the National Cancer Institute. F33 grants are intended to be training fellowships for senior scientists who want to change directions or broaden their research capabilities. In Jorgensen’s case, the grant funded a 1-year sabbatical at Johns Hopkins University in Baltimore, Maryland. Working with Johns Hopkins cancer epidemiologist Kathy Helzlsouer, Jorgensen investigated the association between mutations in DNA repair genes and breast cancer risk in a large population of women, each with a family history of breast cancer. At the same time, he worked toward a master’s degree in public health from Johns Hopkins, which was awarded in 2005, when he was 49 years old.

The biggest challenge, Jorgensen says, was structuring the change so that it didn’t throw his family life out of balance. “I could have pursued my change more aggressively, and this would have shortened the transition process,” he says, “but it also would have shifted more family burdens to my wife and cost my children time with their dad.”

Today, having adapted his lab to study biomarkers for cancer risk, Jorgensen does genetic epidemiology almost exclusively, mostly in collaboration with scientists who study DNA repair genes but have too little molecular knowledge to interpret the associations with disease. His papers are published in top journals. “The process took much longer than I thought it would, but it was a successful trip,” he says.

Reentering academe

When M. Cameron Hay was finishing her Ph.D. in medical and psychological anthropology at Emory University in 1998, she was offered a tenure-track job—but in a city that offered no professional opportunities for her husband. Hay and her husband had spent five of the first 7 years of their marriage separated geographically while she pursued her Ph.D. and did fieldwork in Indonesia. “This commuter marriage wasn’t much fun,” Hay says, “but it allowed both of us to pursue our careers.”

But now they were expecting a baby. Living apart was out of the question. Hay’s husband earned more than twice what her starting tenure-track position would pay. “Starting a family with a 50% cut in income and a job change for him simply didn’t seem wise,” Hay says. Hay turned down the faculty offer “with angst but also with a very strong sense that I needed to prioritize family as well as my husband’s career.”

During the next couple of years, she published her dissertation, a study of illness and healing practices on the Indonesian island of Lombok. But mostly, she focused on her growing family. Four years after leaving academia, she was ready to go back. “Toward the end of the time with my kids, I was intensely anxious about whether I would be able to find a path back into academia.” Hay says. In hindsight, she says, some of her worries were unwarranted: “Getting back on the academic path was made easier by a handful of amazing mentors who encouraged me, wrote letters of recommendation on my behalf, and read and commented on drafts of papers and chapters.”

She found a fellowship through the National Science Foundation’s (NSF’s) ADVANCE Fellows program. Hay’s fellowship, together with supplemental funding from the National Multiple Sclerosis Society, supported a 3-year postdoc at the University of California, Los Angeles (UCLA), Center for Culture and Health. “I felt like the NSF grant was sort of my one shot,” Hay says. “I couldn’t let that opportunity be unsuccessful.”

Hay’s postdoc work, studying how access to online health information affects doctor-patient relationships, dovetailed with her work in Indonesia in that both projects focused on how the social distribution of medical knowledge shapes people’s experiences with illness. Landing a postdoc in the United States presented several advantages, Hay says. Her husband’s position at the time wasn’t mobile, and dividing up the family for the sake of her research was undesirable. It was, furthermore, “unnecessary given that, as an anthropologist, I study people, and people are interesting everywhere,” Hay says.

Furthermore, whereas Hay’s earlier training had been in the traditional, lone-anthropologist-in-the-field model of ethnographic research, her U.S.-based postdoc gave her an opportunity to work on an interdisciplinary research team for the first time, as well as to develop her teaching skills. Participating in a reading group for anthropology faculty members and graduate students also afforded her time to reconnect with current scholarship.

After 3 years at UCLA, Hay took a position as an assistant professor of anthropology at Miami University in Oxford, Ohio, where she will go up for tenure this year. She also maintains a position as an assistant research anthropologist at UCLA, where she has active research projects and colleagues. Being affiliated with both a major research university and a large liberal arts university feels like “the best of both worlds,” Hay says. “I really feel like I won the lottery.”
A look within revives scientific zeal

University of Pennsylvania cognitive neuroscientist Amishi Jha found career renewal not through a formal program but in a last-ditch effort to make her research both rewarding and successful. As a young professor trying to keep a lab running, write grants, prep several courses a year, and raise a young child, Jha knew that stress was a part of her job. But 2 years into her faculty post, her interest in the neural bases of attention and working memory, a subject she had been studying for years, was flagging.

What’s more, the kinds of mechanistic studies she was doing were far from the translational approaches that federal funders in her area were seeking. She found herself competing with her own mentors for an ever-smaller pot of money. After a grant application fared poorly, Jha’s program officer at NIH suggested she pursue something else. “I felt completely lost,” Jha says. “This was the only thing I knew how to do.”

Yet it was obvious something had to change. “The stress had whittled me to the point where I didn’t have feeling in my teeth anymore, from grinding if the saying goes,” Jha says. As a last resort, she decided to give herself the summer to see if she could shake the boredom and fogginess that had overtaken her and her work. “At the moment where I felt the most depleted and disheartened,” Jha now realizes, “I didn’t have access to that creativity.” Open to anything that might help, she bought a book on meditation for beginners. Six weeks into her meditation practice, Jha says, “it really was like a light bulb going off. Everything was clearer. I could feel my teeth again. And I realized I could research this.”

Her scholarly interest shifted to how stress erodes the brain’s ability to concentrate and what processes enable a person to strengthen attentional capacity. Very few scientists were studying how mindfulness training affects attention at the neural level, as she now wanted to. For the rest of that summer, Jha holed up at home to read everything she could find on mindfulness meditation and attention training. She applied successfully for an NIH (R21) pilot grant to study how meditation affects the brain mechanisms involved in attention.

“If things get bad enough, in a sense it opens you up to try stuff because you have nothing to lose,” Jha says. “I had found something that totally captivated me as a content area. I at least had to check it out.” She was fortunate, she observes, in that her colleagues in her department encouraged her to pursue her new interests, even if it meant that the rate at which she published might briefly slow.

In a 2007 study, she and collaborator Michael Baime, a University of Pennsylvania physician who runs the Penn Program for Stress Management, found that mindfulness meditation strengthened participants’ attentional capacity. That research led to Jha’s being awarded two separate $1 million Department of Defense grants to study mindfulness training in soldiers, research that is now under way. She was recently invited to brief members of Congress on the research, and this spring, during meetings that brought cognitive scientist and Buddhist scholars together, she discussed her research with the Dalai Lama.

Jha says her renewed enthusiasm for her research has also transformed her teaching. This spring, she won a teaching award for her upper-level undergraduate course on the cognitive neuroscience of meditation. “It’s been a completely crazy adventure,” Jha says, adding, “The pressure is just as high as it always was, but I feel completely committed to doing what I’m doing because I’m fascinated.”

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