

CAREERS

INTERVENTION Why PIs must recognize and support trainees with depression **p.433**

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CHRIS ENSOLL



Clinical psychologist Kate Baecher has combined her love of mountaineering with scientific expertise to study risk, fear and survival among mountain athletes.

INTERDISCIPLINARY RESEARCH

Turning a passion into a job

Outside pursuits needn't be just side gigs. Scientists are fusing disciplines to form new fields.

BY EMILY SOHN

Indre Viskontas took piano lessons as a child and made her opera debut at age 11. But her mother, a professional conductor, told her that music did not pay well. So Viskontas, who often listened to the opera singer Maria Callas while doing homework, decided to pursue science instead, earning an undergraduate degree in psychology and French literature at the University of Toronto, Canada, and a PhD in cognitive neuroscience at the University of California, Los Angeles. During a year in London, she took singing lessons that she continued during her PhD, when she also sang opera.

Viskontas saw neuroscience as a stable career choice that might offer ideas about how to better embody roles in operatic performances. But after years of alternating her focus between

science and music, she found a way to combine the two, by applying neuroscience to musical training. She now works as an opera singer and cognitive neuroscientist, with positions at the University of San Francisco, California, and the San Francisco Conservatory of Music.

Scientists who have successfully crafted a research career out of their non-academic passions and talents say that persistence and patience are key, especially when trying to merge two professional paths that might not seem obviously connected. Melding worlds can be unsettling, and it takes time and creativity to persuade funders and advisers that the work is worthwhile.

But those who have done so say that focusing a research lens on their life's passions has expanded both their personal horizons and scientific goals in an academic landscape that

is becoming increasingly interdisciplinary. Viskontas' research projects include teaching people with cochlear implants how to sing. "My life is like this DNA double helix constantly turning itself over," says Viskontas, adding that she has noticed a drive towards innovative solutions in science and a demand for a more scientific approach in the arts. "I feel like I'm a bridge between these worlds. And we are entering an era where that overlap is more celebrated."

FORGING A PATH

It often takes perseverance to find ways to study one's personal interests, especially if those interests don't already belong to established research departments, says Vanesa España-Romero, an exercise physiologist at the University of Cádiz in Spain. She got hooked on rock climbing while she was at school ▶

► and chose to pursue sports science, partly as a way to learn how to be a better climber.

But when she began studying elements of climbing fitness for her PhD, such as handgrip strength and percentage of body fat, nobody else in Spain was studying the sport. She had to create tools and formulas while explaining what she was doing to colleagues and supervisors. Funding was impossible to get, she adds, because grant providers didn't understand climbing or see any reason to study it. "People felt I was doing something weird," she says.

Instead of giving up, España-Romero recommends, go for long-term thinking and creative strategies for forging new research paths. She sought funding for research into the promotion of physical activity and health. Then, she applied existing research tools to her climbing studies. It's a strategy she still uses, although increasing interest in the sport has made it possible for her to get a little money for climbing-specific studies. "I think the key thing for me was the persistence," she says. "If you love what you do, go for it. But you need time."

During the time it can take to work out how to combine science with an outside interest, it might be necessary to pursue both in tandem. Good organizational skills can help researchers to juggle two identities at once, says neuroscientist Peter Vuust, who is director of the Center for Music in the Brain at Aarhus University in Denmark. He also teaches music at the Royal Academy of Music in Aarhus, and is a bassist. His research addresses questions about how the brain processes music, with projects such as the use of music in health care.

Vuust started playing music professionally when he was 16, but studied French and music as an undergraduate, mathematics for his master's degree and neuroscience for his PhD. Even now, as a working scientist, Vuust plays music every morning at 6:30 for up to an hour and a half. It's meditative time for him that helps him to maintain a performance schedule of 60 concerts a year.

To keep side interests alive while working towards a science degree, Viskontas recommends being strategic about institutes and supervisors. She sought advisers who were supportive of students who follow outside interests and maintain strong publication records. She stuck with a supervisor who allowed her to work whatever hours she wanted. Another mentor attended her musical performances, and asked about her music before asking about her data.

FINDING FUNDING

A strategic approach also applies to funding, Viskontas says. To pursue her music while studying neuroscience without objections from her graduate-programme leaders, she spent a lot of time researching and applying for independent grants. Her search included family foundations and opportunities that were aimed at highly specific groups. She received one award for scientists who were pursuing extracurricular activities. The approach allowed her to self-fund her PhD, giving her financial independence from her institution, and the ability to take a break from her PhD for up to one month each summer. During that time off, she performed in operas in locations such as Italy and Canada. "I would go through literally hundreds of scholarships and grant opportunities," she says. "Then I would send a letter to them and say, 'Hey, I'm studying this really fascinating thing.' You can target your letter to fit the foundation's mission."

Vuust took a different approach to the same need for freedom. For two years, he worked every day on applying for a major grant from the Danish National Research Foundation, which is given to about ten scientists once every three years. He didn't get it, and had to rely instead on smaller grants. In 2014, with a polished application, he got the grant, allowing him to focus on his research and his music without worrying too much about the need to constantly seek more money.

Enduring a long wait before finding a way

to combine science with other interests isn't necessarily a bad thing, adds Kate Baecher, an independent clinical and performance psychologist in Sydney, Australia. For years, she focused her research on trauma among veterans, while pursuing a love for mountaineering in her own time. Only in the past year or two has she begun to study risk, fear and survival among mountain athletes on expeditions. Combining her scientific expertise with her love of mountains made sense only after she had established herself as a psychologist and developed the skills to ask and address questions she wanted to answer. "I wouldn't have been ready to do it at the beginning of my career,

"I saw a way in which my neuroscience training could benefit musicians."

when I was still learning," she says. "Now, I have the professional and personal maturity to tackle it."

To avoid burnout, Baecher recommends drawing clear boundaries between work and play hours. She still climbs mountains with friends, purely for the joy of it, including a month-long trip earlier this year to Pakistan. And she pursues research projects that have nothing to do with mountaineering. "Professional balance is really important," she says.

MERGING SCIENCE AND THE ARTS

Insecurities can grow while trying to combine two disparate identities, but pay-offs often emerge down the line. Now that Vuust has embraced both music and neuroscience, he feels more confident in his music, because there is less at stake. "When I got a career as a brain scientist, that gave me two legs to stand on," he says. "If I didn't play as well in a certain gig, that didn't bother me as much as it used to."

Some scientists find that studying their passions can enhance performance. Using her work, España-Romero is now able to apply evidence-based performance strategies to climbing, and she helps other climbers to do the same. When her muscles are under strain during a climb, for example, she is able to assess how many seconds of rest are needed before making another move. In 2014, Vuust received his first nomination for a Danish Music Award for an album that incorporated insights from his brain research to achieve maximum emotional impact in listeners. At a key moment in the title song, he used a melody note and an unexpected minor chord to coincide with a crucial word, hoping to tap into the brain's system of musical prediction. "To me, it really sounds like opening the window and feeling the wind blowing from a cold November day," he says. "The idea is to musically emphasize the emotions related to coming of winter."

Pursuing both science and outside interests can also lead to new discoveries and ideas, says Viskontas. After finishing her neuroscience PhD, she chose to do a graduate degree in music. As she studied and practised, she began to recognize misconceptions in conventional



Danish neuroscientist Peter Vuust heads a lab, teaches music and plays his bass in 60 concerts a year.

MADS BLOERN CHRISTIANSEN

practice methods, including a reliance on long hours of rote learning. Instead, her understanding of memory in the brain suggested that shorter but more varied sessions would challenge the brain to learn faster. The realization opened up a new career path, combining science with music. “All of a sudden, I saw a way in which my neuroscience training could benefit musicians and still be interesting to me,” she says, adding that she now accomplishes in a 30-minute practice session what used to require 4–8 hours of work. “I could hack my practice time with neuroscience.”

Turning a scientific lens onto outside interests sometimes helps to create new fields of science. Emma Redding began her career as a contemporary dancer and later started teaching, which led to an interest in how training methods could help dancers to meet the high physical demands of dancing. But when she did a master’s in sports science, she had to learn about the biomechanics and physiology of sports such as rugby and football. There was no one to teach her about dance. In 2000, she wrote the first master’s degree on dance science.

Now head of dance science at Trinity Laban Conservatoire of Music and Dance in London, where 25 graduate students enrol each year, Redding has watched the field grow to include as many as 10 undergraduate and graduate dance-science programmes around the United States and Europe. But her choice to merge science and dance required a leap of faith, and she still faces scepticism from people who think that dance is an art form that doesn’t belong in the realm of science. “I suppose I was attempting to study something that didn’t exist,” she says. “That’s why I had to start with it as an interest or hobby. Then when I got qualifications in science, I was able to start trying to develop the field.”

Studying one’s passion can lead to new opportunities, Viskontas adds. She has been using her performance skills to communicate science through online lectures and as host of two podcasts and a television series. In addition to neuroscience research, she works on a couple of musical projects a year, including an upcoming performance of a psychological thriller with a feminist twist that is being written for her voice. This year, she directed a version of an opera called *The Man who Mistook his Wife for a Hat*, based on an essay by the late neurologist Oliver Sacks, who was once her mentor.

Researching any type of science requires intense dedication and energy, Vuust says, adding that the best scientists are those who study what they love. “In order to be a really good researcher, it has to be a passion,” he says. “What you do has to be fun.” ■

Emily Sohn is a freelance journalist in Minneapolis, Minnesota.

COLUMN

Lab listener

James Turner extols the value of mental-health first aid.

The Francis Crick Institute in London now has around 40 accredited mental-health first aiders. The two-day training course is run by our occupational-health nurse, covering conditions such as anxiety, depression, eating disorders and psychosis.

I volunteered because there weren’t yet any scientific group leaders among the first aiders. We should have them at all levels of the organization, and managers should be exemplars. Like anyone else, we experience mental-health problems. I had them in the past, and my experience taught me that things can deteriorate quickly — and that early intervention is key.

I studied psychiatry during my medical degree. We focused on diagnosis and therapy, but there was less emphasis on listening skills.

COURSE BASICS

The Crick’s training course teaches you to listen in a non-judgemental way, to pay attention to negative signs and not be afraid of asking difficult questions, such as, “How are you? I’ve noticed you’re not quite yourself.” One point made during the training that isn’t always captured in textbooks is that two people can experience the same mental illness very differently. Another is that recovery is possible, but you have to give it time.

There’s also a strong emphasis on using the right terminology and avoiding inappropriate language. The phrase “committing suicide”, for example, implies that someone has performed a crime. “Completing suicide” or “taking one’s own life” are more appropriate.

The Crick’s mental-health first-aid network started in 2016 when the institute opened. At first, most volunteers were women. It took a while to get men on board, but now the network has equal numbers. Diverse representation is important because some mental-health conditions affect men and women differently. For example, in the United Kingdom, three-quarters of people that complete suicide are men, according to the Samaritans’ 2018 Suicide Statistics Report (see go.nature.com/2rpp8du). I work on sex differences as part of my research, and so find that statistic interesting. I hope that by making more men aware of and engaged in these initiatives, we might understand why they’re less likely than women to self-report mental-health issues.

My advice to someone with a mental-health problem is to remember that you are one of many going through this. The World Health Organization notes that one in four people



globally will be affected at some point in their lives. But don’t accept it as the norm.

The help we offer is confidential. Our contact details are available on our intranet and on notice boards throughout the building. We are ‘signposters’, there to listen, not to judge, and to refer people to an appropriate service. This could be their own general practitioner, or Health Assured — the Crick’s external-assistance-programme provider. External charity organizations, such as Samaritans, Mind and SANE, offer more sources of support.

The first aiders use a WhatsApp group to communicate and support each other. There is also a group debriefing session every eight weeks, and the Crick offers half-day courses to help individual employees look after their own mental health and to manage stress more effectively.

WORKPLACE CULTURE

Academic science is a fantastic but challenging career choice. Competition for jobs is huge, expectations from scientific journals are high and a scientist’s role is ever-changing. Alongside research, we teach, raise funds and engage with the public and the media. Juggling these responsibilities can be tough.

Some scientists say that stress is part of the job, and wear it like a badge of honour. I want to debunk that myth. Mentoring schemes and health-awareness events, which we have at the Crick can provide scientists with day-to-day support. We senior scientists should also coach trainees on how to cope with the pressures of a research environment. I strongly believe that with great mental health comes great science. We should all get on board with this message. ■

James Turner is a senior group leader at the Francis Crick Institute in London, where he runs the Sex Chromosome Biology Lab.