

# CAREERS

**COLUMN** A passion for science can have some undesirable consequences **p.431**

**CAREERS BLOG** News and discussion on research jobs [go.nature.com/z8g4a7](http://go.nature.com/z8g4a7)

**NATUREJOBS** For the latest career listings and advice [www.naturejobs.com](http://www.naturejobs.com)

S. YAKOV/SHUTTERSTOCK



LIFE SCIENCES

## All jazzed up

*Bioscience is thriving in New Orleans as the city bounces back from multiple disasters.*

BY AMANDA MASCARELLI

In New Orleans, Louisiana, in 2009, three men hatched a plan to start a business. One man, Mark Heiman, was then a chief scientific officer at pharmaceutical company Eli Lilly, based in Indianapolis, Indiana; another, Dale Pfof, was a serial biotechnology entrepreneur; and the third, John Elstrott, was a professor of entrepreneurship at Tulane University in New Orleans and chair of Whole Foods Market, a natural-foods supermarket chain based in Austin, Texas. Their meeting led to the creation in 2010 of New Orleans biotechnology start-up NuMe Health, which develops food compounds that promote the growth of healthy microbes in the gut. The founders attribute the partnership's creation not only to the pooling of their respective strengths, but also, says Heiman, to "the magic" of New Orleans: the city's innovative spirit, already known to inspire greatness in food and music.

Increasingly, bioscience researchers are trying to capture the same inspiration.

This bioscience renaissance is powered by a programme of investment by the state and federal governments and by the private sector, much of which was spurred by the effort to help the region to recover from the ravages of Hurricane Katrina in 2005. The area is also benefiting from research funds resulting from the Deepwater Horizon oil spill in 2010 (see 'Investment after the spill'). "This part of the country has become very attractive to people who are very idealistic and want to make a difference," says Vijay John, a chemical engineer at Tulane. "A lot of risk-taking young people have moved in. There's a sense of commitment, of community."

### BIOSCIENCE ON THE BAYOU

Not long ago, New Orleans and the surrounding area had virtually no start-up companies. But in the past few years, nearly 60 have sprung up, many in the biosciences sector, attracting

the attention of big-time investors, out-of-state venture-capital funds and pharmaceutical companies. Although the city is certainly not yet an established biotechnology hub, onlookers see the potential for significant growth.

"I'm beginning to see a critical mass of these elements of an entrepreneurial environment come together," says Tom Dickerson, adviser to Louisiana Fund I, a US\$26-million health-care venture-capital fund based in Baton Rouge. The region offers a cost of living that is below the US average, as well as robust tax incentives for investors and start-ups and a strong pool of talent from research and educational institutions.

Although start-ups often rely on just a handful of employees, the smattering of new businesses is already creating opportunities for research jobs and internships at all levels, from undergraduates to junior and senior researchers. The biotechnology boom is also offering scientists a chance to see their ►

► work commercialized, says Dickerson, noting that technology-transfer opportunities have become a tool for attracting top-quality researchers to universities.

The heart of the local biotechnology movement is BioDistrict New Orleans, a 6-square-kilometre state-supported economic-development area established in the business district in 2005. It draws together intellectual resources from the city's research institutions, including Tulane University, Xavier University of Louisiana, Louisiana State University (LSU) Health Sciences Center and Delgado Community College. One big project in the district is the Louisiana Cancer Research Center, a \$102-million facility that has created 235 jobs — mostly in research — and drawn nearly \$155 million in research grants. In 2011, officials also broke ground on the state's new teaching hospital, the University Medical Center, and construction has begun on the New Orleans Veterans Affairs Medical Center.

#### INCUBATING INNOVATION

Another key component of the BioDistrict is the 6,000-square-metre New Orleans Bio-Innovation Center, a non-profit life-sciences business incubator focused on university research and located on Canal Street near the French Quarter — close to the hub of New Orleans' economic activity, and to Tulane and the LSU Health Sciences Center.

The idea for the innovation centre took root in 2002, when Louisiana's governor was seeking ways to spur economic development, forge a 'knowledge economy' rather than relying on

tourism, and revive an area full of empty hotels and office buildings. "Everyone was looking for ways to rejuvenate the area while at the same time providing this kind of resource to the universities," says Aaron Miscenich, who became president of the centre in 2004.

At the time, there was little local precedent for translating research into products. Miscenich didn't see much of a culture of entrepreneurship. "There was brilliant research being done in the city, but none was being brought to market," he says. "Historically, the technologies were either leaving the state or just sitting in filing cabinets." And before Katrina, there was little economic investment to support such ventures, he adds.

When the hurricane hit, plans for the facility ground to a halt. "The level of uncertainty in our community was just staggering," says Miscenich. In late 2005 and early 2006, centre principals re-evaluated the business model, says Miscenich, and cut the projected size of the centre by half, but the state of Louisiana stepped in to provide \$47 million in construction costs, and building went ahead. The BioInnovation Center opened in 2011 and the state currently supports most of the facility's annual operational costs.

The centre houses around 20 tenants, from biotechnology start-ups and a clinical-research organization (CRO) to intellectual-property

attorneys and venture capitalists. Ultimately, it will provide space for up to 50 companies, which Miscenich hopes will draw well-established businesses and CROs to the city to create a wealth of research positions. "As some of these ventures succeed, hopefully they can spool up into larger-scale operations serving a national and global market," says Michael Bernstein, provost at Tulane. He is optimistic that companies will remain and generate more jobs.

#### THE SEEDS OF A HUB

Collaborations are already developing. NuMe Health is a tenant of the BioInnovation Center, and Heiman, who says the centre helps spur alliances, has built promising relationships with two companies in the building. "That led to a volley of brainstorming and an outline of potential new areas for our companies," he says. Heiman notes that Louisiana offers several incentives for start-ups, including an angel-investor tax credit and a 'phase zero' grant that funds companies to draw up proposals for higher-level funding; such schemes helped his company get off the ground, he says, and should draw other businesses.

Sudhir Sinha, a scientist turned entrepreneur, sold one biotechnology company in 2008 and was planning to retire when he learned about the opportunities at the BioInnovation Center. He rented space in the incubator to launch a new business, InnoGenomics, which specializes in techniques for extracting forensic information from trace amounts of degraded DNA samples found at crime scenes. He got the company under way with start-up capital, including a \$150,000

## ENVIRONMENTAL SCIENCE

### *Investment after the spill*

Environmental researchers in New Orleans and the surrounding area are benefiting from the silver lining of a rather large cloud: an influx of research dollars after the Deepwater Horizon oil spill in the Gulf of Mexico in 2010.

BP, the operator of the well that spewed almost 5 million barrels of oil into the Gulf, pledged to provide US\$500 million over ten years to support research related to the spill and its impacts on ecosystems. The company established the Gulf of Mexico Research Initiative (GoMRI), which so far has awarded eight grants to consortia made up of research institutions from around the region.

"With the federal and state budgets declining so drastically, it's one of the few sources of external research money right now," says Nancy Rabalais, director of the Louisiana Universities Marine Consortium based in Chauvin, which has received one of the grants. The disaster brought national attention to some of the Gulf region's

pressing long-term problems, such as land loss and hypoxia in coastal waters. Ultimately, she says, this has produced a shift in conservation: from small-scale mitigation projects to whole-ecosystem restoration.

The Louisiana Universities Marine Consortium's GoMRI project focuses on assessing the effects of the spill on coastal ecosystems and will create 25–30 positions, says Rabalais. Graduate students, postdoctoral researchers and research assistants will study marsh degradation and the effects of the oil on organisms living in shallow waters near the continental shelf. The 12 institutions comprising the consortium will collectively receive \$12 million, divided among all of them, over three years.

The demand for researchers is also growing in the private sector, says Ralph Portier, an environmental scientist at Louisiana State University (LSU) in Baton Rouge. LSU has just approved a PhD programme

in environmental sciences, set to begin in autumn 2012, which will focus on research related to the oil spill. The university also offers a master's degree in environmental sciences, the "scientific equivalent of an MBA", says Portier: companies send policy specialists and other employees without research backgrounds to develop expertise in areas such as soils and coastal restoration. "Employees go back to their companies with the environmental training needed to function as environmental-scientist planners and managers," says Portier.

The region is a hotspot of pressing environmental issues, adds Portier, noting its constellation of ecological attributes — including the Mississippi River, wetlands and agricultural land — and development challenges resulting from industrialization of oil and gas resources in the Gulf. "There are lots of issues, lots of problems and lots of opportunities," he says. **A.M.**

grant from the US National Science Foundation, and received help in developing his commercialization plan from graduating MBA students and interns at the centre. In the past year, InnoGenomics has created five full-time lab-research positions; Sinha anticipates adding several more in the next 12–18 months, including jobs for undergraduates and postdocs in biochemistry and molecular biology.

Another tenant, energy-technology company ReactWell, has taken advantage of the centre's non-profit status, core laboratory facility and access to Tulane's office of technology transfer, says founder Brandon Iglesias. In April, Iglesias won \$20,000 in start-up capital from the Tulane Business Plan Competition and the Domain Companies New Orleans Entrepreneur Challenge, to develop ways to use underground geothermal reactors to create synthetic crude oil from algal biomass. "It's quite scary to be in a start-up because the risk is pretty high," he says. "But I can't think of a more important issue to be working on than energy security." Iglesias says that New Orleans' location on the major waterway of the Mississippi River, close to the oil and gas industry and aquaculture in the Gulf of Mexico, gave him ready access to experts in his field.

The city still faces formidable challenges. More start-up capital is needed for new companies, and researchers at local universities aren't necessarily trained to meet businesses' needs.

"We have these institutions in place to help with training, but we just need to make sure that the programming they're providing matches the needs of the companies that we're putting together," says Miscenich. He adds that, for the city to succeed as a bio-hub, it must be able to retain talent. Louisiana must maintain its tax incentives and business infrastructure, and encourage an influx of established pharmaceutical firms and CROs to buoy the young companies and bring new jobs to the area.

"We need to come up with a business rationale to keep these companies in New Orleans," says Miscenich. "It's not just going to be the good food or the music; it's going to be because it makes economic sense to the company." ■

**Amanda Mascarelli** is a freelance science writer based in Denver, Colorado.

#### CLARIFICATION

In the Turning Point on Mayim Bialik (*Nature* **483**, 669; 2012) the quote about Stephen Hawking attributed to Kaley Cuoco was said by her character Penny during the show.

## COLUMN

# Piled too high

A passion for science is admirable, but can have unwanted outcomes, argues **Mariano A. Loza-Coll**.

**A**n independent film about the pursuit of a science PhD became a hit last year — at least among the fledgling scientists that it represents. Thousands flocked to see *The PhD Movie*, based on the hugely popular comic strip *Piled Higher and Deeper* by Jorge Cham, a former mechanical engineer, at hundreds of on-campus screenings in several countries. Not bad for a film produced, directed and acted in by graduate students and researchers at the California Institute of Technology in Pasadena, and funded on a shoe-string budget.

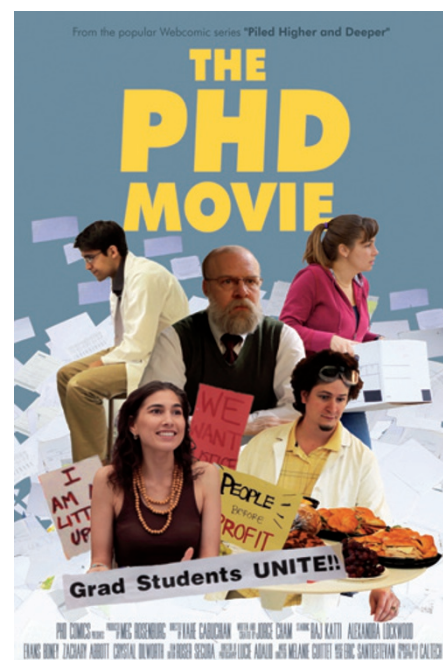
Why the popularity? The film puts the plight of the PhD student on the big screen, giving student audiences a chance to laugh at themselves in recognition of the years of schooling, hard work and frustration that they are undertaking.

But I would argue that there is another reason: the film tackles some of the negative aspects of pursuing a PhD and a science career. At its climax, *The PhD Movie* raises a question that crosses many students' minds: why bother? The answer it provides resonates with the audience: "Everybody is here because they want to be here... You have to embrace the things you're passionate about."

Yet the passion that drives many scientists to investigate the natural and physical world can also get them into trouble. It compels them to push the boundaries of science, but not always with healthful long-term consequences.

Hard work and a stubborn can-do attitude are admirable and rewarding. We put hours, days and months into experiments that don't work, because we're passionate about the exhilarating moments when they do. But the trade-offs and downsides are many. The romantic ideal of the scientist as an independent academic investigator uncovering knowledge can convince some very smart people to accept mediocre pay and delays in starting a family, settling down, buying a house and planning for retirement — with no guarantees that these sacrifices are worthwhile. That is the drama so nicely portrayed in *The PhD Movie*.

The film could be seen as a warning, showing budding researchers that they need to be realistic about their career expectations. But I see it as much more. It is a wake-up call for scientists and non-scientists alike. After all, it is not scientists, but the rest of society that may suffer most if scientists end up burning out. To ensure that scientists can cure diseases, feed the hungry and prevent environmental catastrophes, we should



select them on the basis of their intelligence, effectiveness and focus, not their personal sacrifices, obsession and stamina.

Why, then, isn't society at large demanding changes? I suspect that most people just don't know or understand what it takes to advance as a scientist. In the interests of science outreach, *The PhD Movie* and similar films should be distributed more widely to society at large (it can be viewed for a small fee at [www.phdmovie.com](http://www.phdmovie.com)).

We can use such films to start a conversation about how to nurture the practitioners and purveyors of science. With a good dose of sarcasm, *The PhD Movie* shows how graduate students spend much of their day second-guessing why they would spend another minute doing science. Another film, the 2009 documentary *Naturally Obsessed* ([www.naturallyobsessed.com](http://www.naturallyobsessed.com)), shows how capable, aspiring science graduate students become 'drop-outs' and 'sell-outs' for reasons that have nothing to do with intelligence and drive.

Scientists complain about how we are portrayed in popular culture. Maybe it is time to start sharing who we are, and what we do. ■

**Mariano A. Loza-Coll** is a postdoc in genetics at the Salk Institute for Biological Studies in La Jolla, California.