

► wishes we had more money to give," he says. In November, he will appear before the National Science Board with options on how the *JOIDES Resolution* might operate after its contract with the NSF ends in September 2014. The board will vote to authorize some level of funding, which will dictate how much research the ship can do. It currently costs about US\$65 million a year to conduct roughly four expeditions.

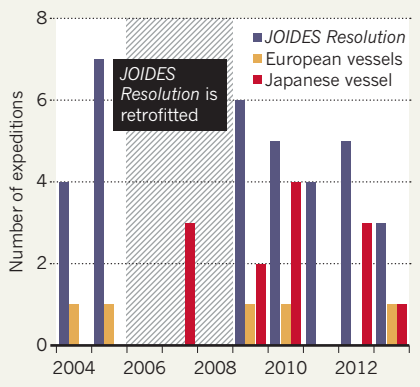
The United States has led the field of scientific ocean drilling since 1968, and today 26 countries share several expedition vessels under the IODP. The programme's other flagship is Japan's *Chikyu*, a \$540-million vessel with 'riser' technology that allows it to drill much deeper than the *JOIDES Resolution* can.

Scientists aboard the *Chikyu* have drilled into the fault that caused the deadly 2011 earthquake near Tohoku, Japan, and have investigated a dangerous fault zone closer to Tokyo, to probe the mechanics of these killer hazards. But the *Chikyu*, like the *JOIDES Resolution*, has faced higher operating costs than expected; it spends about five months a year on science, and the rest of its time on mostly industry work, to help to pay the bills. At an April workshop in Tokyo, *Chikyu* scientists laid out an ambitious wish list of projects, from exploring an ancient Mediterranean dry period to drilling into Earth's crust-mantle boundary, that would easily fill 12 months a year if Japan's government could afford them.

Other parts of the IODP effort are run by the European Consortium for Ocean Research Drilling, which operates 'mission-specific' platforms — hiring ships that are matched to

## DRILLING DOWN

Budget pressure has reduced the number of missions undertaken by US drilling ship the *JOIDES Resolution*.



each expedition. The group has scrambled to find money to operate roughly one mission a year, and currently has a ship drilling in the Baltic Sea to explore past glacial cycles.

But these long-standing arrangements are being shuffled. In the rechristened, reorganized 'International Ocean Discovery Program', the United States, Japan and Europe will fund their own platforms directly instead of combining funds in a central pot of about \$200 million. After years of courting, US officials have also brought in partners such as Brazil and China, which each pay \$3 million annually to the US programme. Many had hoped that this influx of international funds might allow the *JOIDES Resolution* to sail more expeditions each year.

But the NSF's budget woes make that look unlikely. Several years ago, the agency spent \$115 million on retrofitting the *JOIDES Resolution*, but the ship has spent only seven to eight months a year on science since then. "If it can only continue at that level, I think the community would view the glass as half full rather than half empty," says Keir Becker, a marine geologist at the University of Miami in Florida, and head of the new group that will coordinate activities among the US, Japan and Europe.

"If the United States falls over, then all these other countries are going to be left hanging," says Mike Coffin, a marine geologist at the University of Tasmania in Hobart, Australia. "Everyone is extremely concerned about what the United States is doing." (Australia has put in a five-year bid to continue participation in the programme.)

Conover brushes aside rumours that the United States is abandoning scientific drilling. "We are not terminating the programme," he says. But he adds that the NSF's ocean sciences division can only stretch so far. Its budget this year is almost \$343 million, or \$9 million less than the year before. Budget sequestration and other cutbacks have reduced its funding for core science by about 12% over two years.

At the same time, the 35-year-old *JOIDES Resolution* has only so much life left in it. "The community is waking up and seeing that we don't have this tool forever," says Bradford Clement, who oversees the ship's science services at Texas A&M University in College Station. "There is a sense of urgency here." ■

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## PUBLISHING

# Mystery over obesity 'fraud'

Researcher baffled after his results appear in bogus paper.

BY DECLAN BUTLER

Ghost writing is taking on an altogether different meaning in a mysterious case of alleged scientific fraud. The authors of a paper published in July (*A. Veziraki et al. Biochem. Biophys. Res. Commun.* <http://doi.org/nxb>; 2013), which reported significant findings in obesity research, seem to be phantoms. They are not only unknown at the institution listed on the paper, but no trace of them as researchers can be found.

The paper, published in the Elsevier journal *Biochemical and Biophysical Research*

*Communications (BBRC)*, is not the kind of prank that journals have encountered before, in which hoaxsters have submitted dummy papers to highlight weaknesses in the peer-review process. The paper's reported findings — that overexpression of two novel proteins in fat cells leads to improvements in metabolic processes related to diabetes and obesity in mice — are, in fact, true.

Too true, in the opinion of Bruce Spiegelman, a cell biologist at Harvard Medical School's Dana-Farber Cancer Institute in Boston, Massachusetts. He says that he has presented similar findings at about six research meetings,

and is preparing to submit them to a journal. He suspects that the *BBRC* paper was intended as a spoiler of his own lab's work.

Now withdrawn, the article lists five authors who are all supposedly from the School of Health Sciences at the University of Thessaly in Trikala, Greece, and is entitled 'Identification of meteorin and metnl as two novel pro-differentiative adipokines: Possible roles in controlling adipogenesis and insulin sensitivity'. Adipokines are proteins secreted by fat tissue that play an active part in such processes as sugar and fat metabolism, inflammation and obesity-related metabolic disorders, including insulin resistance and diabetes.

Spiegelman says that he smelt a rat as soon as he saw the paper. Meteorin and metnl have been little studied, and no previous paper has shown a role for them in obesity. It was therefore suspicious, he says, to see a paper published out of the blue reporting that they were novel adipokines and that their overexpression in adipose cells led to improvements in diabetes and obesity in mice — exactly the same findings as the work he had presented.

On 20 July, he e-mailed Ernesto Carafoli, *BBRC*'s editor-in-chief, to air his concerns.

"The authors on this paper have apparently never published a single academic paper before and they list a non-academic e-mail address," he wrote. "Odder still, upon looking for them on Google, PubMed or on the website of the university they list, there is no mention of any of the authors as being at that university."

Carafoli, along with Elsevier, launched an investigation. Elsevier temporarily withdrew the paper from the journal website on 8 August, and, after the University of Thessaly confirmed that none of the researchers listed on the paper had ever worked there, now intends to withdraw it permanently.

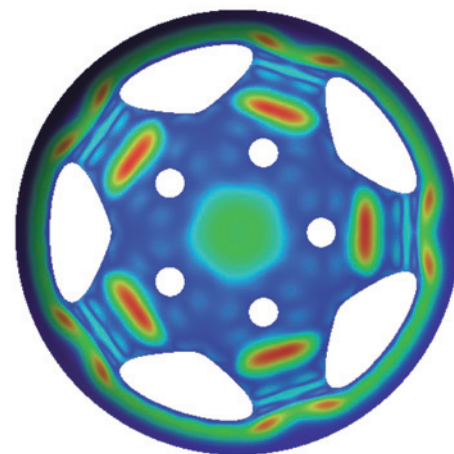
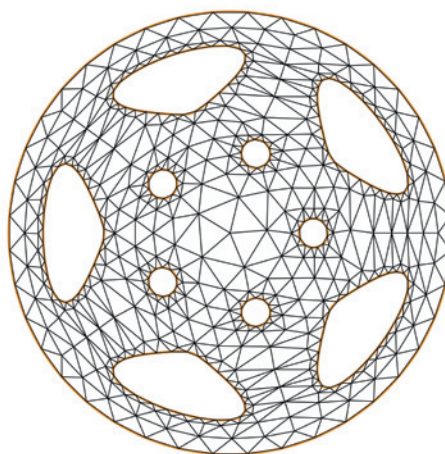
Spiegelman, who works on fat-cell differentiation, is also a co-founder of Ember Therapeutics, a company based in Watertown, Massachusetts, that is developing therapeutics for metabolic disorders. He believes that the paper was intended to hurt him and his lab. Scientific misconduct is usually done for academic gain, but because the authors on the paper seem to be phantoms, they can derive no benefit, he says. He argues that this seems to leave "maliciousness" as the only explanation.

Spiegelman says that he is surprised that the e-mail address of the corresponding author did not prompt the journal to ask for evidence of the authors' institutional affiliations. "The e-mail was a bit strange, and that we could have checked," agrees Carafoli, but nothing else in the paper aroused suspicion. "It was impeccable. The authors were clearly academics," he adds.

The perpetrators also seem to have used Greek surnames similar to those of authentic researchers working in obesity-related research, in what one might speculate was an attempt to fool referees should they search the literature. There are also genuine researchers at the University of Thessaly working in the field of obesity.

Spiegelman, who is certain that the paper is "made up", is keen for there to be a criminal investigation. He says that lawyers have told him that the faked paper represents fraud, not just academic misconduct — a view shared by Carafoli. But Spiegelman says the lawyers also advised that although he might have been the target, there would be little basis for him to sue, whereas Elsevier, BBRC and the University of Thessaly could have grounds to press fraud charges.

Elsevier told *Nature*: "BBRC has been targeted by a scheme to defraud our editors, reviewers and readers with submission of a manuscript with falsified author and institutional information and therefore wholly unverifiable scientific claims. We consider such abuse unethical." It added that it is continuing its investigation and will, with the relevant authorities, "explore the question of whether this constitutes a criminal case of Internet fraud." ■



A surface imaged by a patented method that was licensed to Intellectual Ventures by Caltech.

#### TECHNOLOGY TRANSFER

# Universities struggle to make patents pay

*Surfeit of unlicensed intellectual property pushes research institutions into unseemly partnerships.*

BY HEIDI LEDFORD

United States patent number 7,023,435 almost didn't happen. The application, which covered a way of imaging a surface, was rejected four times by the US Patent and Trademark Office. But the California Institute of Technology (Caltech) in Pasadena, which filed the patent, fought back — and prevailed in 2005.

Caltech's faith in the hard-won patent was not matched by industry: three years later, no one had licensed the rights to the invention. So in 2008, Caltech exclusively licensed it, along with 50 other patents, to a subsidiary of Intellectual Ventures, a company that has stockpiled 40,000 patents from which it collects US\$3 billion in licensing income. The firm sometimes uses its patents to sue other companies for infringement, yet it rarely develops the inventions described by its intellectual property.

Such patent-assertion entities, sometimes called aggregators, monetizers or 'patent trolls', are questionable homes for university inventions. But in the push to get academic research out of the ivory tower — and to make money — university technology-transfer offices are becoming less choosy about their partners.

"As universities struggle to find revenue sources, one might worry that the monetization industry will be very tempting," says Robin Feldman, director of the Institute for Innovation Law at the University of California Hastings College of the Law in San Francisco.

There are already signs that this is happening, she adds. Last year, she published evidence that 45 universities around the world licensed or sold patents to Intellectual Ventures shell companies (T. Ewing and R. Feldman *Stanford Technol. Law Rev.* 1; 2012).

Intellectual Ventures, headquartered in Bellevue, Washington, chafes at the term patent troll. The company's global head of technology, Patrick Ennis, points to its role in launching three start-up companies, and to deals it has struck with Caltech and other universities to sponsor

**"In the end, it just came down to money."**

research in exchange for ownership of the resulting patents as evidence of the firm's commercial activities.

Universities often say that the goal of licensing patents is to stimulate the economy by translating publicly funded research into companies and products. But the unstated aim is to make money to fund more research and the technology-transfer office itself, says Melba Kurman, a former technology-transfer officer at Cornell University in Ithaca, New York, who now works as a consultant. The goals are sometimes in conflict. "If the goal is to monetize the patent portfolio, then it would make sense to auction it off to the highest bidder," says Kurman. "But when these patents cover taxpayer-funded research, that is not an acceptable solution."

Finding a bidder at all can be a coup for technology-transfer officers, who are often saddled with patents that are years away ▶