

Mount Sinai's chief radiation-safety officer, notes that some researchers there have already conducted similar experiments.

Peter Heeger, head of organ-transplant research at Mount Sinai's Icahn School of Medicine, and his colleagues use caesium irradiators when testing immune responses in people who are going to receive organs. To predict whether a recipient's body will reject a new organ, the researchers culture B lymphocytes from the organ donor and test them against immune cells from the recipient. But B lymphocytes will not divide unless they are activated — here, by the presence of connective-tissue cells called fibroblasts. Heeger's team irradiates the fibroblasts to prevent them from replicating during this process. The scientists have run a series of unpublished experiments to determine how much X-ray radiation is necessary to suppress fibroblast growth.

"Now we know, and we are now comfortable switching for this particular procedure," says Heeger.

But Goodell says that many researchers would have to conduct lengthy experiments to ensure that they can make the transition without losing confidence in their results. Nor is she convinced that a switch to X-rays is necessary, given the security safeguards that are already in place. Anybody who needs to use the caesium irradiator at Baylor must present a security badge, enter a personal identification number and then submit to an iris scan. And if a person inside the secure room that contains the irradiator breaches any security protocols, an alarm automatically goes off in the university's security office.

"As a biologist, it's not clear to me what case has been made for [caesium irradiators] being an enormous security risk," she says.

Advocates of ending use of the devices say that the goal is to eliminate the risk of nuclear material falling into the wrong hands wherever possible. The security measures in place to protect caesium irradiators would not necessarily prevent the theft of nuclear material by somebody with permission to access these instruments, says Charles Ferguson, president of the Federation of American Scientists in Washington DC. Efforts to secure nuclear materials are often focused on this 'insider threat', as well as the disposal and recycling of irradiators, which can contain enough caesium to pose a hazard for centuries.

"I would not want humanity to lose the benefits of science," says Ferguson. "But if we can develop alternative technologies that prove comparable and can reduce the security threat to zero, I think that's a good thing." ■



Q&A Thierry Mandon

France's research transformation

Thierry Mandon, who became France's research and higher-education minister last June, has vowed to cut bureaucracy in a research system that is undergoing major changes. In 2013, laws were passed to accelerate the consolidation of universities, prestigious 'grand écoles' and research-agency labs into regional clusters that could develop common research policies. And in April, Mandon announced measures to further reduce researchers' paperwork and administrative burden. He talks to Nature about what he hopes to achieve in the year remaining before France's presidential elections in 2017.

What are the most urgent items on your to-do list?

To simplify the rules that govern higher education, and research. To have more PhD students and researchers recruited by companies and by the public sector, and so instil a culture of research in the places where decisions are made. To help universities to develop their own sources of income, so that they can be more independent of the state. To promote a renaissance of the social sciences. And to spur the digitalization of higher education.

What about funding? Scientists have warned that France's basic research is endangered by a lack of funding, in particular by cuts at the National Research Agency (ANR).

The ANR has seen its annual budget fall by around €250 million (US\$285 million) since 2012, to around €550 million. As a result, the success rate of grant applications is too low, at just under 10%. As President Hollande

announced in March, we plan to increase the ANR's budget by 10% this year, and by 20% next year, to bring it back to €800 million by 2018 — around the same level as its peak in 2008. We aim to boost the success rate of grant applications to between 14% and 20% in 2017.

Researchers have been critical of ANR bureaucracy. We plan to introduce a series of 50 reforms, most taking effect later this year, to lessen the administrative burden throughout the research and higher-education systems. The process of preparing grant proposals for the ANR will be greatly simplified, as will procedures for their assessment.

What else do you hope to put in motion before next year's elections?

We want to reinvigorate the social sciences. Research in the social sciences remains very focused on publications — but value will be created through greater contact with the hard sciences and through social-science ►

► researchers informing business and policy leaders. For example, after the terrorist attacks in France last year, the CNRS [France's National Centre for Scientific Research] got all the relevant research groups working to better understand the problem of radicalization. We plan to launch new research programmes, with an initiative at the University of Paris-Sud's campus d'Orsay which will bring together much of our expertise in the social sciences.

France has often had a reputation of lagging in innovation — yet French start-up firms seem to be an emerging force.

France has made it easier for researchers to become entrepreneurs. But we don't succeed in making start-ups grow. Part of the problem is that the strategy of start-ups is too often to be bought out by firms in other countries. There's still too little direct contact between companies and universities, and we are working to improve this. Wealth creation must become one of the missions of the universities. Moreover, the universities are still 90% dependent on state funding. More direct links with companies could also allow universities to generate more durable financing themselves.

Is a problem in the perception of French science that the research community seems to promote its successes much less than do, say, its US and UK counterparts?

It is a problem. I spend my time telling French researchers to sell themselves a bit better. Take the example of the recent discovery of gravitational waves. There was a simultaneous press conference in Italy, in France and in the United States. In France, it was a low-key event in a minuscule room at CNRS, where our researchers expressed everything very modestly. By contrast, at the US event [at the National Press Club in Washington DC], one had the impression that we were at a White House event.

I'm not saying that French researchers should become as excessive as the Americans can sometimes be in their capacity to sell their advances. But in the modern world, we need to be a bit more promotional to make our excellence in research better known. At the same time, I respect a lot the sort of ethical aspects of their modesty, which has a good side.

It often seems very difficult to create change in France. But universities are innovating. My big message is that France is in the process of profoundly changing, and that researchers often aren't really taking the measure of that change. ■

INTERVIEW BY DECLAN BUTLER

This interview has been translated from French and edited for length and clarity. See go.nature.com/o79dmq for a longer version.



Neuroscientist Elena Cattaneo has made complaints about the Human Technopole to the Senate.

ITALY

Row grows over biomedical centre

Document submitted to the Italian Senate criticizes institute that will oversee a €1.5-billion project.

BY ALISON ABBOTT

A plan to create a €1.5-billion (US\$1.7-billion) centre for biomedical and nutritional research has been causing rifts between Italian scientists ever since Prime Minister Matteo Renzi announced it last November. Now the row has escalated, courtesy of a 48-page document submitted to the Italian Senate on 4 May by Senator Elena Cattaneo, who is also a neuroscientist at the University of Milan.

In the document, she complains that the idea for the centre, called the Human Technopole, was conceived by a small group of scientists behind closed doors, and that the large sum of money involved should not be concentrated in a single project, in particular because Italy's research community as a whole has been starved of funds for years.

"To allocate money in this way without discussion of ideas corrupts the ethics of science," Cattaneo told *Nature*.

That sentiment is in line with arguments

already made by Cattaneo and others. Cattaneo's report also lists a series of complaints against the Italian Institute of Technology (IIT) in Genoa, which Renzi has designated to oversee the Technopole project.

The complaints against both institutes are "entirely political", says Roberto Cingolani, who is the Technopole's main architect and director of the IIT. He designed the Technopole concept together with scientists from various universities and research institutes in Milan, and now plans to submit a detailed rebuttal of Cattaneo's document to the parliament.

Like the IIT, the Human Technopole was approved by government decree, and, although supported with public money, will be a private foundation. As such, it will avoid much of the red tape that holds back state universities and publicly funded research institutes.

According to Cingolani's plan, the Technopole will focus on genomics and personalized medicine, with an emphasis on nutrition,

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