

SCIENCE FUNDING

Huge petition in Spain decries 'abandonment' of research

Scientists deliver 277,000-signature campaign to parliament in protest over poor funding.

BY MICHELE CATANZARO

Spain's leading scientific organizations delivered a petition signed by more than 277,000 people to the national parliament in Madrid on 11 April, calling on the government to stop the "progressive abandonment of science in Spain" caused by budget cuts. The petition is the largest ever on a science-policy subject in Spain.

Its key promoters urge the government to, by 2020, return investment in science to almost €10 billion (US\$12.3 billion) — a level last seen in 2009.

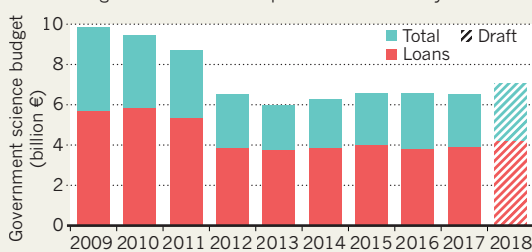
Between 2009, when the global financial crisis hit, and 2013, the country's science budget plunged by 39%, to about €5.9 billion (see 'Spain's science woes'). Since then, research funding has increased little.

A group of researchers posted the petition online in February. Its backers include the Federation of Young Researchers and the two largest Spanish workers' unions.

The petition's delivery to parliament came a week after Spanish scientists received a glimmer of good news. On 3 April, the government

SPAIN'S SCIENCE WOES

On 3 April, the Spanish government announced plans to boost its science budget by 8.3% in 2018, but about 60% of the overall budget would be made up of loans to industry.



submitted a draft budget for 2018, which included an 8.3% boost for science funding over 2017's allocation. If approved by parliament, the raise would be the biggest in a decade, and would take the budget to around €7 billion.

"We welcome the increase. It's an essential step, but just the first one," says Nazario Martín, a chemist at the Complutense University of Madrid and president of the Confederation of Spanish Scientific Societies (COSCE).

Some scientists still see problems. For the past several years, much of the science budget

has been made up of loans. And many scientists have accused the Spanish government of using this to inflate science funding. The loan money is usually offered to companies for applied-research projects but must be returned, although under favourable interest conditions. However, a substantial part of the loans usually goes unrequested and remains unspent. An analysis of the budget released by COSCE last week shows loans would make up about 60% of the overall 2018 science budget

There's no guarantee that the budget will be approved in its current form, and the governing People's Party does not hold an absolute majority in the parliament. But Alicia Durán, a physicist at the Spanish National Research Council (CSIC) who was one of about 65 scientists who delivered the petition, is hopeful that it will effect some change. Members of parliament across the political spectrum have said that they would be prepared to sign an amendment to the budget protecting aspects of science they all agree on — such as improving funding — from negotiations about other parts of the budget, says Durán. ■

SOURCE: ICONO-FECYT/COSCE

WEAPONS

Chemical attacks highlight need for better forensics

International watchdog probes assassination attempt in Britain and suspected Syria attack.

BY DECLAN BUTLER

As investigations continue into the attempted assassination of a former Russian double agent and his daughter in Britain, findings released this week have renewed focus on the class of nerve agents allegedly used. And experts say that the UK event and a suspected chemical-weapons attack in Syria provide fresh impetus for international efforts to beef up forensic capabilities.

On 12 April, the Organisation for the

Prohibition of Chemical Weapons (OPCW) confirmed that its independent tests of environmental and biological samples related to the assassination attempt identified the same poison as did investigations by forensic scientists at Britain's national Defence Science and Technology Laboratory at Porton Down. The attack happened in the nearby city of Salisbury on 4 March. The OPCW, based in The Hague in the Netherlands, is responsible for enforcing the 1997 Chemical Weapons Convention, which bans the production and use of such arms.

The organization did not name the chemical agent publicly, but will share its identity and structure with states party to the convention, in a classified report. More details might emerge at a special meeting of the OPCW's executive council to discuss the report, scheduled for 18 April. The UK government has said that the compound belongs to a class of nerve agents known as Novichoks.

The watchdog also agreed that the toxic chemical was very pure. That points to it having been made by "a highly proficient team and in a well-refined process", says ▶

► Alastair Hay, an environmental toxicologist at the University of Leeds, UK. The OPCW did not say where the substance might have been made; the UK government has alleged that the Russian state was directly behind the attack, but critics say that this is a politically motivated claim and that there is no forensic evidence to back it up.

CHEMICAL DETECTIVE WORK

Experts say further investigations could provide more clues. Forensic inquiries into chemical attacks typically involve standard tools such as gas and liquid chromatography, which are used to separate a substance into its components. Researchers then study those compounds with analytical techniques such as high-resolution mass spectrometry, nuclear magnetic resonance spectroscopy, isotope-ratio mass spectrometry and inductively coupled plasma mass spectrometry.

Forensic methods can build up chemical signatures of the components of a sample to give investigators leads about how it was made, says Brad Hart, director of the Lawrence Livermore National Laboratory's Forensic Science Center in Livermore, California. The varying ratios of stable isotopes of component elements, for example, can provide information about where the starting materials came from, he says.

Other sample components can offer clues

about the methods of synthesis, potential starting materials and the sophistication of manufacture, he adds. "Anything detected in the sample that is not the primary prod-

Forensic methods can build up signatures of a sample to give leads about how it was made.

uct is of interest as a potential signature," says Hart. "These typically include unreacted starting materials, products of side reactions, breakdown or decomposition products of the primary product or other signatures."

But it's not yet possible to definitively identify the geographical or institutional source of a chemical weapon using chemical forensics alone, he says.

ALLEGED ATTACK

The OPCW report came just days after an alleged chemical-weapons attack on the city of Douma in Syria, on 7 April. An OPCW fact-finding mission has gone to Syria to investigate the incident. The team will interview witnesses, and collect samples and evidence such as autopsy reports and photographs. Experts say that such attacks underscore the need to increase international chemical-forensic capacity for investigation, and intensify research in the field.

The OPCW is already taking steps in this direction. From 12 to 14 February, it held the first meeting of its science board's newly created temporary working group — made up of leading scientists and experts from national defence and other labs — charged with carrying out an in-depth review of the state of the art of chemical forensics.

And in April last year, international researchers, treaty experts, law-enforcement agencies and industrialists formed the Chemical Forensics International Technical Working Group, an ad hoc group aiming to identify research gaps and other factors that hinder investigators who use forensics to track down the source of chemical weapons.

A first glimpse of the panel's plans came at the OPCW's February science meeting. Carlos Fraga, a chemical-weapons specialist at the Pacific Northwest National Laboratory in Richland, Washington, and a driving force behind the international technical working group, says the team is proposing to develop a database of signatures of chemical weapons and their precursors. During the destruction of the world's chemical-weapons stockpiles, researchers gathered vast amounts of analytical data that could be added to the database, along with unpublished data collected during the OPCW's routine inspections of chemical plants, and by OPCW-designated labs. ■