all these diseases; it was only tropical-health researchers who were interested in them," he says.

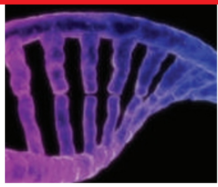
"Bioterrorism is taken into account, of course," says Raoul. But the primary motivation is to help the EU prepare for emerging diseases such as SARS. BSL-4 labs are a vital part of the standard response to an outbreak, responsible for isolating and characterizing the pathogen, developing diagnostic techniques and sometimes working on potential therapies. "We are seeing roughly one new emerging or re-emerging pathogen per year, while pathogens are also changing their geographical ranges, and travel is resulting in more imported cases of exotic diseases," says Philip Luton, a scientist who is now head of business development and spokesman at the UK Health Protection Agency's Centre for Emergency Preparedness and Response at the Porton Down military establishment near Salisbury.

Although Günther is sceptical about the need for more labs, he thinks that the ERINHA project would certainly help existing facilities to upgrade. Whereas national governments may fund the construction costs of BSL-4 labs, they are often unwilling to cover the running costs of such labs in the long term, he says, a problem that a pan-European network could help to address. The running costs of a BSL-4 lab are much higher than those of a typical virology lab, says Raoul. Maintenance of his own Lyon lab runs to €1.5 million annually, on top of €1 million in salaries for the core support staff who assist visiting researchers.

The best way to ensure sustained operational funding is to make a well-argued case at the European level and to get buy-in from national decision-makers, argues Raoul. "We are making it clear that to construct a BSL-4 lab without taking into account its subsequent running costs is suicidal." ■

Declan Butler

For more, see Editorial, page 137, and News Feature, page 154.



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Call to boost isotope supplies

The US Department of Energy should build two dedicated isotope-production facilities, costing about $65 million in total, to solve worsening supply problems for researchers in medicine, physical sciences and national security. That's the conclusion from a panel convened by the energy department's Nuclear Science Advisory Committee (NSAC), which approved the panel's report on the state of the US isotope programme on 5 November.

The programme supplies researchers with isotopes that are not readily available from commercial suppliers, and is tiny compared with the vast market for routinely used medical isotopes, such as technetium-99m — which itself is still beset with ongoing supply problems (see *Nature* 460, 312–313; 2009).

Despite the programme's small size — its 2008 budget was just $32 million — its products are essential to a wide array of research fields. But fragmented and ageing production facilities at the energy department have struggled to keep up with the variety and pace of demands. So last year the department commissioned the NSAC to identify the most important research isotopes and to come up with ways to alleviate supply fluctuations.

"Other priorities can sometimes bump research-isotope production to the back of the line."

The committee concluded that a group of isotopes with potential for use in medical therapy were the most critical. These isotopes, including actinium-225, emit α-particles that have high energies but low velocities, which means that they are effective at killing tumours without damaging healthy tissue. But shortages are holding up clinical trials, says Roy Brown, who was an industry representative on the report and is director of federal affairs for the Council on Radionuclides and Radiopharmaceuticals, which represents US and Canadian isotope manufacturers. Other important medical isotopes include arsenic-76, used in palliative care for bone pain, and palladium-103, implanted as seeds into prostate glands to kill cancers.

But isotopes are used for more than just medicine. Physicists want californium-252 so they can split its heavy nucleus to make beams of smaller, rare isotopes, useful for frontier experiments in nuclear physics. NASA wants better supplies of plutonium-238 as a thermal heat source for long-lived planetary probes. And germanium-76 is needed for decay experiments that test whether neutrinos are their own anti-particles, which could help explain why the Universe is dominated by matter rather than anti-matter.

Isotopes used in national security often take precedence over other research needs — especially in the case of helium-3, which is being used in neutron detectors at ports to spot smuggled plutonium. But this has pushed up prices for researchers who want helium-3, used in many of the ultra-low-temperature refrigeration systems needed, for example, to study the super-cooled clouds of atoms known as Bose–Einstein condensates.

The report says that supplies of many of these isotopes could be much improved by building two new facilities. One would be a electromagnetic separator to enrich certain rare isotopes; the other would be an accelerator, which could collide different particles to create isotopes that are not found naturally. Donald Geesaman, a physicist at Argonne National Laboratory in Illinois who co-chaired the report committee, says that the separator could be built for $25 million and the accelerator might cost $40 million.

Research isotopes managed by the programme currently come from three places: accelerators at Brookhaven National Laboratory in Upton, New York, and Los Alamos National Laboratory in New Mexico, as well as from a nuclear reactor at Oak Ridge National Laboratory in Tennessee. But producing research isotopes is a secondary task for these facilities, and other priorities can sometimes bump isotope production to the back of the line, says Brown.

Jehanne Gillo, who directs the isotope programme for the energy department, says that the report comes too late to be included in the department's budget request for fiscal year 2011, but could be used to compete for money against other requirements in 2012. ■

Eric Hand