

► Ageing research has hit bumps in the past decade, as companies marketing drugs touted to prolong life have gone bust (see *Nature* **464**, 480–481; 2010). But organizers of the TAME trial think that the field is now in a better position because animal studies have shown that some drugs and lifestyle practices can extend life by targeting physiological pathways¹.

For instance, the NIA-sponsored Interventions Testing Program, in which investigators at three sites are systematically trialling candidate age-delay treatments, has shown that a handful of interventions convincingly and reproducibly prolong the lives of various strains of mice. Those include cutting down on calorie intake and taking a drug called rapamycin that is used to prevent rejection of transplanted organs.

And researchers from the Novartis Institutes for Biomedical Research in Cambridge, Massachusetts, reported in December that elderly people develop a stronger immune response to an influenza vaccination if they also take a rapamycin-like drug². Rapamycin, which acts on a biological pathway involved in cell growth, is now seen as one of the most promising drugs for delaying ageing, but given over long periods of time it also suppresses the immune system.

SAFETY FIRST

The TAME test is for metformin, which suppresses glucose production by the liver and increases sensitivity to insulin. The drug has been used for more than 60 years and is safe and prolongs healthy life and lifespan in worms³ and in some mouse strains¹. Data also suggest that it could delay heart disease, cancer, cognitive decline and death in people with diabetes⁴. Plans call for the trial to enrol 3,000 people aged 70–80 years at roughly 15 centres around the United States. The trial will take 5–7 years and cost US\$50 million, Barzilai estimates, although it does not yet have funding.

Matt Kaerberlein at the University of Washington, Seattle, who is running a trial of rapamycin in elderly dogs, says that the concept behind Barzilai's trial is sound. Even though other drugs might be more effective at delaying ageing in animal studies, he says, the many years of experience with metformin in people, combined with data suggesting that it impacts the ageing process in people, make it a good candidate for a first clinical trial in the field.

"It's a smart way to engage the FDA in a discussion about recognizing ageing as an indication that is appropriate for clinical trials," Kaerberlein says. ■

1. Miller, R. A. *et al.* *J. Gerontol. A Biol. Sci. Med. Sci.* **66A**, 191–201 (2010).
2. Mannick, J. B. *et al.* *Sci. Transl. Med.* **268**, 268ral179 (2014).
3. Onken, B. & Driscoll, M. *PLoS ONE* **5**, e8758 (2010).
4. Bannister, C. A. *et al.* *Diabetes Obes. Metab.* **16**, 1165–1173 (2014).



Infrared technologies are subject to tight restrictions because of their military applications.

TECHNOLOGY

US 'export rules' threaten research

Proposed updates to national-security regulations would restrict collaboration with foreign scientists and industry.

BY ALEXANDRA WITZE

The US government is considering policy changes that could dramatically affect how researchers handle equipment and information that have national-security implications. Among other impacts, scientists would need to reconsider what they can discuss with graduate students from other countries, or when travelling abroad on work trips.

One set of rules would affect technologies such as infrared detectors, which are commonly used for environmental and other types of monitoring but can fall under military restrictions because of their night-vision capabilities. Another set of proposed rules would revise the government definition of "fundamental research" in ways that could affect any scientist who

collaborates with industrial partners.

The proposals are part of a long-running effort to overhaul Byzantine regulations that seek to prevent certain information and technologies from reaching countries perceived to be hostile by the United States. These 'export control' rules can create a major — even perilous — headache for US researchers. In 2012, a plasma engineer at the University of Tennessee in Knoxville began serving a four-year jail sentence for violating these rules by working with graduate students from China and Iran while on a US Air Force contract.

Public-comment periods on the proposed rules close on 6 July and 3 August, and science groups are trying to raise awareness of what is at stake. "Once the rules get put in place, it's very hard to dial back if you find them overly aggressive," says Gregory Quarles, a physicist

MOISES SAMAN/MAGNUM

and board member of the Optical Society, a professional organization in Washington DC that is encouraging its members to study the rules and weigh in with any concerns.

Export control covers both physical equipment that leaves the United States — such as spacecraft components on their way to a launch site, or a laptop computer carrying sensitive information to a conference — and information conveyed to someone from another country. There are two parallel lists that describe which items are controlled, one maintained by the US Department of State and the other by the Department of Commerce. Over the past five years, regulators have been working to relax the system, moving some items from the restrictive state-department list — commonly known as ITAR, for International Traffic in Arms Regulations — to the less tightly controlled commerce-department list. But they have left some of the hardest topics for last.

On 5 May, the departments released the first set of long-awaited proposals for regulating the category that includes sensors and night-vision equipment. Many researchers hoped these would loosen current regulations that they say have impeded research, but that does not seem to be the case. The rules specify performance parameters, such as wavelengths for infrared cameras, that would continue to restrict commercially available sensors that are popular

with many researchers for environmental, medical and other applications.

At the University of Rochester in New York, astronomer Judith Pipher develops infrared detectors to observe the cosmos, which are regulated under ITAR because military night-vision goggles also use infrared sensors. Astronomical sensors detect radiation that is one million times less intense than that detected by

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the military, but neither the current nor the proposed rules take that into account. “I don’t think this particular reform is going to get us there,” says Pipher, who, before she acquired US citizenship, was once barred from seeing data gathered by infrared instruments that her team was testing.

The second set of proposed rules could have wider-reaching consequences. It aims to harmonize state and commerce department definitions of terms such as “fundamental research” and “public domain”.

In general, the rules state that information developed through fundamental research is considered to be in the public domain and not subject to ITAR controls. But one newly added phrase says that if the research is subject

to proprietary review before being published, such as by a company that sponsored the work, then it falls under ITAR.

“We’ve heard from at least a few institutions that this will totally stifle their ability to work with industry,” says Tobin Smith, vice-president for policy at the Association of American Universities in Washington DC.

Any university researcher who has a contract or sponsored research agreement with a company could face a huge load of paperwork. “It will fundamentally change the way we do business,” says Elizabeth Peloso, associate vice-president and associate vice-provost for research services at the University of Pennsylvania in Philadelphia.

The new rules would add some needed changes, she adds, such as clarifying that a US researcher can e-mail data to a collaborator elsewhere in the world, as long as those data are encrypted.

After the comment periods close, the state and commerce departments will either issue another round of interim rules for more feedback, or publish whatever final regulations they decide on.

“You asked for reforms, so now you got it,” says Kevin Wolf, who oversees the export control reform effort at the commerce department. “If you’re an export nerd, now is an exciting time.” ■