agreements have been negotiated with the environment ministry, allowing them to continue with their research[6].

Some industrialized countries that want to defend their business sectors may resist demands for greater transparency. In doing so, they will undermine their non-commercial research sectors, which rely on open, trusting relationships with provider countries. On the other side of the fence, some biodiversity-rich developing countries may be tempted to demand a defensive, protectionist regime that assumes all research projects are equally likely to yield big commercial benefits. Yet excessive red tape could force non-commercial researchers to conduct their work elsewhere.

If this happens, developing countries will lose on two fronts. The public knowledge created by pure research is essential for countries to support any claims that a commercial product came from samples taken from their territories. Biodiversity inventories and databases, museum collections and DNA bar-coding (www.barcodeoflife.org) — identifying species using short DNA sequences — provide openly accessible documentation of which species occur in which countries. Additionally, international collaborations offer the opportunity to develop universities, museums, scientific expertise and economic growth. Non-commercial research on the ecology of native grasses, trees and shrubs, and invasive plants in Ecuador, for example, is helping local farmers to better manage their land.

With just a few days before COP-10, consensus on the IR-ABS still seems a long way off. All sides should back the text on non-commercial research that was recently added to the draft protocol, regardless of where they stand on other issues relating to the treaty. If not, the CBD's two other long-term goals will be jeopardized: conserving biological diversity and promoting its sustainable use. ■

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1. Secretariat of the Convention on Biological Diversity *Access and Benefit-Sharing in Practice: Trends in Partnerships Across Sectors, Technical Series No. 38* (2008).
2. Secretariat of the Convention on Biological Diversity *Appendix II of the Bonn Guidelines on Access to Genetic Resources and Fair and Equitable Sharing of the Benefits Arising out of their Utilization* (2002); available at http://go.nature.com/a8jqao
3. http://go.nature.com/3atqx5
4. Grajal, A. *Conserv. Biol.* **13,** 6–10 (1999).
5. Australian Natural Resource Management Ministerial Council *Nationally Consistent Approach for Access to and the Utilisation of Australia's Native Genetic and Biochemical Resources* (2002); available at http://go.nature.com/he7ikv
6. Personal communication from Australia's designated competent national authority for genetic resources.

G. HERBERT/AP PHOTO

President Barack Obama touring an oncology lab in Bethesda, Maryland, in September 2009.

A two-year plan for US science

Daniel S. Greenberg sets out five things that the White House and Capitol Hill can and should accomplish between now and the 2012 election.

The widely expected rightward shift in the coming US midterm election reflects hostility to the current government's spending and programmes. Will that be bad for science, with its lifelines to the US treasury? Maybe not. With some exceptions, the scientific enterprise is out of the line of political fire. Both parties trumpet the importance of science. And there's a lot they can do for the enterprise, even with low-growth or stagnant budgets. In most instances, the opening move belongs to the president, who has demonstrated solid support for science.

What should be on Barack Obama's to-do list for science in the next two years? First, assuming little or no increase in total federal research and development (R&D) spending, the president should seek to reverse the growing emphasis on defence-related R&D relative to support for civilian programmes. In the 1970s, at the height of the cold war, government spending on civilian and military research was about the same. The civilian R&D budget was even slightly ahead in 1979, at US$51.1 billion, compared to $48.9 billion for the Pentagon. Today, defence R&D accounts for about 59% of the federal R&D budget — $85.3 billion for the Pentagon, compared with $60.2 billion for civilian R&D. There ▶

is little sense in that, given the winding down of the war in Iraq, plans to get out of Afghanistan and the growing scientific and technological competence of the nation's industrial competitors. Even as China builds up its military strength, the United States remains overwhelmingly ahead in military R&D.

Better to shift some of those defence R&D dollars to academic and commercial research. That may seem hard to do, given the traditionally strong Republican backing for military funding. But prominent Republicans, with former house speaker Newt Gingrich in their lead, are among the most vociferous exponents of science as the key to economic strength. Furthermore, because the military increasingly dips into the civilian economy for dual-use technologies, the shift may actually be beneficial for the armed services.

AGE BIAS

With defence R&D money diverted to civilian accounts, real remedies should be directed at the neglect of youth in the allocation of research grants. The worst offender is the National Institutes of Health (NIH), where the average age for receiving a first grant has risen to 42 from about 36 in 1981 (see chart). In 2006, the NIH moved to reverse this age trend with grants for young researchers and further moves are afoot this year (see *Nature* **467,** 635; 2010). But the geriatric tilt persists. If budget growth is unavailable for a properly funded youth programme, then a reallocation from the old to the young must be made, painful as that would be. Given Congress's tradition of strong support for the NIH, even while other science budgets languish, a strong presidential pitch for additional funds to support young health researchers is likely to be favourably received. The extraordinary doubling of the NIH budget between 1998 and 2003, for example, was initiated by congressional Republicans.

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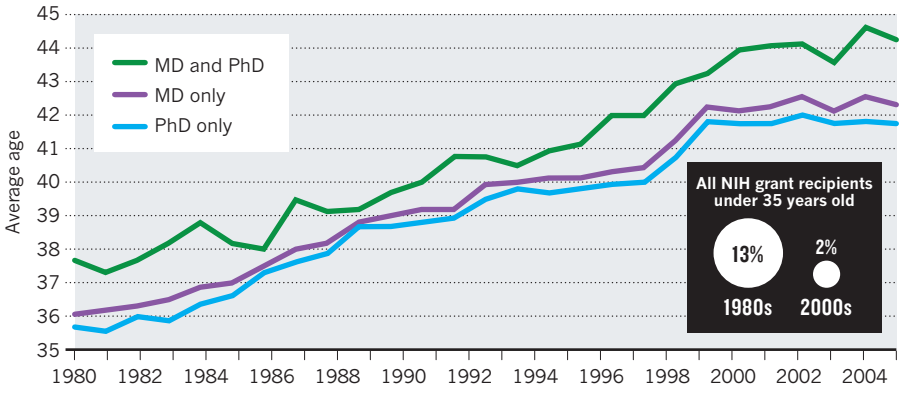
Should military spending account for 58% of the US research and development budget?

THE GERIATRIC TILT OF US HEALTH RESEARCH

The age at which National Institutes of Health (NIH) grant receipients win their first grant (R01 or equivalent) has been increasing for decades, despite moves to reverse the trend.



SOURCE: NIH

Tax credits should be used to prod industry into providing greater support for the university-based science programmes that underpin much of America's high-tech success. Industrial money accounts for a mere 5–7% of all the money spent on science-related activities in academia. When industrial firms do pitch in, it is usually to exploit the specialized skills of university science and engineering departments — such as when a group of energy companies including ExxonMobil provided funding for a Global Climate and Energy Project at Stanford University in California in 2002. Sadly, there's no reason to expect that industry, with minor exceptions, will recognize its own self interest and provide string-free money for the education system on which it depends for trained personnel and innovative research.

At virtually no cost, the White House can bolster public confidence in science by cleaning up the conflict-of-interest mess that repeatedly makes headlines, particularly concerning financial links between academia and the pharmaceutical industry. New regulations drafted by the NIH are a step in the right direction, requiring disclosure of all outside income above $5,000, down from $10,000 under the old rules. But the new regulations fall short by relying on university administrators to monitor their employees' outside financial dealings — a task they don't like and that many, in effect, ignore. Meanwhile, the NIH itself has followed a policy of 'trust but don't verify'. Spot checks by NIH staff should be part of any reform effort. And penalties should be strengthened — currently they are ridiculously mild, commonly involving two or three years of ineligibility to apply for the next grant.

The financial future for science is complicated by the injection last year of more than $18 billion in stimulus money for federal research agencies. Directed at boosting employment, the money came with orders to spend it all within two years. This predictably set off an avalanche of research proposals. But the money will soon be gone, and will not be replaced under the normal budget process. Given the disruptions caused by abrupt financial ups and downs in the conduct of research, this is an area that merits some relief from the budget restraints that lie ahead.

Should all of these steps be taken, it won't boost or protect all areas of science — particularly not the ceaseless battleground of reproductive biology. If Congress moves to the right with more Republican seats, the stem-cell issue will flare even higher than it has in recent months, with renewed attempts to prohibit all research based on cells derived from human embryos. Don't expect comity on that topic.

Obama has repeatedly demonstrated respect and support for science in public statements and policy-making. His appointees for heading federal research agencies have all received strong approval in the scientific community. His embrace of science is widely emulated in Congress. Even in the stormy politics anticipated for the next two years, the steps cited above are achievable, and they are important because they can ensure the continued excellence of American science. ■ SEE EDITORIAL P.751

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CORRECTION

Katherine Homewood withdrew from the author list of the Opinion piece 'Road will ruin Serengeti' (*Nature* **467,** 272–273; 2010) before publication; her name should not have been included.