

NEWS IN FOCUS



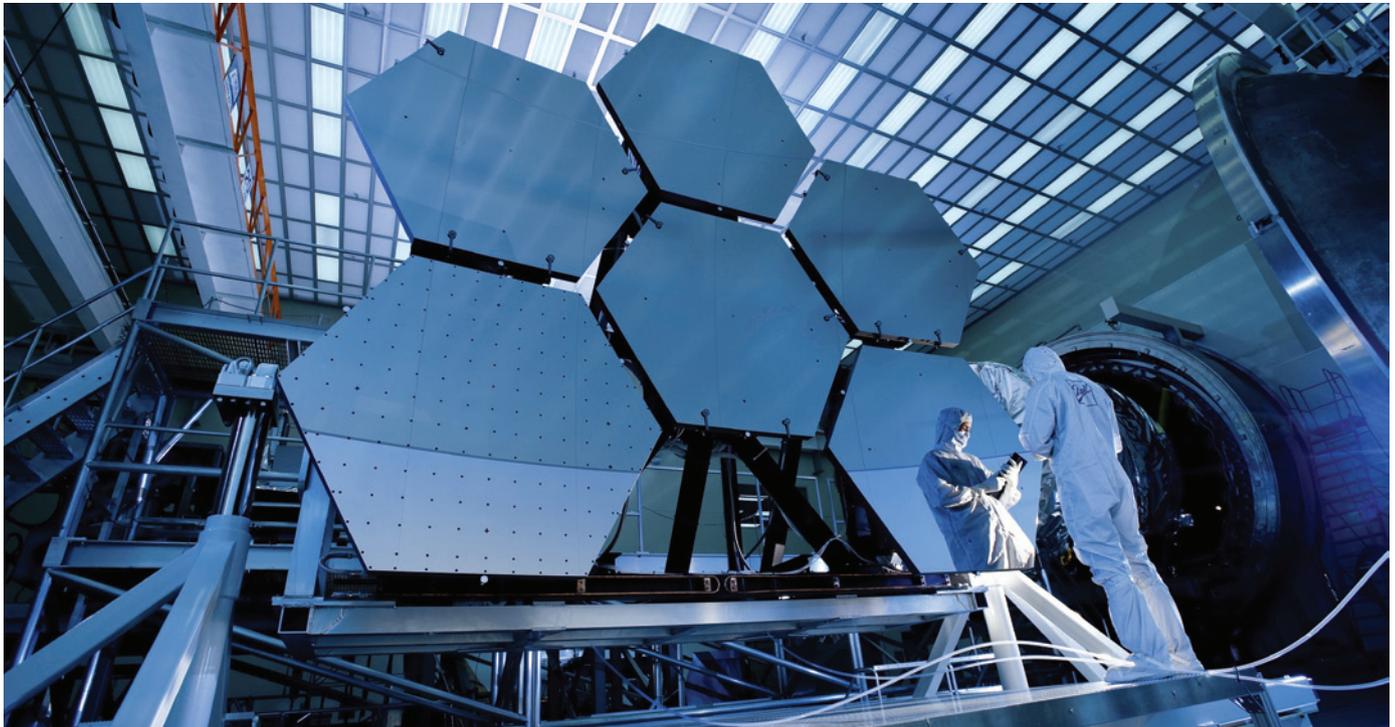
DRUGS A watershed approval for tumour-targeting toxic antibodies **p.380**

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The James Webb Space Telescope's segmented mirror is already taking shape, but massive cost overruns have led to calls for the project to be cancelled.

ASTRONOMY

NASA to share telescope cost

Budget-busting astronomy project could get extra cash from human spaceflight funds.

BY ERIC HAND

The James Webb Space Telescope (JWST) is perilously overbudget and under threat of cancellation, but *Nature* has learned that it may be offered a financial lifeline. The flagship observatory is currently funded entirely through NASA's science division; now NASA is requesting that more than US\$1 billion in extra costs be shared 50:50 with the rest of the agency. The request reflects administrator Charles Bolden's view, expressed earlier this month, that the telescope is a priority not only for the science programme, but for the entire agency.

NASA expects that the total cost of getting the 6.5-metre telescope to the launch pad by 2018 will be about \$8 billion, around

\$1.5 billion more and three years later than an independent panel predicted in November 2010. Because in the next few years agency budgets are likely to be flat at best, scientists had feared that the JWST would end up swallowing the \$1-billion astrophysics budget whole, or at least heavily eroding the \$5-billion science-division budget. The new proposal would scrape money from other corners of the agency's \$18-billion budget, which also supports programmes such as aeronautics, technology development and human spaceflight. Matt Mountain, director of the Space Telescope

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Read 'The telescope that ate astronomy'.
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Science Institute in Baltimore, Maryland, says he is glad that the agency is making the JWST a priority. "There's an

acknowledgement that the science budget can't solve this on its own," says Mountain, whose institute operates the Hubble Space Telescope and is preparing to do the same for the JWST.

The proposal to share the JWST's costs across the agency is part of a 'replan' developed by NASA after the independent panel criticized the project's management and found it to be colossally overbudget (see *Nature* 468, 353–354; 2010). The plan has been under consideration for weeks by the White House's Office of Management and Budget (OMB), which has an oversight role in setting budgets. NASA declined to comment on the cost-sharing aspects of the plan, but spokesman Trent Perrotto notes that five years of operational costs will bring the telescope's overall price tag up to \$8.7 billion. If the OMB rejects the plan, it ►

► would cast further doubt on whether the JWST will ever fly, because a House of Representatives committee has already voted, on 13 July, to cancel the telescope.

The drama surrounding the JWST is clearly on the mind of Bolden, NASA's highest official. On 2 August, before a meeting of the NASA Advisory Council began, Bolden told an assembly of dozens of advisers that the JWST is now one of the agency's top three priorities.

The first is to continue to support the development of commercial rockets able to carry people to and from the International Space Station in low-Earth orbit, a goal of companies such as Space Exploration Technologies (SpaceX) of Hawthorne, California. Second is the development of a heavy-lift rocket that can take astronauts beyond low-Earth orbit to reach objects such as nearby asteroids. Both of these activities would fall under the aegis of the Human Exploration and Operations Mission Directorate, which was formed on 12 August in a merger of the programme that operated the now-retired space-shuttle fleet and the programme that began the development of the Constellation rockets, part of the now-cancelled project to return to the Moon. That Bolden's third priority is the JWST "makes it clear that he's going to be fighting for it", says Alan Boss, an astronomer at the Carnegie Institution of Science in Washington DC and chair of a NASA astrophysics advisory subcommittee.

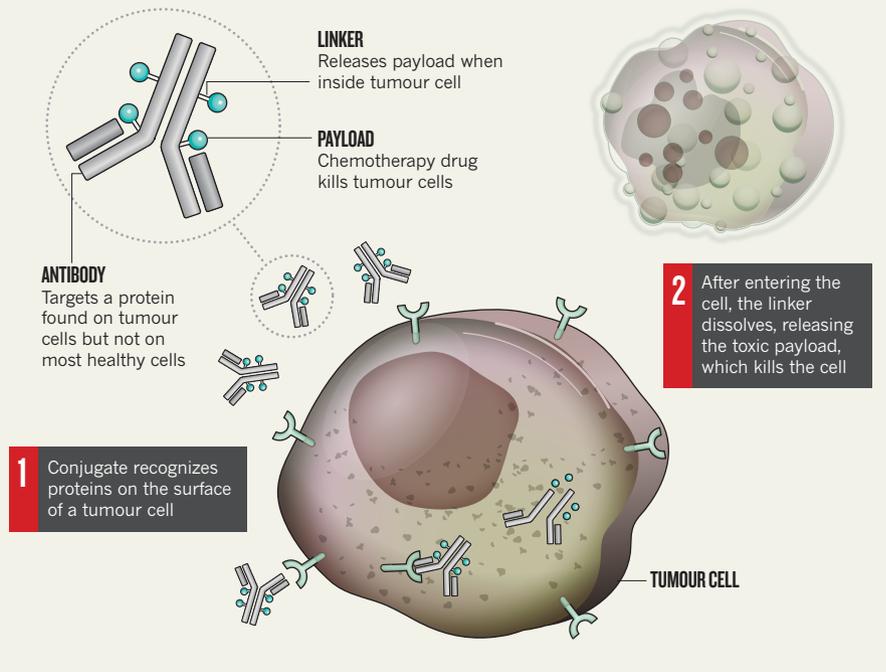
Even allowing for cost-sharing within the agency, lawmakers on Capitol Hill would have to cough up more money for NASA than recommended by the House committee if it is to turn all of Bolden's priorities into realities. In September, when Congress returns from recess, it is expected to resume the appropriations process for the 2012 fiscal year. All eyes will be on the Senate and Barbara Mikulski (Democrat, Maryland) to see how strongly she fights for the JWST project, which is being managed in her state.

If the OMB approves NASA's plan — and if lawmakers oblige by appropriating enough money — astronomers should consider themselves lucky. Some observers suggest that if the science division has to cover only half of the JWST's overruns, it could do so without delaying or cancelling any other missions.

But Brett Alexander, president of the Commercial Spaceflight Federation, says that shifting the cuts onto other parts of the agency will definitely hurt. He points out that scientists complained loudly in 2006 when money was redirected from science to support the Constellation rocket-building effort. "Now the science community may be looking for human spaceflight money to cover the science overruns," he says. ■

SEEK AND DESTROY

Scientists say that conjugates tethering a chemotherapy drug to an antibody are on the cusp of achieving clinical success for treating certain types of cancer.



DRUG DEVELOPMENT

Toxic antibodies blitz tumours

Tightly targeted cancer therapy receives marketing approval.

BY HEIDI LEDFORD

Eventually, Clay Siegall got used to doors slamming in his face. When the cancer researcher decided to create a company that would fight cancer using weaponized antibodies, investors were sceptical. "We contacted 35, then 40, then 45 venture-capital companies," he says. "We got turned down over and over and over."

Siegall and his partners kept trying, and 13 years later the investors who eventually bet on Siegall's company, Seattle Genetics, of Bothell, Washington, are getting their reward. On 19 August, the US Food and Drug Administration (FDA) approved the company's lead therapy, an antibody engineered to deliver a poisonous payload directly into lymphoma cells. The hope is that such antibodies, called antibody-drug conjugates, will sidestep the punishing toxicities of classical chemotherapies, which run loose in the bloodstream and kill healthy cells in addition to their targets.

Tim Illidge, an oncologist at the University of Manchester, UK, says that the approval is a "game-changer" for a promising class of drugs that has struggled to gain a foothold since it was first described in a 1964 *Nature* paper¹ (see 'A long time coming'). "We're essentially in a renaissance of the antibody-drug conjugate," he says.

Unembellished, or 'naked', antibodies are already used to treat cancer because of their unparalleled ability to target proteins found on the surface of tumour cells. Their high profit margins and strong patent protections have pharmaceutical companies clamouring for more. Siegall says that Seattle Genetics toyed with naked antibodies, too. "But by and large," he says, "most naked antibodies just don't have a strong, potent ability to knock out tumour cells."

Enter antibody-drug conjugates, which do have that knock-out punch. Their power comes from their payloads: lethal drugs tethered to the antibody that remain harmless until