PLoS ONE **5,** e15461; 2010). Also in 2010, a team at the University of Cambridge, UK, created a genetic circuit in bacteria that makes both firefly luciferase and luciferin, so that the bacteria glow continuously (go.nature.com/4nxcao). The Glowing Plant team plans to tweak the genes in that circuit so that they work in plants.

The more than 7,700 project supporters will also be rewarded with stickers, T-shirts depicting glowing plants or light-bulb vases. The effort hit its initial fund-raising goal of US$65,000 several weeks early, and passed the $400,000 mark on 28 May. With the extra cash, Evans and his team will try to create glowing roses too. They are taking no salary, and are borrowing lab and greenhouse space. "It's a really positive signal for synthetic biology that there's this big consensus-level interest in genetically engineered objects," says Mackenzie Cowell, founder of a San Francisco biotech-supply company called Genefoo. He chipped in $250 to the effort.

But Drew Endy, a synthetic biologist at Stanford University, questions how much light the plants will actually be able to emit, given the limitations on a plant's ability to harvest energy from the Sun and convert it back into light. "Never mind the genetic engineering involved — just what does the physics say about the feasibility of the project working out?" he says.

"Is this legal?" asks the project's Kickstarter site, with the reply "Yes it is!" Evans says that he and his team contacted the Animal and Plant Health Inspection Service (APHIS) at the US Department of Agriculture, which regulates genetically modified (GM) plants if plant pathogens are involved in the work. The agency's main concern was whether DNA from the pathogen *Agrobacterium* would be used to insert foreign genes, as GM plant efforts often do. "Regarding synthetic biologics, if they do not pose a plant risk, APHIS does not regulate it," a spokesperson told *Nature*.

To bypass this concern, the Glowing Plant team will use *Agrobacterium* only during preparatory tinkering with the luciferase genetic circuit. When plants are produced for distribution, the team will shuttle the genes into cells using a ballistics-powered device called a gene gun, a process that the agriculture department deems outside its purview (see *Nature* **475,** 274–275; 2011).

Such regulatory runarounds need to be scrutinized, says Todd Kuiken, who studies synthetic-biology issues at the Woodrow Wilson International Center for Scholars, a think tank in Washington DC. Although he has few concerns about streets lined with glowing *Arabidopsis*, he thinks that the lack of oversight of future, riskier projects could prove problematic.

And Allison Snow, an ecologist at Ohio State University in Columbus who studies the risks posed by GM plants, says that it won't do synthetic biologists any public-relations favours if plants make it into the wild. People will be more likely to support synthetic biology, she says, if it is associated with disease treatments or clean biofuels. "This is such a frivolous application," she says (see 'Bioluminescent boom').

Some people are riled already. The ETC Group, a Canadian pressure organization in Ottawa with a history of opposing synthetic-biology applications, launched a "kickstopper" campaign against the project and is looking into legal options to stop it.

Evans says that the team is likely to engineer a type of *Arabidopsis* that survives only if fed a nutritional supplement, reducing the chances of spread. And the team plans to conduct a public dialogue on the project's ethical, legal and environmental issues before shipping any seeds. "This is a fund-raising campaign," he says. "It's not the actual release of the plant."■

GLOWING REPORT

Bioluminescent boom

The Glowing Plant project is not the only foray into publicly available genetically modified organisms. Transgenic zebrafish (*Danio rerio*) that produce a fluorescent protein have been on the market since 2003, although their sale is not permitted in the European Union, Canada, Australia or California. And BioGlow, a commercial venture in St Louis, Missouri, informed the US agriculture department last year of plans to produce light-emitting plants, but the company has made few details public.

GENOMICS

Geneticists push for global data-sharing

International organization aims to promote exchange and linking of DNA sequences and clinical information.

BY ERIKA CHECK HAYDEN

It is a paradox that bedevils genomic medicine: despite near-universal agreement that doctors and geneticists should exchange more data, there has been scant movement towards achieving this goal.

Now, a consortium of 69 institutions in 13 countries hopes to address the problem by creating an organization to enable the free flow of information in genomic medicine. On 5 June, the consortium, which is calling itself the 'global alliance', announced that the organization will develop standards and policies to encourage data-sharing of a person's DNA sequence combined with clinical information. The alliance's founders are basing their model on the World Wide Web Consortium, which in the 1990s established standards for the programming language HTML and spurred the growth of web pages across the Internet.

"This alliance steps into what otherwise might be a real void," says Francis Collins, director of the US National Institutes of Health (NIH) in Bethesda, Maryland, which is a member of the alliance. For example, Collins says, there are no standards for storing genetic sequences or for assessing their accuracy.

NATURE.COM
For more on genetic data-sharing, see:
go.nature.com/5oxmj7

The alliance also hopes to tackle privacy and informed-consent issues that prevent researchers from sharing data, and plans to create a network of cloud-computing platforms and analysis tools in an effort to provide access to the shared data.

A big question for the group is whether it can convince institutions to share their most meaningful data. "The mission is unquestionably worthy," says cardiologist Eric Topol, director of the Scripps Translational Science Institute in La Jolla, California, which has not yet considered joining the alliance. But, he adds, "it means taking the walls down, and that's tricky — because you've got each centre wanting to hold on to its own data, and the loss of control is a very difficult concept".

The effort has gained support from some of the world's most influential sequence-data holders, including the NIH, the Wellcome Trust Sanger Institute in Hinxton, UK, and the BGI (formerly the Beijing Genomics Institute) in Shenzhen, China. David Altshuler, a geneticist at the Broad Institute in Cambridge, Massachusetts, who led an eight-person organizational committee for the project, is keen to add more members. "We're saying, 'This is bigger than any group or institution — let's figure

out how to get it right'," he says.

With the cost of sequencing falling with each passing year, the number of sequenced human genomes is now poised to reach into the millions. But researchers can't gain a complete picture of how genes influence disease unless those data are linked to clinical information and different institutions share data with each other.

Researchers are often reluctant to share this hard-won information, however. And on occasion, because of privacy concerns, they are legally prevented from doing so. That blocks scientists' ability to use the world's collective data to find answers to simple questions, such as how often a particular genetic variant is linked to a disease.

The establishment of technical standards for storage and sharing will go part of the way towards making genomic data easier to share and analyse. But the alliance also hopes to surmount some of the legal barriers by establishing how anonymity is handled and what information needs to be kept secure. Institutions that abide by core principles could then share data even if their policies differed in other, less central ways.

Moreover, the alliance wants to encourage the development of tools to allow patients to maintain control over their own medical and genetic data. Harold Varmus, director of the National Cancer Institute (NCI) in Bethesda, suggests that institutions should be able to tag their data so that it is accessible only for certain studies — a step that is "going to be incredibly important", he says.

Some major genomic-medicine projects have signed up to the alliance, but others have not yet joined, and have limited outsiders' access to their data. That is partly to head off privacy and security concerns, but also because the information is such a valuable commodity (see 'Precious data').

In the future, research funders such as the NIH and NCI could induce more projects to join by asking grantees to abide by policies set by the alliance, Collins and Varmus say. The project's success will depend on the alliance convincing organizations that it is worth giving up some control to gain access to a broader universe of data, says Michael Stratton, director of the Sanger Institute. "We're committed to the idea that sharing data will be central to extracting the maximum amount of knowledge for the benefit of humankind," he says. ■

PRECIOUS DATA

A 'global alliance' of research institutes wants to encourage sharing of linked genetic and clinical data, but not all of the major data holders have joined the project.

Project	Enrolled participants	Joined global alliance?
US Million Veteran Program	213,000	No
Vanderbilt University BioVU	165,000	No
Kaiser Permanente Research Program on Genes, Environment, and Health	430,000	No
UK10K	10,000	Yes
Deciphering Developmental Disorders	12,000	Yes

CONSERVATION

Europe reforms its fisheries

Agreement would set catch limits that are in line with scientific advice.

BY DANIEL CRESSEY

The breakthrough came at around 3 a.m. on 30 May in Brussels, after a marathon negotiating session: the European Union (EU) finally agreed to end overfishing in its troubled waters.

Fisheries scientists say that the deal, which is expected to be approved before the end of the year, could allow fish stocks to recover to their previous bountiful levels, after being driven down by years of overfishing. But short-term restrictions are likely to bring unemployment to some fishermen.

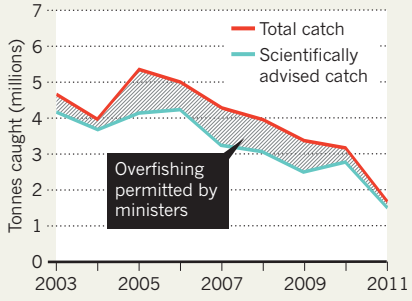
"There is bound to be some short-term pain," says Michel Kaiser, who studies fisheries at Bangor University, UK. "This reform has come about because there was a groundswell of realization that what we had before couldn't go on."

The deal places scientific advice at centre-stage in determining catch limits, as the EU commits to fishing at healthy levels by 2015 "where possible" and by 2020 otherwise. New rules will also be phased in to reduce ecologically damaging 'discards' — the practice of throwing fish caught in the pursuit of other species back into the sea, with the vast majority dying in the process.

For years, scientists have warned that more fish were being caught than was sustainable, owing to a flawed 'Common Fisheries Policy' (CFP), which governs commercial fishing in European waters. Government ministers set higher catch limits for cod, haddock and some other species than scientists considered wise (see 'A waning haul').The latest agreement, which has been several years in the making, is backed by the three arms of European government: the commission, parliament and council.

A WANING HAUL

European ministers have consistently ignored scientific advice in setting catch limits for 107 fish stocks in the northeast Atlantic fishery.



SOURCE: WWF, EU

Parliament had been pushing for a thorough reform of the CFP to put catches in line with what science says is sustainable, whereas the council — made up of ministers from EU member states — had been less amenable to radical change.

Environmentalists are generally pleased with the deal's main thrust: a commitment to fishing at maximum sustainable yield (MSY), the largest catch of a particular species that can be taken indefinitely without harming the main population. Scientists have two measures for MSY, obtained using mathematical models created with data from catches by commercial and research vessels: the overall biomass of a species needed to maintain MSY (B_{MSY}) and the annual amount of fish taken from that species that will still allow the species to reach B_{MSY} (F_{MSY}). Fishing at a higher level than F_{MSY} means the fishing is unsustainable in the long term. Environmentalists prefer B_{MSY} to F_{MSY} as a target, because reaching the former would show that a stock has actually recovered, whereas fishing in line with the latter indicates that a stock is on the road to recovery.

The EU agreement would set catch limits at F_{MSY} by 2015 where possible, and by 2020 in other cases. It has also promised to move to ▶