

## Plant biotech goes open-source

By Paul Rincon  
BBC News science reporter

**A team of scientists has developed an "open-source" alternative to one of the most effective - but patent-protected - ways of genetically modifying plants.**

Scientists need to pay for licences if they use *Agrobacterium* ; thought to be the only bacterium able to transfer foreign genes into plants.

But new research in Nature shows other bacteria can carry out gene transfer.

This could allow scientists to avoid the complex patent licencing process, which some say stifles innovation.

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Dr Richard Jefferson, Cambia

The properties of *Agrobacterium tumefaciens* allow scientists to engineer any desired genes into the bacterial DNA and then insert them into plant genomes.

Once transferred, these "transgenes" can endow plants with new characteristics, including herbicide or disease resistance, altered growth, nutritional qualities, or the ability to produce drugs and edible vaccines.

But *Agrobacterium* has hundreds of patents issued on it, with biotech giants Monsanto and Syngenta amongst the significant rights holders.

The microbe, which causes plant tumours in the wild, is used widely in research. But patent rights are rarely enforced until scientists decide to commercialise the fruits of their work.

### Patent process

"If you care one hoot about delivering it to the public, it's a big problem," said co-author of the new study Dr Richard Jefferson of research institute Cambia in Canberra, Australia.

"When there are dozens or hundreds of patents involved, negotiations can be labyrinthine - and all it takes is one denied right to stop the whole process."

In the new research paper, Dr Jefferson and his colleagues describe how they engineered benign bacteria capable of transferring genes into plants.

By introducing "disarmed" plasmids together with a helper molecule into bacteria, they were able to transfer genes into tobacco, rice and Arabidopsis plants.

The open-source method is not bound by the patent system. So scientists are free to use the technique without commercial restrictions, but must share any improvements they make to this scientific "toolkit".

### Unfinished business

"It isn't about making it cost-free or busting patents. It's about harnessing the latent creativity of a very large number of people who are out of the loop right now," said Dr Jefferson, a descendent of Thomas Jefferson, the third president of the US and also the country's first patent commissioner.

"I see this as unfinished family business," he told the BBC News website.

The team hopes this approach to managing intellectual property could jumpstart research into agricultural biotechnology in developing countries, addressing issues of hunger and poverty.

Markus Payer, a spokesperson for Syngenta, said the company would look carefully at the research but that it had no current business implications for the company.

"There are already other technologies around [for researchers to use]. This is not the first and only alternative to *Agrobacterium* ," said Mr Payer.

"We are contributing investment to agriculture and opening scientific findings for public and academic use."

### **'Important contribution'**

Dr Jefferson said initiatives like his own would benefit the marketplace, encouraging more competition and innovation. He cited IBM as a company that had made money out of the open-source model in software.

Praising the work, Dr Jeff Dangl, a plant scientist at the University of North Carolina in Chapel Hill, US, said the science was "very tight".

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*Agrobacterium***

Markus Payer, Syngenta

"This group's most important contribution...may well be to open up facile transformation of legumes, and other important crops for which *Agrobacterium* or expensive tissue culture-based methods are either inefficient or simply not possible," he commented.

Dr Wendy Harwood of the John Innes Centre in Norwich, UK, said the work "may open up more efficient ways of carrying out gene transfer".

The team behind the Nature paper has also launched a collaborative research platform on the internet called BioForge, which will allow scientists to develop new technology within a protected "commons".

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