



## An open future for biotech?

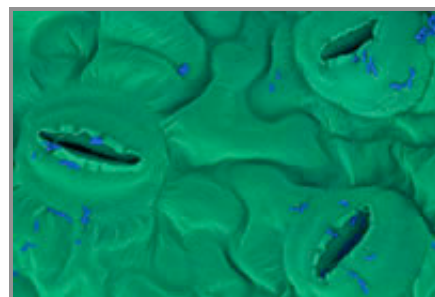
Rapid advances in biotechnology have brought in their wake an increasingly complex maze of patents and licensing. Large multinational companies are best positioned to navigate and exploit these arcane rules and restrictions. But, as the problems of the developing world are rarely high on corporate agendas, the benefits of biotechnology have yet to trickle down to the world's poorest people.

Now this sorry state of affairs may be set to change. A call has gone out to molecular biologists worldwide to join an 'open access' movement for biological innovation. Such a movement could level the playing field for researchers around the world, as well as stimulate innovation by encouraging wider participation. The founders of Biological Innovation for Open Society (BIOS) have proposed developing a suite of tools that are freely available under open-access licences. Modelled on open-source software licences, these protect the technologies and any improvements to them from restrictive patents, ensuring that they remain freely available to those who would use them.

To help launch this initiative, a new method of gene transfer was recently published in *Nature*\* that could come to compete with the widely used but highly patent-protected *Agrobacterium*-mediated gene-transfer technique. *Agrobacterium tumefaciens*, a soil bacterium, induces galls on plants by transferring a piece of its DNA. This discovery, a quarter of a century ago, laid the foundation for genetic engineering in plants. Today *Agrobacterium* gene transfer is the method most commonly used to transfer genes in plants (See [A clean pair of genes](#)).

### Move over, *Agrobacterium*

In their letter to *Nature*, researchers from the non-profit Australia-based Centre for the Application of Molecular Biology to International Agriculture (CAMBIA) report the discovery that other bacteria are able to transfer genes in plants. These include *Rhizobium*, *Sinorhizobium* and *Mesorhizobium*, representing two different families of bacteria, and the authors believe that the ability to transfer genes may extend to other bacterial species. The potential is high for developing new gene-transfer methods that would be accessible to all researchers worldwide. And such methods may also prove to be more applicable to the needs of developing countries.



credit: CAMBIA

"Many important crops, including species particularly relevant to the developing world, are difficult to transform by *Agrobacterium*," the authors state, going on to speculate that this may be because *Agrobacterium* evolved as a plant pathogen. They suggest that bacteria that interact with plants in different ways may offer new opportunities for some crops.

The authors express the hope that the method will be developed and improved through open collaboration with researchers around the world. They have made the technology available on BIOS's [BioForge.net](#) website under conditions modelled on open-source software development.

There are no restrictions to use of the technology other than an obligation to share improvements, safety information and regulatory data, and to preserve the opportunity for others to use and improve the technology freely. As in software development - where this approach has proved very successful and the resulting products sometimes compete with commercially developed software - the idea is to encourage creativity from as many sources as possible.

### Protected commons



credit: CAMBIA

Richard Jefferson, CEO of CAMBIA and leader of the BIOS initiative, believes that the future for biological technologies lies in such a 'protected commons', which will allow fair use of the technologies and at the same time stimulate much-needed innovation. "It's about dramatically increasing the size, quality and relevance of the community of innovators," he says. "At the moment many inventive people are prevented from applying their ideas to solving problems. We hope that will change."

BioForge.net is the BIOS platform for developing, improving and sharing new technologies. In addition to the new gene-transfer approach, the complete portfolio of CAMBIA's existing technologies is now available under the same open access arrangement via BioForge.net. Another BIOS initiative, BIOS Patent Lens, aims to inject clarity into the current patent landscape by providing a fully searchable database of patents supported by white papers, guides and tutorials. The third component of BIOS is a discussion forum for researchers - and participation is critical to the success of the initiative.

Together, the launch of BioForge.net and CAMBIA's new gene-transfer approach could mark the beginning of a new era for plant biotechnology, one characterised by worldwide sharing of ideas under fair rules that spread the benefits to the previously disadvantaged.

\*Broothaerts W. et al. (2005) Gene transfer to plants by diverse species of bacteria. Nature, vol. 433, pp. 629-33

For further information see [www.bios.net](http://www.bios.net) and [www.bioforge.net](http://www.bioforge.net)

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