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## **Genetic technology to produce cheaper ethanol from sugarcane**

Brisbane-based agbiotech company, **Farmacule BioIndustries** has today unveiled its groundbreaking genetic technology that will enable economically-viable ethanol production from sugarcane as an alternative fuel source.

Chairman Mr Mel Bridges, speaking from the BIO 2006 convention in the United States, said Farmacule and its research partner Queensland University of Technology had developed sugarcane plants that will allow more cost-effective ethanol production without compromising their commercial sugar potential.

He said the key component in producing the new plants, which are expected to improve the cost-effectiveness of ethanol production from sugarcane, was the Company's patented gene activation technology *INPACT*.

Farmacule and the QUT research team have modified sugarcane plants to include the *INPACT* technology and cellulases in the plant to enable highly efficient conversion of cellulose into fermentable sugars after crushing.

The remaining sugars can then be used efficiently to produce bioethanol, leaving the sucrose untouched and available for the consumer sugar market.

Mr Bridges said the concept, known as 'cellulosic bioethanol', is seen as the next generation of ethanol production techniques – as it aims to produce higher yields per hectare at lower costs than current techniques.

"Recently in the United States, President Bush touted the cellulosic bioethanol approach, suggesting that it may come to market within six years," he said.

"Farmacule's genetic technology will make this a reality, producing viable plants that contain the cellulase enzyme to enable the cost-efficient production of ethanol as a by-product of the sugarcane."

He said Farmacule's proprietary technology would use cellulase in the sugarcane leaf material to convert cellulose to fermentable sugars that could then be converted to bioethanol.

"The key to our approach will be to generate plants in which the over-expression of high levels of cellulase is tightly controlled, and activated when required, using our technology."

"Our approach also ensures that the sucrose that is used for consumer sugar is not sacrificed in any way – we would just be using the waste that's left after the sucrose is extracted," he said.

Professor James Dale, lead inventor of the technology and Director of QUT's Centre for Tropical Crops and Biocommodities said, while ethanol was an environmentally friendly alternative to fossil fuels, the challenge for researchers was to also make it cost-effective.

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Mr Bridges said the use of this technology in bioethanol production was an important development in alternative fuels and offered strong benefits for sugar producers and the local and international economies.

“Farmacule has been contacted by major international sugar producers interested in the biofuel applications of our technology and will look to use our skills and technology to develop a cellulosic bioethanol production system in sugarcane and probably many other crops,” he said.

Farmacule has worldwide exclusive rights to the technology platform, referred to as *INPACT* (‘In-Plant Activation technology’) developed by a team of leading researchers at QUT headed by Professor James Dale.

Professor Dale said that *INPACT* will be able to control the expression of the cellulases in plants, thereby ensuring the enzyme production mechanism is not activated until required.

As a result, the cellulases will be rapidly produced in the sugarcane, thereby negating the destructive impact cellulases have on the viability of plants.

“We see *INPACT* as the key enabling technology for large-scale commercial production of bioethanol from sugarcane in both Australian and overseas markets.”

### ***Ends***

For further information or an interview:

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\* High-resolution photos of Professor Dale are available from the QUT media unit.

## **About Farmacule**

Farmacule is developing molecular farming technology to cost effectively mass produce high-value proteins, biofuels and bioplastics in plants for various industrial, therapeutic and diagnostic applications.

Farmacule’s “In-Plant Activation technology” (INPACT) allows the insertion of a molecular switch into the basic operating machinery of a plant which can control the way proteins are produced, ultimately allowing large scale high value protein production. As a controlled gene activation and

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expression technology, INPACT also allows controlled switching and expression to facilitate the late-stage production of proteins that would normally be toxic to plants.

Visit [www.farmacule.com](http://www.farmacule.com) for further information.

## About Professor James Dale

Professor James Dale is a world-renowned plant biotechnologist with more than 25 years in the biotechnology research and development sector.

Professor Dale is the lead inventor of Farmacule's *INPACT* technology. In addition to his role as Acting CEO of Farmacule BioIndustries, he serves as the Chief Scientific Officer for the company. In that role, Professor Dale is personally leading a team of plant biotechnologists and researchers at QUT to develop existing and new applications of Farmacule's core INPACT technology. He is also Director of QUT's Centre for Tropical Crops and Biocommodities.

His prior achievements include the invention of FNC/GeneCo Technology, which was sold in 2000 by the CRC for Diagnostic Techniques and the Queensland University of Technology in a multi-million dollar deal to the world's leading gene chip company Affymetrix (NASDAQ: AFFX).

Professor Dale has published in excess of 70 research papers and contributed to the invention of more than six patents. He has also served as a member of Australia's Genetic Modification Advisory Council and, in 2001, helped draft national legislation to govern the genetic modification of organisms.

He is currently a member of the Gene Technology Technical Advisory Committee (GTTAC) in Australia.