

## GM TOMATOES HELP YOU SEE

A genetically modified tomato containing elevated levels of beta-carotene has been developed. An international team of researchers, headed by the University of London (UK) were involved in the project. Beta-carotene may be useful in reducing such chronic conditions as coronary heart disease, certain cancers and macular degeneration - a leading cause of blindness. Beta-carotene is a precursor of vitamin A. The United Nations agency, Unicef, estimates that improved vitamin A nutrition could prevent between 1-2 million deaths annually among children under 4 years of age. The researchers transferred the carotenoid gene (*cr1*) from the bacterium *Erwinia uredovora* to the tomato plant. *Cr1* encodes the enzyme phytoene desaturase, an important intermediary step in the biosynthesis of beta-carotene. The gene transfer did not affect the growth and development of the tomato plant and the fruit had twice the amount of beta-carotene of standard tomatoes. It is hoped that the new transgenic tomato may help ensure that people get an adequate supply of vitamin A.

Monsanto, has decided to offer



royalty-free licenses to enhance the development of its GM rice enriched with vitamin A. The company scientists transferred a series of genes to rice to construct the necessary pathway for beta-carotene synthesis. It is the first time that a trait requiring more than one gene has been successfully transferred into a plant. The vitamin A enriched rice has a distinct golden colour and is known as **Golden Rice**. It is hoped that the licenses will enable the beta-carotene pathway to be transferred more rapidly to the various strains of rice grown throughout the world and reduce the legal implications of the use of proprietary techniques.

### From the Editor

Welcome to the fourth edition of *Asia Biotechnology Forum*, a monthly online newsletter providing news and information on the events affecting biotechnology in Hong Kong and Asia. This newsletter is provided with the compliments of Hong Kong DNA Chips Limited.

In this issue we focus on GMOs - from new regulations in Australia and New Zealand, to vitamin - enriched tomatoes and slow growing lawns.

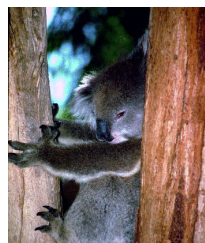
In addition, the response of the HKSAR Government to private DNA testing of right of abode claimants is reported.

## GM grass takes root

A company in the US is planning to market a genetically modified slow-growing grass in the next few years. The grass, developed by Scotts Company, is intended primarily for use in golf courses, parks and public gardens, where grassed areas have to be well maintained year round.

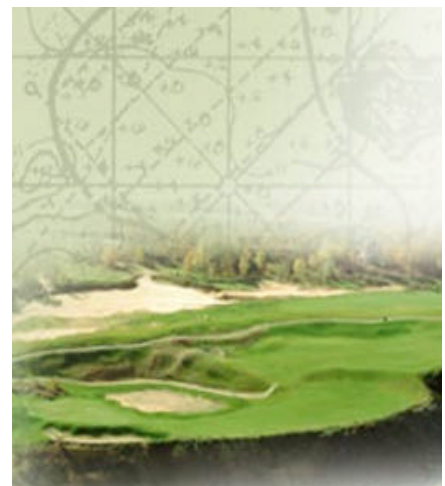
## Australia/NZ GM labelling review

Health ministers from each of the Australian states and territories met in New Zealand at the end of July to discuss the labelling of genetically modified (GM) foods. The Australia New Zealand Health Council adopted a policy that will require labelling on virtually all foods in both countries. A number of foods are exempted from labelling, including food accidentally contaminated during transport and food served in restaurants. A year ago, health ministers in Australia first proposed a comprehensive standard that would require foods with more than 0.1% of GM ingredients to be labelled. These



proposals were strongly opposed by farming representatives and food retailers who feared that it would raise costs and result in job losses.

In Hong Kong, GM labelling regulations are not yet in force. However, several local companies are able to test for GMO ingredients.

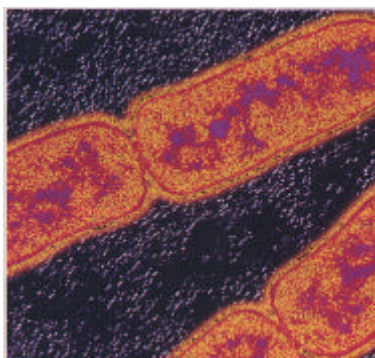


## Government NO INTENTION of allowing private DNA tests for right of abode



In a letter to the editor of **Asian Biotechnology Forum** on 27 July, a representative of both the Chief Executive, Mr Tung Chee Hwa, and the Secretary for Security, Mrs Regina Ip, confirmed that the Hong Kong Government has **..no intention to delegate any part of the taking and/or testing of tissue samples in our genetic test procedure to private laboratories...** The spokesman further commented, **..we consider it essential for the entire test to be placed under the direct supervision of the Government to ensure control and prevent abuse..** The letter came in response to a call from concerned elements of the biotechnology sector in Hong Kong to allow private companies to conduct at least some of the many

thousands of genetic tests expected to result from the processing of right of abode claimants. A major element of the procedure is that the child is tested in the mainland whilst the parent is tested in Hong Kong. The results are then compared and a decision made as to whether a match is obtained. The Government spokesman did not accept that the testing procedures to be adopted by the Government Laboratory in Hong Kong and the Criminal Technology Division of the Guangdong Provincial Public Security Department were flawed, despite comments from the Dean of Science of the University of Hong Kong, Dr Frederick Leung Chi-ching, that testing different samples went against accepted protocols and left the results open to legal challenges. The Government also does not accept that the subsidised tests are conducted at the expense of the taxpayer, despite the fact that the Government Laboratory is being expanded specifically to deal with the influx of mainland migrants. Whilst restating that the Government remains committed to making Hong Kong an international hub for high technology and encouraging the development of high-tech companies, much more could be done to encourage the fledgling biotechnology sector in Hong Kong.



common research bacterium, *E. coli*. The altered *E. coli* acquired the ability to break down  $C_2Cl_4$ , thus confirming the hypothesis. The use of such an organism has great promise in cleaning up waste sites contaminated with a range of chlorinated chemicals - a process known as bioremediation.

### Disclaimer:

The information contained in this newsletter is derived from a variety of sources. Whilst every effort is made to ensure accuracy, HKDNA Chips makes no claims as to the veracity of the information presented.

## Corporate information

We hope you enjoyed this edition of **Asian Biotechnology Forum**. If you have any news or topics you would like to see featured in upcoming editions, or you have any comments or queries we would be pleased to hear from you.

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## Next Issue

### In ABF November we will focus on

- Edible vaccines
- Apple antioxidants
- GM flowers
- GM testing at HKDNA Chips

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## Waste - removing bugs

Environmental pollution is a growing concern and efforts are being made to address the problem using biotechnology. One of the biggest concerns is the widespread use of compounds resistant to degradation. Tetrachloroethylene ( $C_2Cl_4$ ) is an industrial degreaser, fumigant and dry-cleaning solvent. It is a common pollutant of groundwater and is a suspected human carcinogen. It does not occur naturally and was considered to be completely non-biodegradable in the presence of oxygen. As a result, it tends to persist in the environment if spilled and expensive chemical treatment is the only way it can be satisfactorily removed. However, a team at the University of Connecticut (USA) has isolated a bacterium from sludge at a wastewater treatment plant that can degrade  $C_2Cl_4$  aerobically. The bacterium, *Pseudomonas stutzeri* OX1 converts  $C_2Cl_4$  into harmless chloride ions. It can also break down other chlorinated compounds, such as trichloroethylene, dichloroethylene and vinyl chloride. The degradative activity is thought to be due to the enzyme toluene-*o*-xylene monooxygenase. The group isolated the gene encoding the enzyme from *P. stutzeri* OX1 and introduced it into the