

GM testing at Hong Kong DNA Chips

Despite the lack of regulations on the labelling of foods in Hong Kong, the testing of GM (genetically modified) products and ingredients is increasing rapidly. Recently, the Hong Kong press ran a major story about the discovery of a GM ingredient in three well-known fast food outlets. The result was great public concern and embarrassment for the companies. The testing was commissioned by a local environmental group and conducted at the state-of-the-art laboratories of Hong Kong DNA Chips Ltd in Kowloon. The testing revealed the genetic signature unique to a type of modified soybean. The soybean had been modified to be resistant to a herbicide. The GM soybean was found in bread samples supplied to the fast food outlets from a Hong Kong bakery. As soybean is not a usual ingredient of bread, it likely came from accidental contamination at some stage during manufacture. Four out of 11 random sam-



ples tested positive. The remainder were all negative. The high sensitivity of the GMO test makes it applicable not only to confirming the GMO status of foods for labelling purposes, but also for monitoring internal quality assurance procedures. Increased consumer awareness of green and especially GMO issues is increasing and labelling regulations in Hong Kong are likely in the coming years.

YOUR MUM WAS RIGHT!

It's official. Your mum was right (not to mention Granny Smith!) An apple a day may well keep the doctor away. New research on fresh apples shows that they are effective in combating certain forms of cancer. Researchers at Cornell University (USA) have found that the antioxidant activity of fresh apples is due primarily to the high concentrations of particular phytochemicals, namely flavonoids and phenolic acids present in the unpeeled fruit. One of the mechanisms of damage to the body is thought to be reactive oxygen species (ROS) that damage proteins and DNA at the molecular level. ROS can be inhibited by antioxidants. Vitamin C is a proven antioxidant and is also reputed to have anti-cancer properties. However, other studies show that excessive intake of vitamin C may actually promote cellular damage. The Cornell group found that 100g of fresh apples have the same antioxidant activity as 1.5g vitamin C.



In fact, the phytochemicals in the unpeeled fruit had 260 times the antioxidant activity of the vitamin C present in the fruit, indicating that the antioxidant activity of apples is almost entirely due to the phytochemicals. The group then treated colon cancer and liver tumour cells with apple extracts and found that cell proliferation was inhibited. As a result, eating whole fruits containing a mixture of phytochemicals may provide sufficient antioxidant activity needed to combat ROS and has the added advantage of eliminating the potential toxic effects of excess vitamin C supplementation.

From the Editor

Welcome to the fifth 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 look at food — antioxidants in apples and vaccines in GM potatoes. GM flowers are discussed and a case of GM soybean in fast food is examined. We also report on a recent GM food testing workshop held in Hong Kong.

SIDE STORY

GM Blues

Plants are also being modified for purely aesthetic purposes. Florigene Limited, a company based in Melbourne, Australia, has successfully created two varieties of blue carnation. The gene determining blue coloration in petunias has been inserted into the carnation allowing the production of blue flowers. Moon dust, launched in 1996, is a



light mauve colour. Moonshadow, launched in 1997, has greater expression of the blue gene, and is a deeper violet colour. The technique is also being applied to roses, gerberas and lilies — plants that lack a natural blue variety. The company is also investigating genes that limit plant wilting after harvest.

Edible vaccines

Researchers in China have developed a strain of genetically modified potatoes that protect people against hepatitis B virus (HBV). The announcement brings forward the reality of an "edible vaccine" that has been under development in China and the United States for nearly a decade. The modified potato contains a gene that produces a protein normally found in the outer membrane of HBV. Exposure to the HBV protein triggers an immune response similar to that produced by standard immunization. The modification does not affect the nutritional composition of the potato. After successful testing in mice, the project is ready to proceed to human trials. It is estimated that 20 million people in China are carriers of HBV. Axis Genetics (UK) has been



researching the feasibility of edible plant vaccines for diseases such as diarrhea, cholera and Norwalk virus for many years. Other researchers are engineering vaccines in plants such as broccoli, turnips and Brussels sprouts. Edible vaccines will probably have the same efficacy as injected vaccines, but will be cheaper and easier to transport.

GM workshop well attended

Hong Kong DNA Chips Ltd played host to many of the region's top food manufacturers and distributors when they participated in a workshop on "Genetically Modified Food Testing". The workshop, held on 31 August, was the first of its kind presented in Hong Kong by a commercial biotechnology company.

GMOs (genetically modified organisms) are currently a major issue in the food industry. Green groups and the general public regularly voice their concern at the perceived widespread use of GM ingredients in food and drink.

The aim of the workshop was to inform the food industry of the procedures involved in testing products for the presence of GM ingredients. Attendance at the workshop was by invitation only.

Terence Lau, General Manager of Hong Kong DNA Chips Ltd, said, "Testing for GM ingredients should not be a burden for food companies. It can be routinely incorporated into a regular quality assurance programme."

Representatives from 10 different companies attended the workshop, which included a visit to the company's state-of-the-art laboratory facilities. Dr Peng Liang, Laboratory Director, addressed the issue of confidentiality and anonymity by noting,



"We take great care to ensure that all the samples we receive are properly documented. Each sample is assigned a random security code that is used to identify it throughout the testing procedure. The staff performing the test do not know the type of food that is being tested or where it came from. Only when the final report is being prepared is the security label decoded and the sample identified."

The invited guests were impressed with the facilities available at the company and several orders for GM testing were received in the days following the workshop. It is expected that these workshops will become a regular event.

Labelling of GM foods is not yet required in Hong Kong. However, the food industry representatives participated fully in the workshop and asked numerous questions. It is clear that the food industry in Hong Kong is taking a pro-active stance when it comes to obtaining information about GMOs and testing.

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 December we will focus on

- A new marker for GM crops
- GM crops - a bright future?
- Genome of TB bacteria sequenced.

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