



PRESS RELEASE – 5 SEP 2009

(For Immediate Release)

“Students Reporters” Created Video Clips Aimed at Educating Singaporeans on the Facts and Myths of Genetically Modified Foods

130 students from 20 local secondary school interviewed Residents of the Singapore Heartlands for their perceptions towards genetically modified (GM) foods, and created video clips aimed at demystifying gene modification technology, genetically modified organisms (GMOs) and GM foods, as they competed in the GMAC Student Reporters’ Challenge 2009. Shortlisted entries to the competition were screened on 5 Sep 2009 to an audience of about 200 people.

1. The GMAC Student Reporters’ Challenge 2009 is the latest initiative by the Genetic Modification Advisory Committee (GMAC) in enhancing public awareness of matters related to GM technology and GMOs. In groups of fives, a total of 130 students from 20 secondary schools in Singapore participated in the competition, which required them to interview Residents of the Singapore Heartlands for their views towards GM foods, and to create educational video clips to present facts and debunk myths on the subject matter.

2. Professor Lee Sing Kong, Chairman of the GMAC Subcommittee on Public Awareness and Director of the National Institute of Education (NIE), said: “Students in Singapore learn about GM technology and GM foods in schools, but their capacity for more knowledge seems boundless. We have seen students’ enthusiasm to learn more about the science and applications of GM technology through, for instance, the many interviews requests that we accepted from them over the years. We feel that it is now time for Singapore students to share what they have learned with others. Through the GMAC Student Reporters’ Challenge 2009, we bring students out of the classrooms and into the Heartlands, for them to investigate what the average Singaporeans know about GM foods, and to give them the responsibility to correct any misconceptions that the public may have on the topic.”

3. All video clip entries to the competition were received in Jul 2009, after which they were reviewed by Preliminary Judging Panels comprising representatives from the Agri-Food and Veterinary Authority, the Ministry of Education, and the five Polytechnics’

Schools of Life Sciences (or equivalent). For each of the two competition categories (Lower and Upper Secondary categories), three entries were then shortlisted for progression to the Final Judging.

4. The Final Judging took place on 5 Sep 2009 at a Video Screening Session held in Biopolis, during which the shortlisted entries were viewed by an audience of over 200 students, teachers, and members of the public. The Agri-Food and Veterinary Authority (AVA); the Nanyang Technological University (NTU); the National University of Singapore (NUS); the Temasek Life Sciences Laboratory (TLL); and the Singapore Press Holdings (SPH), were represented on the Final Judging Panel.

5. “Average lay persons may usually find the subject of GM foods a rather dry one, as the scientific aspects of the topic can get quite technical. However, by employing a variety of different innovative methods, such as through the use of cartoons and animations, participants of the GMAC Student Reporters’ Challenge 2009 have created educational videos that present scientifically-accurate information in forms that can be much more easily appreciated by the “Heartlanders” of Singapore,” said Dr Choo Li Nah, who is Acting Director of the Policy and Corporate Communications Department of the AVA, and a member of the Final Judging Panel.

6. “I am very proud of the Student Reporters. They have indeed rose up to the Challenge,” added Prof Lee Sing Kong.

7. In line with GMAC’s neutral stand towards GM foods and focus on sound science, objectivity and scientific accuracy of information presented in the video entries weighed heavily in the judging criteria. Credits were also given for creativity, as well as for entertainment and aesthetic appeal, as these qualities are important for capturing a lay audience’s interests in the information being presented in the video clips. Each member present at the 5 Sep 2009 Video Screening Session was additionally invited to vote for his or her favourite entries, with votes from the audience contributing up to 10 per cent of the final score of each shortlisted entry.

8. GMAC congratulates Unity Secondary School and Raffles Institution, for clinching the top honours of, respectively, the Lower and Upper Secondary categories of the GMAC Student Reporters’ Challenge 2009. Each of the two groups of the students walked off with a cash prize of \$1,000. Please refer to **Annex A** for the list of recipients of all the awards of the competition.

9. When asked to share her thoughts on participating in the GMAC Student Reporters' Challenge 2009, Poon Yu Hui of Unity Secondary School said "in creating the video clips, we went around to interview average Singaporeans for their views towards GM foods. Some of the interviewees clearly have many misconceptions - some of which I find very bizarre - towards GM foods. For instance, there was someone who was concerned that by eating GM foods, he may grow additional legs and arms! I am happy that even though I am still a student, I am able to do my part in helping to educate the public on GM foods, through the GMAC Student Reporters' Challenge. I hope that the audience present at today's event have found my team's video clip informative!"

10. The students' video clips helped to bust some of the common myths towards GM foods. Besides the screening of the shortlisted entries, the Video Screening Session also featured a Question and Answer component, where an expert scientific panel answered questions posed by the audience, to further provide facts and debunk myths on GM technology, GMOs, and GM foods.

11. Please refer to **Annex B** for GMAC's responses to some of the commonly-asked questions on GM foods.

12. "Prior to attending this event, I didn't have much ideas about GM foods, but I thought that perhaps GM foods could contain more chemicals or may be less nutritious than non-GM foods. Today, I learned from the video clips that actually, some of my previous thoughts (about GM foods) might not have been quite accurate. The expert scientific panel also gave us a balanced view about the safety considerations and reality checks concerning GM foods," said Mrs Agnes Chua, who attended the Video Screening Session in support of her daughter who competed in the GMAC Student Reporters' Challenge 2009.

Encl:

- i) Annex A – List of Award Recipients for the GMAC Student Reporters' Challenge 2009
- ii) Annex B – Answers to Some Commonly-Asked Questions on GM Foods
- iii) Annex C – Member Compositions of the Final Judging & Expert Q&A Panels at the Video Screening Session

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About GMAC

The Genetic Modification Advisory Committee was established under the purview of the Ministry of Trade and Industry in April 1999 to oversee and advise on the research and development, production, use and handling of Genetically Modified Organisms (GMOs) in Singapore. The Committee currently consists of members drawn from various government agencies, universities, research institutions, and a consumer interest group.

GMAC's objective is to ensure public safety while allowing for the commercial use of GMOs and GMO-derived products by companies and research institutions, in compliance with international standards. In this regard, GMAC has published the Singapore Guidelines on the Release of Agriculture-Related GMOs and the Singapore Biosafety Guidelines for Research on GMOs. GMAC has also taken on a role in the creation and enhancement of public awareness of GMOs and GM-related issues, through the dissemination of scientifically-sound information on relevant subjects, from an objective viewpoint.

Issued by GMAC

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Award Recipients for the GMAC Student Reporters' Challenge 2009

The Genetic Modification Advisory Committee (GMAC) congratulates the following schools for clinching the honours of the GMAC Student Reporters' Challenge 2009:

- ***For the Lower Secondary Category:***

1st Prize – Unity Secondary School

2nd Prize – NUS High School of Mathematics and Science

3rd Prize – CHIJ St Nicholas Girls' School

Merit Awards* – Hong Kah Secondary School; River Valley High School

- ***For the Upper Secondary Category:***

1st Prize – Raffles Institution

2nd Prize – Nanyang Girls' High School; and Hwa Chong Institution

Merit Awards* – Canberra Secondary School; Yuan Ching Secondary School

*(*The recipients of the Merit Awards were determined based on scores from the Preliminary Judging of all entries.)*

**Answers to Some Commonly-Asked Questions on
Genetically Modified (GM) Foods**

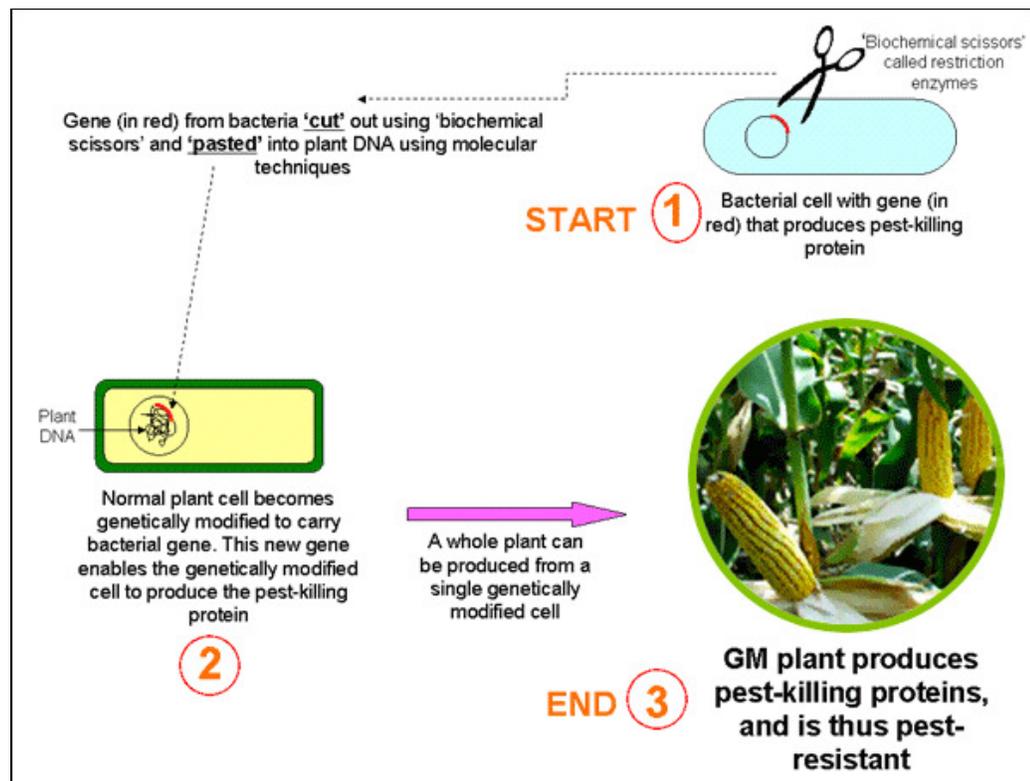
1) What is genetic modification and what are GM foods?

Deoxyribonucleic acid (DNA) is the blueprint determining the characteristics of living organisms. The characteristics of living things are determined, to a large extent, by the DNA present in their cells. DNA occurs in long, double-helical chains, and specific segments of the DNA chain that are responsible for particular traits are called genes.

“Genetic modification”, literally, means the alteration of an organism’s genes through modern molecular techniques. With the advancement of technology, scientists can now make use of special biochemical “scissors” (i.e. “restriction enzymes”) and “glue” (i.e. “DNA ligases”) to “cut” and “paste” genes from one living thing to another. The newly introduced DNA brings new characteristics to the host organism.

Genetically modified organisms (GMOs) are plants, animals or microorganisms whose DNA has been altered through the introduction of one or more selected genes by molecular techniques. GM foods refer to foods derived from GMOs.

Genetic modification is being applied to develop new benefits, such as in creating crop plants with greater resistance to pests. The diagram below provides a simplified representation on how an originally pest-susceptible plant can be genetically modified to carry a bacterial gene which makes it pest-resistant.



2) Which are the most common types of GM foods?

According to the International Service for the Acquisition of Agri-biotech Applications (ISAAA), the principal GM crop grown in 2008 was GM soybean, followed by GM maize, GM cotton, and GM canola. These four principal GM crops take up more than 99% of the global hectareage of GM crops. GM varieties of other plant species, such as tomatoes and sugar beet, have also been developed, albeit a lot less commonly than the four principal GM crops.

To date, there has been no official approval of GM livestock for commercial use.

3) What are some of the potential benefits that can be derived from GM crops/foods?

GM crops commercially available in the world market today have been most commonly modified to exhibit agronomic traits such as pest-resistance and herbicide-tolerance. Some people say that the adoption of pest-resistant GM crops can have a beneficial impact on the environment, by limiting the need for spraying of chemical pesticides. There has also been reports indicating that pest-resistant GM crops can have lower levels of mycotoxins – which are chemicals made by molds that can be detrimental to human health – apparently due to reduced pest damage to the crops.

Scientists and biotechnology companies are also working to develop GM crops with other properties, such as:

- enhanced nutrition content (e.g. pro-vitaminA-rich “Golden Rice”);
- high-yield;
- “hypoallergenicity” (e.g. “hypoallergenic” peanuts); and
- ability to survive under harsh environmental conditions (e.g. drought-tolerant varieties).

Some people are hopeful that GM crops can potentially help to alleviate the pressures on food production exerted by a growing world population and the effects of climate change. On the other hand, there are people who hold different views and who are skeptical towards the potential benefits of GM crops. For instance, some are worried, from the environmental conservation point of view, that the cultivation of GM crops, if practiced without the necessary precautions, may lead to “gene flows”, where foreign genes are transferred from the GM crops to their wild relatives. Yet others are concerned on the safety of GM foods (see Questions and Answers below).

4) Are GM foods injected with chemicals or hormones?

GM crops/foods have not been injected with any more chemicals or hormones as their conventional counterparts. As explained in our answer to Question (1), GM crops are plants whose DNA has been altered through the introduction of one or more selected genes by molecular techniques. The genetic modification process per se does not involve the injection of chemicals or hormones.

5) Are GM foods more or less nutritious than their conventional counterparts?

Most GM crops/foods available in the world market to date have been bioengineered to express agronomic traits such as pest- and herbicide-resistance and do not differ significantly from their conventional counterparts in terms of nutritional contents.

Nonetheless, scientists and biotechnology companies are working to develop new

varieties of GM plants with enhanced nutritional contents. Several varieties are in the pipeline for regulatory approval. One example is the “Golden Rice”, which is rich in pro-vitaminA.

6) If I eat GM foods, will the foreign genes enter my cells and make me genetically modified too?

All plants, animals, and bacteria, whether GM or not, have DNA. Hence, most plant- and animal-based foods, whether derived from GMOs or not, will also contain DNA. Biochemically, the DNA present in all living things take on similar structures and are built up from the same basic components. If one considers the recombinant DNA present in a GM food as being “foreign” to humans, it must also be noted that the “original” plant or animal DNA present in a non-GM food are also not endogenous to humans.

Food processing may cause the DNA present in foods to become fragmented. When a food is ingested, the DNA present in it will also be subjected to digestion in our gastrointestinal tract. Studies have shown that recombinant DNA, like original DNA, is rapidly broken down in the gastrointestinal tract of animals and humans. Since recombinant DNA, like original DNA, is rapidly digested in the stomach, it is unlikely that any functional DNA can become absorbed and integrated into human cells. According to reliable current studies, no recombinant DNA fragments derived from GM plants have been detected in tissues of animals fed GM feeds. To quote the European Food Safety Authority’s conclusion on one such studies, “recombinant DNA did not survive passage through the intact gastrointestinal tract of healthy human subjects fed GM soya”.

7) Are there any established side effects from consuming GM foods? What are some of the health concerns?

Since the commercialization of the first GM crop more than a decade ago, there has been no substantiated report of health hazards resulting from the consumption of foods derived from such crops.

Nonetheless, some remained concerned about whether the consumption of GM foods may lead to allergenic reactions, toxic effects, illnesses, or unknown side effects or health hazards. The opposite view - maintained as strongly - is that GM foods are as safe as, if not safer, than conventional foods.

While the debate continues, many countries have adopted a more conservative approach and subject GM foods to even more rigorous pre-market assessment than their conventional counterparts. At the international level, the Codex Alimentarius Commission, which is a joint body under the World Health Organization (WHO) and the Food and Agricultural Organization (FAO) of the United Nations, has established international guidelines which describe how GM foods are to be assessed for, among other things - potential toxicity; potential allergenicity; substantial nutritional and compositional equivalence with conventional counterparts; unintended effects that could result from the gene insertion, etc. Under the international guidelines, a GM food is only approved and allowed onto the world market after the assessments indicate that it is safe for consumption.

The WHO, the European Food Safety Authority, the Royal Society of the United Kingdom, are among the international and national bodies that have concluded, after extensive reviews of available scientific information, that currently available GM foods

thus far developed and marketed, according to standard risk evaluation procedures, are not inherently less safe than their conventional counterparts.

8) What are the local authorities doing to ensure that GM foods sold in Singapore are safe for consumption?

In Singapore, the Agri-Food and Veterinary Authority (AVA) is the national authority on food safety for both primary and processed foods. The AVA understands the need for foods sold in the market, whether GM or not, to be safe for consumption. It has established a comprehensive and integrated system to ensure the safety of foods, whether or not they are derived from GMOs. Foods found or suspected to be unsafe, whether GM or not, will not be approved for the market.

As mentioned in the answer to Question (7) above, international guidelines has been established for the safety assessment of GM foods. Singapore follows these guidelines, so as to conform to good practices. In addition, GMAC has, since 1999, developed guidelines for the safety assessment of applications to release agriculture-related GMOs in Singapore. Through a scientific panel, GMAC conducts science-based assessment of applications to market GM foods in Singapore. In assessing and approving GM food products for consumption in Singapore, the AVA considers the recommendations of GMAC and also carries out its own review based on the international guidelines established by the Codex Alimentarius Commission.

The Singapore authorities will remain vigilant on the issue of GM food safety. The AVA and GMAC will continue to monitor relevant scientific developments closely.

**FINAL ROUND JUDGING PANEL
FOR THE GMAC STUDENT REPORTERS' CHALLENGE 2009**

<ul style="list-style-type: none">• Ms Chang Ai-Lien	Assistant News Editor Science Correspondent The Straits Times; & Member GMAC Subcommittee on Public Awareness
<ul style="list-style-type: none">• Assoc Prof Lim Tit Meng*	Associate Professor Department of Biological Sciences Faculty of Science National University of Singapore
<ul style="list-style-type: none">• Assoc Prof Peter Dröge*	Head Genomics and Genetics Division School of Biological Sciences Nanyang Technological University; & Chairman GMAC Subcommittee on the Release of Agriculture-related GMOs
<ul style="list-style-type: none">• Dr Hong Yan*	Director (Plant Biotechnology) Temasek Life Sciences Laboratory; & Member GMAC Subcommittee on the Release of Agriculture-related GMOs
<ul style="list-style-type: none">• Dr Choo Li Nah	Acting Director Policy and Corporate Communications Department Agri-Food & Veterinary Authority of Singapore; & Member GMAC Subcommittee on Public Awareness

****Assoc Prof Lim Tit Meng, Assoc Prof Peter Dröge, and Dr Hong Yan also served on the Expert Panel for the Question and Answer component of the 5 Sep 2009 Video Screening Session of the GMAC Student Reporters' Challenge 2009. The moderator was Prof Lee Sing Kong, who is Chairman of the GMAC Subcommittee on Public Awareness and Director of the National Institute of Education.***