

Our Vision

To be a leading centre for training, education and applied research in the chemical and life sciences.

Our Mission

To continuously seek innovative ways to train and educate school leavers and the workforce, and to carve niche applied research areas that will benefit students, industries and the community.





AScientia

Passion To Make It Happen!

Issue No.6

School
of
Applied
Science

**Glycemic
Index**



TEMASEK
POLYTECHNIC

bringing education to life and life to education

contents

August '09 - December '10 | Issue No.6

Cover Story 12

Accredited GI Research Unit
- A First in Asia-Pacific Region

Features

- The Choice KI 2
- Centre for Traditional Medicine 3
- The Green Grip 18
- A Homecoming 25

Industry Connected! 6

Specialist Diploma in Biopharmaceutical Technology
Pet Care & Management Training
Customised Nutrition Workshop

Education Alive!

- Pedagogical Practice 8
- Awards & Accomplishments 16
- Contributing to Community 22

AScientia

Passion to make it happen!

A combination of the acronym 'Asc' for our School of Applied Science and the Latin word *scientia* which means knowledge, science and skill.

Editorial Team

Jocelyn Lee
Sumitha Ramachandra

Adviser

Lim Teng Kuan

We would like to extend our appreciation to all who helped in the production of this magazine.

Publisher

Temasek Polytechnic,
School of Applied Science

Designer

99 Degree Communications LLP



AScientia
Passion To Make It Happen!

Singapore's position as an emerging hub of world class scientific research presents unprecedented opportunities not only for aspiring scientists, but also companies and institutions that are ready to leverage on these exciting developments.

DIRECTOR'S Message



In tandem with these advances at the national level, the Temasek Polytechnic School of Applied Science has identified three key areas of focus as we move into the next phase of our development: integrating technological capabilities, translating intellectual properties and serving local industries.

It is our passion for science and research that has enabled us to push ahead and pioneer new activities, specifically in research and product development. The **Glycemic Index Research Unit**, the first certified GI testing centre in the region, as well as the **Centre for Traditional Medicine**, typify our philosophy of integrating capabilities and translating research in order to offer the best solutions to industry. Both offer consultancy services as well as conduct applied research for our industry partners.

At the same time, these cutting edge R & D activities serve to enhance the basis of our academic excellence and add value to our educational process in Temasek Polytechnic.

We are also strengthening our capabilities and expertise in the following clusters: food technology, aquaculture, agro biotechnology and biomedical science. While we have successfully collaborated with many companies, organisations and other institutes of higher learning in these and other areas, partnership and collaboration with industry will remain a key focus in the years ahead.

Whether you are a local start-up or a global leader in your field, if you share our desire to innovate and break new ground, we invite you to leverage on our strengths and experiences as we continue to expand our core capabilities. Together, our collaboration can bring products and solutions from the laboratory to the living space to make life better!

Dr Lee Chee Wee | *Director,
School of Applied Science*



THE CHOICE KI

Dr Ting Dor Ng
Assistant Director,
Technology Development

Contact Details:
T. 6780 6425
E. dnting@tp.edu.sg

Temasek Polytechnic School of Applied Science has been designated by 11 different **Small and Medium Enterprises (SMEs)** as the **Knowledge Institution (KI)** from whom they wish to seek technical expertise. This represents almost 10 percent of the total projects awarded during the first grant call of 2010, a strong endorsement of our School's strength in conducting applied R&D relevant to industry.

Innovation Voucher Scheme (IVS) is an initiative of SPRING SINGAPORE to connect public Knowledge Institutions (KIs) with SMEs to develop innovative ideas. Under IVS, SMEs can apply for an innovation voucher worth \$5000 from SPRING to pay for consultancy and technology services. Participating KIs include polytechnics, universities,

A*STAR RIs and ITEs.

Among the projects that reflect our school's established and emerging capabilities are those related to Traditional Chinese Medicine (TCM), Culinary Science, Food & Nutrition, Water & Environment, Plant & Aquaculture as well as Nanotechnology/ Materials Science.

I am impressed by the School's R&D work in the area of TCM. I also appreciate their knowledge and facilitation in our IVS application process. We are looking forward to tapping on their TCM R&D expertise under the IVS scheme.

Dr Harry Zhang
Chief Consultant,
Herb and Fashion Pte Ltd.

More information on IVS can be found in the SPRING SINGAPORE website: <http://www.spring.gov.sg/EnterpriseIndustry/IV/Pages/innovation-voucher-scheme.aspx>
For information on the technical support that our School of Applied Science can provide, please visit our website: http://www-as.tp.edu.sg/asc_home/asc_industry.htm

Centre for Traditional Medicine

Dr Ong Seng Poon
 Deputy Director / Capability Development
 Manager / Research & Development

Temasek Polytechnic's School of Applied Science (ASc) launched the Centre for Traditional Medicine in April 2010. The Centre provides an integrated approach to present ASc's comprehensive capabilities in Traditional Medicine (TM) to the industry. With the growing interest in this alternative medical system, the Centre will serve as a one-stop centre offering services ranging from consultancy to training, education and research activities. More specifically, the Centre will assist in the modernisation of the TM industry as it hopes to preserve the relevance of TM for the younger generation, focusing on the quality, safety and efficacy of TM. It also hopes to play a pivotal role in providing support to government agencies and regulating authorities in TM-related matters.

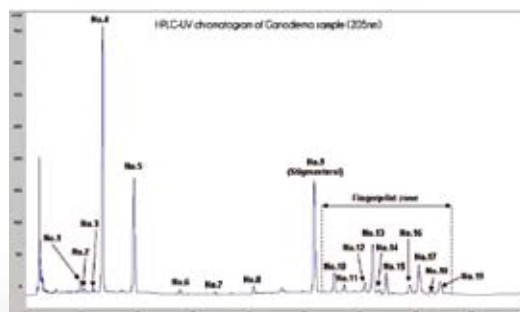
Centre for Traditional
 Medicine

Contact Details:
 T. 6780 6423 (Dr Ong Seng Poon)
 6780 6220 (Dr Cui Taian)
 6780 5078 (Ms Lee Yian Hoon)
 E. ctm@tp.edu.sg

Research & Development



Feature



One of the key roles of the Centre is in R&D, and it has developed partnerships with key industry players, professional organisations, hospitals, government authorities and Institutes of Higher Learning to conduct joint applied research in TM-related areas such as:

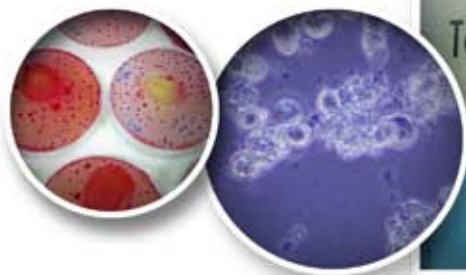
- Active/toxic components screening/monitoring by mass spectrometry
- Efficacy Studies
- Pharmacokinetic Studies
- Identification of Specific Peptides in Raw Herbs
- Protein Expression Studies Through Cell Based Assays
- Analysis of TM Products Using Proteomics



Consultancy services

With a view to enhancing the manufacturing process of TM products, our multi-disciplinary team of chemists, biologists, microbiologist, pharmacists, food scientist/technologist, nutritionist, veterinarians and process engineers have provided consultancy on:

- TM Profiling and Authentication
- Chemical and Microbial Testing
- Efficacy Studies using animal models and human subjects
- Development of Functional Food Products
- Good Manufacturing Practices (GMP)



Feature

Education Programmes

A new series of Executive Courses in Chinese Medicinal Materials was rolled out in September 2010. These courses, conducted in English are intended to help participants acquire a scientific perspective of TCM. The courses also provide healthcare professionals with additional knowledge such as understanding the effectiveness and precautions for the concurrent consumption of western and TCM medications.



Executive Courses in Chinese Medicinal Materials

- Executive Certificate in Understanding Traditional Chinese Medicine
- Executive Certificate in Understanding Chinese Medicinal Herbs
- Executive Certificate in Authentication and Processing of Medicinal Herbs
- Executive Certificate in Application of Chinese Medicine in Health Cultivation
- Executive Certificate in Application of Commonly-Used Chinese Medicine in Disease Management

Collaboration in TCM Research

Health Sciences Authority (HSA) & TP

Feature

Dr Quek Hung Hiang

Course Manager, Diploma in Biotechnology

In line with the Centre's objective of supporting government agencies in matters related to TM, it is currently working on a joint collaborative project with HSA to develop a method to detect fraudulent ingredients in TCM that might compromise its efficacy.

The research team will attempt to identify signature protein fragments and to use these to ascertain the presence or absence of the key animal ingredient. The project will leverage on the strengths of both organisations - HSA's Traditional Chinese Medicine regulatory expertise and ASc's proteomics (*total protein analysis*) capabilities. This project which is funded by the Ministry of Education's Innovation Funding, is a testimony of the project's scientific merit and applied value.

For more information on the **Centre for Traditional Medicine**, please visit **Centre of Excellence** in our School's website: http://www-as.tp.edu.sg/asc_home/asc_aboutus/asc_aboutus_ce/asc_aboutus_ce_ctm_web.htm

Adult Training

Staying connected, working together with industry, understanding their needs, sharing knowledge by way of adult training is what our industry partners have come to know us for. We have helped equip many adults with new or better skills through our part-time courses such as in culinary science, acupuncture and environmental and water technology. Here we highlight just three of our training courses and programmes.

Specialist Diploma in Biopharmaceutical Technology (SDBT)

Many trainees in the pioneer batch of the one-year SDBT programme were offered jobs even before they had completed the course.

Industry Connected!



Sobha Narayanan's success story is a reminder that training should not take a backseat even during good times. When Sobha decided to 'go back to school', her colleagues were shocked by her decision to leave the security of her job which she enjoyed and was doing very well in. This was at a time when many were still unemployed, having lost their jobs in the most severe economic crisis that Singapore and the world had experienced in many decades.

Sobha had been following the industry trends and was confident that the skills and knowledge she was going to acquire would be relevant and useful with six new biopharmaceutical manufacturing plants expected to be operational by 2014. Even as she held high hopes for this new career path, she had "moments of worries about the uncertainty of getting a job at

my age. It was also a strain juggling studies, work and looking after the needs of my young children."

However, before the completion of the SDBT programme, Sobha was offered a permanent job in the company where she was an intern. She attributes her success to the theoretical knowledge and practical skills acquired through the intensive training programme which equips students with specialised knowledge and hands-on skills in areas of cell culture, aseptic techniques, bioreactor operations, downstream processing and basic cGMP. The best part of the programme, as Sobha found, is the opportunity provided by the 20-week internship with major companies in the industry, opening up opportunities for embarking on a career in the biopharmaceutical manufacturing and supporting industries.

As TP's first Professional Conversion Programme, the SDBT was jointly launched in September 2009 by ASc and TP's Professional Development Centre, with funding support from the Ministry of Education and the Singapore Workforce Department Agency. The course aims to enhance the

job opportunities for Professionals, Managers, Executives and Technicians (PMETs) with at least a diploma or degree in Science or Engineering by helping to re-profile them into the local biopharmaceutical industry where there is a shortage of skilled workers.

Professional Development Centre(PDC)

Contact Details:
T. 6788 1212
F. 6788 1475
E. pdc@tp.edu.sg



Pet Care & Management Training

Dr Diana Chan

*Assistant Director / Technology Development
Course Manager, Diploma in Veterinary Technology*

Since 2005, TP has been the only polytechnic that provides training in responsible care and use of laboratory animals for biomedical research scientists and technical support officers from government agency, hospitals and research institutes.

In November 2009, the Agri-food and Veterinary Authority of Singapore appointed TP as the training provider for a certified three day course in pet care and management (companion

animals) for new and existing pet shop licensees and their management staff. At least 200 pet shop licensees and their staff have successfully completed the mandatory course as part of the pet shop licensing requirement. The course, which covers topics ranging from animal care and diseases, responsible pet ownership, client education and business management, is currently offered in English and Mandarin. Plans are in the works for similar courses on the caring and management of birds and fishes.

Temasek Polytechnic
School of Applied Science

Contact Details:
T. 6780 5118
E. cadytay@tp.edu.sg

Customised Nutrition Workshop

Ong Eng Gim

Lecturer, Diploma in Applied Food Science & Nutrition

With the coordination of TP's Professional Development Centre, workshops were conducted April-May 2010 to equip Sentosa Resort & Spa staff with basic nutrition knowledge. Selected chefs also underwent the Advanced Nutrition Workshop to learn the principles of therapeutic meal preparation to cater to their clients who have special dietary requirements such as purine, cholesterol or calorie-restrictions.

Chefs learned the 'know-how' in preparing healthier meals. As they apply this knowledge to modify their signature dishes or create innovative new ones, guests can expect more variety in the menu. This will also help dispel the myth that 'healthier foods are tasteless or unappetizing'.

ASc plans to continue offering customised workshops and similar courses to support HPB in promoting their Healthier Dining Programme with various hotels and resorts.

Professional
Development
Centre(PDC)

Contact Details:
T. 6788 1212
F. 6788 1475
E. pdc@tp.edu.sg



I am very pleased with the workshops and outcome. The content was perfectly tailored to our needs. The delivery was very professional. Thank you very much for your amazing efforts. And I do look forward to further projects with you.

Executive Chef Michael Liebl
Sentosa Resort & Spa

Pedagogical Practice

At the heart of excellence is passion. This is what drives our award-winning teaching staff to make learning come alive for our students. It is also what pushes our students to make the best of their learning experiences which include working on real industry projects as their Major Projects and Student Internship Projects (local and overseas); getting hands-on training in the Student Exchange Programme and in ASc's latest campus Learning Enterprise.

Teachers Par Excellence

It is certainly true that excellent teachers have that 'X' factor, looking at Kalpana Bhaskaran and Ong Eng Gim, with their passion for teaching delivered in their own inimitable teaching style.

While Kalpana's trademark sense of humour is used creatively to facilitate active engagement of students that challenge their thinking, Eng Gim's holistic approach to education is to zealously seek out opportunities for students to be involved in community projects that require application of their diploma-specific knowledge and skills such as nutrition workshops for children and low income families.

When TP launched its **Teaching Excellence Award (TEA)** at the Learning Academy's LA Fest 2009, Kalpana was among the first five to receive the inaugural award while Eng Gim was a TEA 2010 award recipient. The TEA recognises, as did our School's students, staff and management, that Kalpana and Eng Gim have demonstrated significant impact on student learning through their teaching practices, and stand out as being exemplary in enhancing students' learning experience and development, serving as role models for colleagues in our polytechnic.



When our School invited **Ms Dewi Hartaty Suratty, Head of Halal Certification Strategic Unit of the Islamic Religious Council of Singapore (MUIS) in 2009,** to give a talk on halal awareness, we did not expect the overwhelming response of students and staff

The Halal Focused Workshop further whetted appetites of participants who asked for more in-depth programmes pertaining to halal education. That hunger for more reflected the general awareness of the burgeoning halal food market and its social importance. Apart from talks by MUIS,

our School has since introduced problem-based learning approaches in handling halal-related issues for students going into the F&B industry. Topics on halal issues have been incorporated into selected food and pharmaceutical subjects for full-time students in some diploma courses.

HALAL Awareness

Dr Nurmawati Bte Muhammad Hanafiah
Lecturer | Chemistry Section

Students' Joyful Projects

- *Renal Guidebooks for Asians*
- *Educational Videos on Healthy Eating*

Kalpana Bhasakaran

Supervisor for the projects on *Development of Renal Guidebooks for Asians and Development of Educational Videos on Healthy Eating*

To help Asian patients manage their kidney disease through diet, our students Yu Shaomei, Ler Yi Bin and Giam Yan Xin from the Diploma in Applied Food Science & Nutrition (FSN), formulated, tested and modified suitable recipes in consultation with the sponsoring hospital. They also conducted small-scale sensory evaluation of the dishes for user-readiness of the recipes.

This project, which clinched our School's prestigious project prize in early 2010, was a collaborative project with Khoo Teck

Puat Hospital (Nutrition & Dietetics Department) which saw the need for the development of a comprehensive nutrition guide for the growing number of renal patients. Although this area of renal medical nutrition therapy was completely new to them, our three adventurous FSN students took the bull by the horns and not only developed a useful set of guidebooks for pre-dialysis patients and those undergoing haemodialysis and peritoneal dialysis, they also designed creative educational tools such as Renal Dietary Wheels.



It was exhausting, working on this project for more than half a year. But the thing that drove me on was thinking about how it would benefit the patients. It was so good to see their delighted faces as they went through the booklets.

Yu Shao Mei

Gold Medalist 2010 (FSN), Dietetic Technologist, AMK Community Hospital

One Dish Meal

1. Chicky Veggie Patty
2. Ginger & Wine Baked Fish
3. Zesty Mango Curry

Vegetarian Delights

4. Four Treasures Curry
5. Lentil Potato Pie
6. Ratatouille

Sweet Treats

7. Apple Oats Muffin
8. Crumbly Fruit Pie
9. "Foo Chuk" with Barley in Soybean Milk

Supery Soups

10. Asian Assam Pedas Soup
11. Halloween Orange Flesh soup
12. Herbal Melony Soup

Disc 1

Disc 2

The Joy of Healthy Eating

The Joy of Healthy Eating

4 themes & 12 easy-to-cook healthy recipes with nutrition tips

A joint project by:

Another collaboration with Khoo Teck Puat Hospital was the project on developing educational videos by our students Jasmine Tan, Tan Si Hua, Tan Kian Chang. These popular videos are currently sold at Health Information Centre (HIC), Health Promotion Board (HPB).

One More *Campus Learning Enterprise*

Petrina Lim

Course Manager, Diploma in Baking & Culinary Science



Students and staff in TP were delighted when **Deli Delite** opened in June 2010. A 'hot' favourite at this food kiosk is the *teppanyaki* ice cream made by **KoolWerkz**, ASc's first and award-winning learning enterprise.

This latest learning enterprise, initiated by TP's PCEO Mr Boo Kheng Hua, conceptualized by the Diploma in Baking & Culinary Science (BCS) course team, was also to develop and evaluate the feasibility of a takeaway food kiosk business concept for future franchising.

Like the **Bistro Walk Café**, ASc's other learning enterprise, Deli Delite has a real-life commercial F&B retail setting. Foodservice staff apply what they learnt in their courses and get first-hand experience in its business management and operations. ASc graduates manage the daily operations independently and also train the students.



Student eXchange Programme

Our classmates helped us, the non-Chinese, cross the language and cultural barriers by being our translators. It was great making many new friends. Some of us are seriously considering working in China!

Aini Bte Kassim
Year 3 BCS Student

The Memorandum of Understanding between Temasek Polytechnic and the **Sichuan Higher Institute of Cuisine (SHIC)** sparked off learning opportunities for our students from the Diploma in Baking & Culinary Science (BCS).

In June 2010, BCS students were thrilled to expand their culinary repertoire in traditional and innovative Sichuan dishes, while learning the science behind their preparation. Then in October, SHIC students and their chef, hosted by TP, learned about the application of science in the preparation of local popular dishes that are uniquely Singaporean, and also Western cuisines.

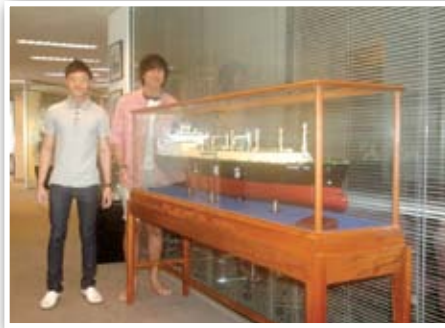
Over the next few years, more student exchange will not only enhance learning opportunities on both sides, but also lay the foundation for strong networking and future career prospects.

Overseas Student Internship Programme (OSIP)

A highlight of our students' poly education is the OSIP. The students' effusive enthusiasm for the OSIP deep learning experience is reflected in some of their quotes here.

A rare opportunity to step out and experience independent living. It was certainly a life changing and educational experience!

Amy Josephine Ng Wei Ling
Diploma in Veterinary Technology



Chemical Engineering Project: Vapour Recovery System of Volatile Organic Compounds (VOCs) in Vessels Transporting Oil and Chemicals.

North West Shelf Shipping Service Company, Australia



Veterinary Technology Project: Incidence and Efficacy of Moxidence Against Gastrointestinal Parasites of Horses in Northern Melbourne.

Macedon Ranges Equine Vets, Australia

Biomedical Science Project: Fabrication of Scaffold for Controlled Drug Release.

Athlone Institute of Technology, Ireland



Chemical Engineering Project: A Study on Electromagnetic Properties of Multi-Walled/ Cobalt-Iron-Oxide (Iron Oxide) Composites

Shanghai Jiao Tong University, China



Biomedical Science Project:

Purification & Characterisation of a Mesophilic Alpha-Amylase Enzyme from Bacillus Amyloliquefaciens.

Jiangnan University, China

Definitely an eye-opening experience! So much to learn about the work and environmental safety and the mechanical and engineering aspects on board this sort of cargo ship.

Jonas Png and Yeo Zhi Yuan
Diploma in Chemical Engineering



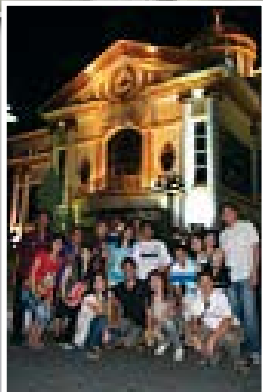
Biotechnology Project: Molecular Characterisation of MicroRNA 172 Involving Storage Root Development in Cassava.

National Center for Genetic Engineering and Biotechnology, Thailand

Applied Food Science & Nutrition Project:

Develop an Overseas Export Market for US Wheat and Provide Assistance to Buyers.

US Wheat Associates, Thailand



Education Alive!



Accredited Glycemic Index Research Unit a First in Asia-Pacific Region

Until the mid-1990s, the only application of GI was in the treatment of diabetes. Many studies around the world subsequently showed how the GI concept could be relevant to the normal population. In the Asia Pacific region, the concept is still in its infancy and there are a lot of challenges in using GI as a tool for health promotion.

In response to this, Temasek Polytechnic set up the Glycemic Index Research Unit, a first in Singapore and the Asia Pacific region. This unit is well-equipped to conduct GI testing of foods and meals. It also works with a multi-disciplinary team under TP's School of Applied Science and taps into their expertise in food science, baking & culinary science, biomedical science, analytical

chemistry, and veterinary science studies.

Our GI Research Unit has received the accreditation for testing from the Singapore Accreditation Council (SAC).

We have also signed an MOU with the Health Promotion Board to set up the GI index database of local foods. By

2011 our GI Research Unit would have tested at least 20 types of foods for their GI value.

The food industry is starting to recognize the importance of developing products that will help manage disease conditions. Consumers will soon find GI labelling on food items to be commonplace.



Glycemic Index at the crossroads

Implications for the Food & Healthcare Industries

TP announced the GI Research Unit's accreditation on November 20, 2010 at the symposium which was graced by 160 health professionals, representatives from the food industry, governmental and non-governmental organizations, Institutes of Higher Learning and local universities.

Mr Lam Pin Woon, then Chief Executive Officer of Health Promotion Board was the Guest of Honour. Mr Lam mentioned that this symposium was timely in view of the increasing obesity rate, as there is a need for more awareness among the population.

Our key-note speaker was none other than Prof (Dr) Thomas Wolever, who co-founded the Glycemic Index concept. He captivated the audience with his simple explanation of the Glycemic Index concept and its relevance to health.



This symposium offered an intellectual and sensory treat to all those who attended.

The low GI snacks and creative lunch menu of low GI foods prepared by the School's Baking & Culinary Science students received the most applause!

Dr Allan Lim

Nestle R&D Center Pte Ltd

Dr Allan Lim, Group Manager, Food Science & Innovation Partnerships, Nestle R&D Center Pte Ltd Singapore, spoke about the challenges in producing palatable, nutritious low GI food products.

Dr Eric Khoo, Consultant Endocrinologist, National University Health System (NUHS) Singapore, presented on the importance of low GI foods in the management of diabetes mellitus.

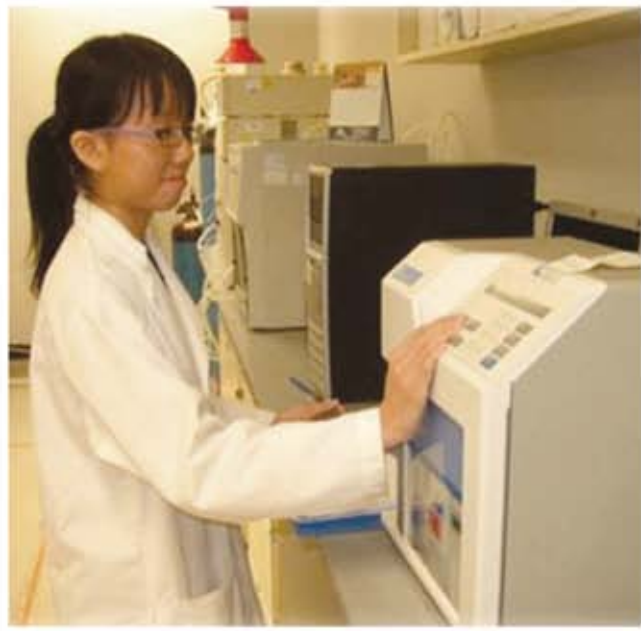
Ms Chin Poh Yin, Head Laboratory, GLP, SAC, SPRING Singapore spoke about the accreditation process.

Educating the Public

Knowing the GI of food and how to apply it in optimizing a healthy diet has many health benefits, especially for obese or overweight people, diabetics and athletes. Without this knowledge, consumers are unable to optimize their diets and lifestyles.

Our GI Research Unit is all set to test the GI of local staples like rice, noodles and bread. We also conduct regular workshops to educate the public on the GI concept and planning meals with low GI foods.

To educate the younger generation on how to plan meals with low GI ingredients, Temasek Polytechnic in collaboration with Student Health Centre, Health Promotion Board is currently involved in producing a cook book, *Youth CAN COOK! with Low GI Ingredients*. This cookbook is accompanied by a demonstration video.



FAST FACTS on Glycemic Index

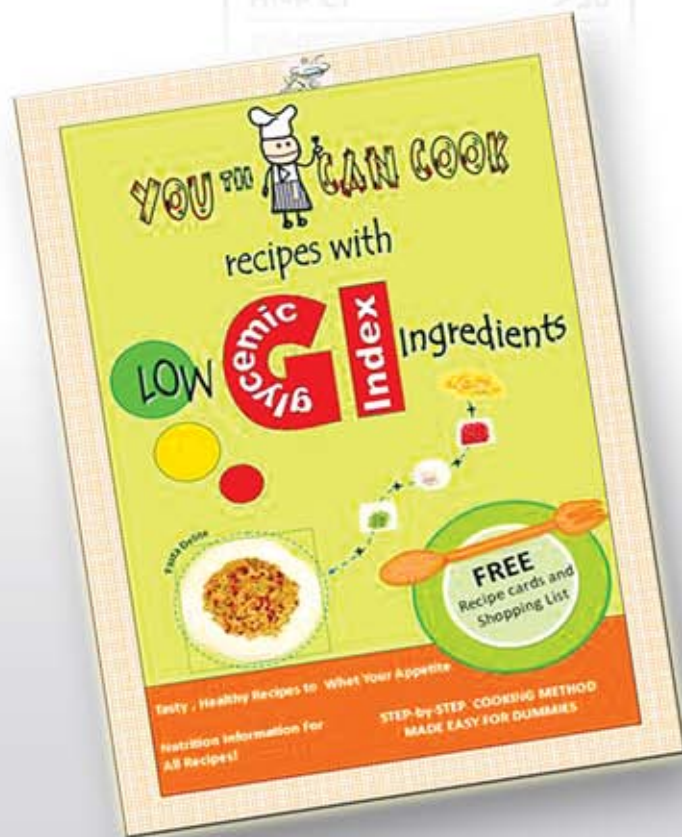
- Glycemic Index (GI) is a Measure of Carbohydrate Quality*
- Low Glycemic Foods Metabolise Slowly**

*ie. it is a system of ranking carbohydrates based on the rate it raises blood sugar levels.

** hence they release glucose gradually into the blood stream.

CLASSIFICATION

Low GI	≤ 55
Medium GI	56 - 69
High GI	≥ 70



It has been a **slow** and **steady** journey towards the creation and testing of *low GI foods*.

Glycemic Index Journey



Glycemic Index Research Unit
Temasek Polytechnic
School of Applied Science

Contact Details :
T. 6780 5355
E. bkalpana@tp.edu.sg

Cover Story



TP's collaboration with HPB makes TP the premier institution in Singapore with respect to GI, and will provide large scope for novel research for a number of years to come. It is wonderful to see what you are doing with the GI concept and I am looking forward to accompanying you on the "journey"!

Prof (Dr) Thomas Wolever

*Dept of Nutritional Science & Medicine, University of Toronto
Staff member, Division of Endocrinology and Metabolism, St Michael's Hospital, Toronto
President, Glycemic Index Laboratories, Inc.,
TP's Distinguished Advisor*

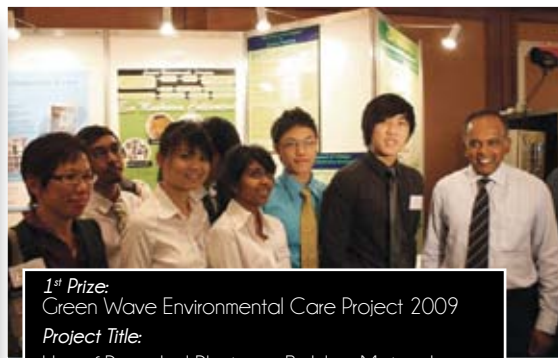
Awards & Accomplishments

True winners know that competitions are really meant to test one's mettle, not merely one's mastery of skills and knowledge or even one's talent, creativity and innovation. While that may be an important lesson in life, nevertheless, it is always gratifying for our students to have their endeavours recognised as the best or among the best in Singapore or abroad.

Education Alive!



Merit Award:
Tan Kah Kee Young Inventors Award 2010
Project Title:
AquaSol System Self-Watering Device for Plants



1st Prize:
Green Wave Environmental Care Project 2009
Project Title:
Use of Recycled Plastics in Building Materials



3rd Prize:
Singapore Junior Water Prize Competition 2010
Project Title:
Biosorption and Recovery of Crude Oil Using Immobilised Chitosan



2nd Prize:
SALAS Star Innovator in Laboratory Animal Science Award 2009
Project Title:
A Study on the Use of a Novel Biosensor in Monitoring Micro-environmental Parameters for Laboratory Rodent Cages

Gold Award:
Food and Hotel Asia (FHA) 2010 Culinary Challenge
Project Title:
Ethnic Asian Meal Plated Food Display



Champion | 2nd Runner Up | Best Hygiene Award:
NESTLE Professional Rising Chefs Challenge 2010
Project Title:
Restaurant Platter for Five with NESTLÉ Products



Best Creativity Award:
Crystal Growing Challenge 2010
Project Title:
Growing A Crystal Garden Using Porous Substances & Salt Compounds



Silver Award



1st Runner-up:
Penang Culinary Challenge 2010



Honorary Award:
Singapore Chemical Science Fair 2010
Project Title:
The Preparation Modification & Characterisation of Au Nano-Wire & Its Catalytic Application For Fuel Cells

FHA 2010 Culinary Challenge

Petrina Lim

Course Manager, Diploma in Baking & Culinary Science



The foray in April 2010 by fresh graduates of the Diploma in Baking & Culinary Science (BCS) into its first international competition proved to be an astounding success. Edmund Lim Kai Wai and Corinne Chung Ke Wen won a Gold and Silver Award respectively at the Food and Hotel Asia (FHA) 2010 Culinary Challenge (FCC), known as Asia's most established culinary competition.

They did our polytechnic proud positioning themselves among 72 teams from international hotels and culinary schools from Singapore, Philippines, Korea, Malaysia, China, Hong Kong, Taiwan and Indonesia.

It was truly a culinary challenge as Edmund and Corinne, having just completed their diploma course, had to pit their skills against apprentice chefs as well as master chefs.

NESTLÉ Professional Rising Chefs Challenge 2010



'Secret Chefs' Ethan Goh and Andy Tan were the champions at this national competition, competing against other poly students and even chefs from the Shangri-la Hotel, St Regis Hotel and the Resorts World Singapore. Both, students from the Diploma in Baking & Culinary Science (BCS), won the judges over with their impressive presentations, rated highly in areas such as nutritional quality, flavour and texture development in the food preparation. Their award includes an all-expenses paid two-week professional internship with Nestle Professional China, and up close and personal experiences as understudy to the chefs at two top restaurants in Beijing, China.

the GREEN

grip

The 'Hands' sculpture created by participants of the ECO Camp, shows two hands holding up a tree.

The tree is a symbol of life, giving us food and being a home for many microorganisms, representative of the fragile ecosystem in our hands.

The sculpture is also a symbol of unity in preserving and conserving **Biodiversity** as a team: *it takes 2 hands to clap!*

Shee Jing Rui
GIG President

Diploma in Chemical Engineering, Year 2



Caring for our fragile planet is a way of life at ASc.

Our students from the Diploma in Chemical Engineering, who form the majority in TP's Green Interest Group (GIG), cheerfully helped to organise

ECO CAMP 2010 with participants from various tertiary institutions. And every year, they participate earnestly in national competitions on environmental protection such as Green Wave Environmental Care Project and the Singapore Junior Water Prize.





Our Environmental & Water Technology-related projects:

- ✓ **REUSE** of waste materials (eg plastics, wood chips) as Building Materials
- ✓ **RECYCLING** and processing of wood waste to manufacture Bioethanol
- ✓ **RECOVERY** of cellulase (used in the digestion of wood waste) through nanotechnology
- ✓ **REDUCTION** of water pollution using Fe-based coagulant
- ✓ **REMEDICATION** of the environment by treatment of oil spills



Our teaching staff organise exposure programmes for students on '**green**' raw materials. An industry guest from **Pacific Oleochemicals** was invited to give an enrichment lecture to students and a study trip was arranged for students to visit palm oil mills in Malaysia.

Giving back to the community while passing on the message of environmental sustainability is something our students do with zest. They readily spent their free time on the **Lighting Up Your Lives** project, led by the GIG and ASc Studies Club, which benefited more than 350 low-

income households with the replacement of conventional light bulbs with energy saving ones.

A favourite '**green**' initiative which our school is well known for is the making of soap from used cooking oil. Workshops have been conducted in our laboratories for secondary school students. Cambodians, like the '**Daughters**' (*girls and women rescued from illegal drug and human trafficking*), have also been taught this useful skill as part of our school's **Overseas Cambodian Projects**.





Before/After pictures showing adsorption of crude oil by chitosan-coated carriers

Crab Shells to Clear Oil Spills?

The judges felt that the project was creative, and the students were very passionate about their work.

Mrs Grace Quah
Competition Organising Committee Chairperson,
Source: The New Paper (June 14, 2010)

This idea of using crab shells may not be so far fetched. Though it may take a while longer to materialise than the two years spent on this project by the team from the Diploma in Chemical Engineering

Judges at the **2010 Singapore Junior Water Prize Competition** liked the idea and awarded the team the third prize (*two other teams having tied for the top prize*). They were also impressed by the teams' research in this relatively new area and by their resourcefulness in taking advantage of the available materials in the ASc laboratories.

The oil adsorbent, **chitosan**, is derived from chitin (a *biopolymer extracted from crustacean shells*) through a deacetylation process. The team had immobilized the chitosan on buoyant carriers and saw how this amazing oil adsorbent adsorbs its own weight of crude oil in a matter of seconds.

They had also built a two-tier **Desorption/Recovery unit** which uses strong turbulence over a 24 hour period to recover the adsorbed oil.

This would mean that crude oil cleanup can be done rapidly. The other advantages are its low cost, environmental-friendliness, suitability for large affected areas and rapid deployment. But the ultimate advantage is the recoverability of the adsorbed crude oil for future use, making this technique a viable and attractive method for oil spill management.

Dion Khoo
Lecturer, Diploma in Chemical Engineering
Supervisor for the project *Biosorption & Recovery of Crude Oil Using Immobilized Chitosan*

Recycling Waste Plastics into Building Materials

Dr Wong Sook Fun
Lecturer, Diploma in Chemical Engineering

Currently only nine percent of all plastics are recycled. We hope that this recycling technology would one day be established enough to be used in the market to help reduce Singapore's reliance on imported sand.

Jonas Png
Diploma in Chemical Engineering
Year 3

Turning recycled waste plastics into building materials makes learning come alive for our students. Inspired by the challenge of testing this innovative idea, a first for our tropical region, with its many potential applications for industry such as green buildings, infrastructure and protective structures, our students conducted highly intensive trial tests and were duly rewarded with the top prize in the Green Wave Environmental Care Project 2009.

At this prestigious national competition, where they competed against participants from universities and other polytechnics, our students were awarded with a grand prize of \$10,000 and a one-month attachment to a Shell affiliate company in Australia.

The augmented material can be used for paving bicycle or pedestrian paths. Concrete augmented with recycled plastics is lighter and 20 percent cheaper. Further experiments and tests would have to be conducted before bringing the technology into the market.



Our Materials & Nanotechnology Research Team successfully secured the Ministry of Education's Innovation Grant of over \$500,000 (April 2010 to March 2013) for our proposal to study how we can potentially recycle the mixed plastics in Singapore.

Mixed plastics (various polymer types) are typically found in the domestic and industrial waste streams in Singapore. Currently, only sorted plastics are recycled and these are mostly exported.

This study aims to develop a technology to use mixed plastics in high-performance composites and nanocomposites. These composites will be used in diverse applications which include green buildings, infrastructure and protective structures. The successful implementation of the project will promote sustainable development and use of nanotechnology while bringing costs down in the production of building components for different applications.

MOE Grant to Study Mixed Plastics Recycling

Contributing to Community - Serving Locally & Globally

People who have benefited from our students' good works can recognise that as an educational establishment, we are keen to school our students for excellence by educating them in the 'head, heart and hand'. And they can see that our students' youthful zeal in serving is the *leitmotif* that runs through our community service projects at home and abroad.



The WhyOhGee was definitely the most 'happening thing' in my life! The athletes were friendly and interested in our local culture. Those cultural exchange experiences were truly memorable!

Song Yu Xuan
Nutrition Ambassador, Yr 3 FSN

Nutrition Ambassadors

As students of nutrition science, 16 students from the Diploma in Applied Food Science & Nutrition (FSN), experienced first hand the integration of the theories learnt in their course when they put them into practice at the inaugural YOCG.

As Nutrition Ambassadors, they provided the athletes with basic information on sport nutrition queries, tips on hydration and post-event refueling and advice for those with special dietary requirements, all under the watchful eyes of the Sports Council's sports nutritionists.

To interact with the athletes, coaches and team officials from 204 countries for 12 days was awesome. I was inspired by the youth athletes who showed such commitment to their sports.

Agnes Tan Hui Ting
Nutrition Ambassador, Yr 3 FSN

YOG Volunteers

More than 300 ASc students from all the diploma courses helped out at Singapore's inaugural **Youth Olympic Games 2010**, in various roles such as Doping Control Chaperones, Chef and F&B Service Assistants, Nutrition Ambassadors and Horse Handlers & Stewards.

The training was rather demanding and we had to make a lot of sacrifices. The assigned tasks were also tough. But it was a great chance in my life to do this while I'm in my chosen course in TP!

Lynette Lim
Year 3 VeT



Horse Handlers & Stewards

To be accredited as Horse Handlers and National Technical Officials (Stewards) for the Equestrian event, the 60 students selected from the Diploma in Veterinary Technology (VeT) attended regular theory and practical classes which started in May 2010. They worked hard to pass the assessments conducted by the SYOGC.

Their duties were many and required careful attention, some of which included putting on socks for the horses, checking that the halters and saddleries were fitted securely and assisting the veterinary surgeons in examining the horses before and after competitions.

I thoroughly enjoyed my stint! My tasks included walking and trotting the horses around before the competition and helping the youth Olympians to mount and dismount from the horse

Daryl Tan
Year 3 VeT

Cooking at the Singapore Buddhist Lodge

The way to a community's heart is easy when you know how to cook. Even when it's a mammoth task of cooking for more than 1000 people. Forty-seven staff and students from the Diploma in Baking & Culinary Science (BCS) gamely rolled up their sleeves for a whole day in the kitchen to prepare vegetarian dishes for hungry devotees, the poor, the migrant workers and visitors. Like many other volunteers before them, our BCS staff and students felt privileged to be part of this Buddhist tradition of kindness and generosity in serving free meals daily to all who turn up at the lodge.

As our BCS team members were all of different ethnicity, faiths and cultures, this was one service project that also served to draw our Singapore community even closer together.



APEC Voices of Youth (VOF)

Youth volunteers "lend their voices" by assuming the role of youth journalists, providing fresh perspectives on APEC by reporting on the happenings using popular social media such as Twitter, Facebook and blogs. Shermaine Eng was selected by the National Youth Council, as one of 40 Singapore Youth Delegates for that alternative voice in APEC 2009.



The coming together of youths from different nations, with their different cultures and outlook on life, was a wonderful opportunity for sharing and learning. The rare chance to interview political and business leaders and observe the APEC meetings, was such an enriching experience. VOF is a great platform for youths to hear and be heard and I hope that more will be able to attend such events for the invaluable learning experiences.

Shermaine Eng
Diploma in Veterinary Technology, Year 2



Overseas Community Projects (OCP)

Our students' diploma-specific knowledge and skills have been put to good use in service projects since 2006, in collaboration with Girls' Brigade in Singapore and their partners in Cambodia.

Something new for the Cambodians in 2010 was the contribution by students from the **Diploma in Veterinary Technology** who did a Needs Analysis Survey on areas such as basic hygiene, animal health and diseases, animal housing and farm management. **Cambodia Global Action** representatives gladly received the

students' presentation of the survey results and engaged them in a lively discussion on ways to improve the lives of the villagers. With the help of an interpreter, the students also gave educational talks to the villagers on topics relating to animal health diseases and hygiene.

Despite hectic schedules, the **Biomedical Science** and **Pharmaceutical Science** students found little windows to chat with workshop participants. They came away with a deeper commitment to serve, having had a glimpse of these Cambodians' hopes and aspirations for their community.



Trudging from house to house to interview villagers was energy-sapping. But their warmth, especially the curious children, quickly restored the spring in our step. I feel that serving the community should be lifelong and we should serve when given the chance. My own inspiration comes from Tom Head. "Each of us has the power to give life meaning, to make our time, our bodies and our words into instruments of love and hope."

Jamie Chan,

Diploma in Veterinary Technology, Year 3



I work in Kampong Chhang Mondays to Fridays and travel 90km home on weekends. I train the villagers on agriculture, health and hygiene matters. The workshops on Women's Health, HIV/AIDS, Wound Dressing, Handwashing are really useful.

Sin Sinan,

Cambodia Global Action Staff, Agriculture Degree Holder



I'm a grandmother and I've been a trainer in my own village for 10 years. My team is involved in projects like digging new holes for wells, repairing electrical appliances, raising new breeds of chickens and selling things in small shops. I want to create a better environment for the villagers so that our community can continue to grow and our living conditions can improve.

Tep-Keathanith,

Kampong Speu Community Leader



OVERSEAS COMMUNITY PROJECTS 2010

Nutrition Education Workshop
(Diplomas in Applied Food Science & Nutrition/
Consumer Science & Technology)

Training in Managing Cafeteria
(Diploma in Baking & Culinary Science)

Health Education Workshop
(Diplomas in Biomedical Science/
Pharmaceutical Science)

Soap-making Workshops
(Diploma in Chemical Engineering)

**Management, Husbandry and Care
of Backyard Chicken**
(Diploma in Veterinary Technology)

Graduation is a time to fly away but over the years more of our ASc graduates have been returning to be part of the team that nurtures students and supports the school's work.

The first ever **Alumni Nite** held in December 2010, was also a homecoming. Tan Keng Beng, Chief Adviser of the ASc Studies Club, hopes that this platform for reunion opportunity for all its former committee members would become an annual event for both alumni and students to expand their social portal and networking. It was no mean feat to track down members (2002 to 2009), but the tenacious organising committee, led by student Edmund Tan, managed to "*Bring Them Home*", all the past presidents and most of their committees.



a Home COMING

TP was like a second home to me, so I enjoyed returning after graduation to help out in student projects especially during Freshmen Orientation. And naturally, I grabbed the opportunity to work as ASc staff at KoolWerkz. Now I'm also an official mentor to the students! My hope is for the strong ASc spirit to continue so that students will have a great sense of belonging to one big family, caring for each other while serving others outside this close-knit circle.

Grace Chan, ASc Technical Support Officer
 ASc Studies Club President (2005/06)
 and Adviser (since 2009)



ASc Alumni
 Contact Details:
 Grace Chan
 E. chan.jl@gmail.com

Our student days in TP were the best years of our student life. We appreciate the many opportunities for personal development, academically and socially, as well as leadership qualities. We would be happy to share with the students about our ASc experience and also our further education and industry experiences.



Agnes Tan,
 ASc Studies Club's first President (2002-2004)

Lester Lim, ASc Project Officer
 ASc Studies Club's Ex-co (2002/03), President of Experiential Learning Facilitator Interest Group (2003/04)



I was in the pioneer batch of students from the Diploma in Consumer Science & Technology. Remembering how well I was nurtured as a student here and returning to teach in my alma mater is not just about giving back. It's a privilege.

Nur Azlina, ASc lecturer,
 Diploma in Consumer Science
 & Technology



Feature