

AScientia

PASSION TO MAKE IT HAPPEN!

At KOOLWERKZ

The AScientia Team

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THE EDITORS WOULD LIKE TO EXTEND THEIR APPRECIATION TO ALL WHO HAVE CONTRIBUTED TO THE WRITING OF THIS ISSUE.

AScientia

PASSION TO MAKE IT HAPPEN!

A combination of the word 'ASc' (the acronym for Temasek Applied Science School) and the Latin word 'scientia' (which means knowledge, science or skill).

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Training at KOOLWERKZ

KoolWerkz, our Training Factory is the innovative brainchild of ASc, the School of Business (BUS) and the TP Entrepreneurship Centre (EC). Here, learning goes beyond the classroom or laboratory into a real world setting for TP students.

KoolWerkz, ASc's frozen dessert training factory, is the innovative brainchild of ASc, the School of Business and the TP Entrepreneurship Centre. Here, learning goes beyond the classroom or laboratory into a real world setting for TP students.

FAST FACTS

- Less than 3% fat
- Available in 3 flavours
- No Sugar Added
- Served to President SR Nathan in 2002

Set up in one of Singapore's food manufacturing zones, this ice cream manufacturing plant aims to provide hands-on training for entrepreneurship development. The factory serves as a training centre to create an entrepreneurial mindset amongst students and graduates. In this real-life environment, students' minds will be stretched to undertake responsibilities that they would never have otherwise had in a laboratory or classroom setting.

Equipped with the complete outfit of an ice cream making plant, KoolWerkz caters to the whole works of the manufacturing and marketing of ice cream. In such an environment, students will have opportunities to work in the different roles in the myriad sections of running a real business entity.

Licensed to operate under AVA with a Food Establishment License, KoolWerkz presently produces 3 flavours of frozen desserts namely Green Tea, Mango and Strawberry flavours. These desserts packed in tubs of 100ml, 445ml, and 5 litres may also be packed into customised freezer containers provided by customers.

In AY 05/06, a total of about 200 students from Business, Engineering and Design Schools are expected to benefit from KoolWerkz, either in research projects or subjects related to KoolWerkz.



The low-fat green tea frozen dessert is collected in specially designed tubs



Production of the green tea desserts in progress

Heat Pipe Technology for Oil Refinery Company

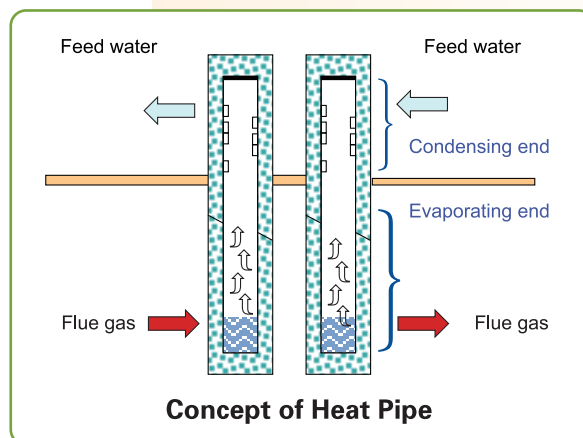


The waste heat recovery system (above) saves energy and money

In April 05, ASc collaborated with Envirostar (S) Pte. Ltd. a local company specialising in environmental engineering projects, to install a waste heat recovery system for PGEO Edible Oils Sdn. Bhd., a palm oil refinery located in Pasir Gudang, Johor.

The project used heat pipe technology to address the common corrosion problems faced by conventional technology in industrial waste heat recovery projects. The heat pipe technology was chosen as its super thermal conductivity can overcome the low temperature corrosion phenomenon related to the presence of sulphur in fossil fuels. Such applications are becoming more important in recent months due to the rising fuel cost that has prompted many companies to look into innovative ways to conserve energy to remain competitive.

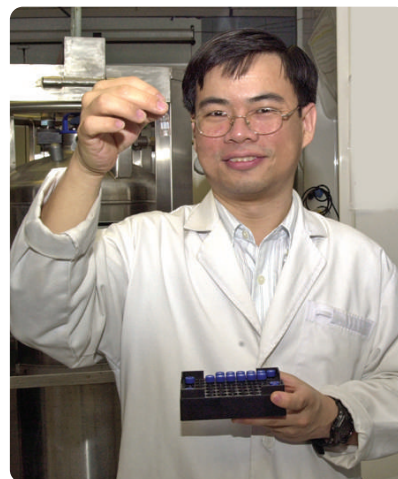
The project has not only helped to conserve the environment, but has also led to substantial cost savings for PGEO.



TCM Research Presentation at International Conference

Lecturer Dr Ong Eng Shi and his co-researchers have blazed a research trail for Traditional Chinese Medicine. At the **International Congress on Complementary and Alternative Medicines 2005** organised by the National University of Singapore in February, Dr Ong Eng Shi and his team of co-researchers, Ignatius Tan, Lee Yian Hoon and David Goh shared their research insights on Traditional Chinese Medicine. Two studies headed by Dr Ong were presented at the congress. One was on the

results of their study on the toxicity of botanical extracts. The other study, communicated through poster presentations, featured their research on the potential use of TCM in the treatment of cancer. Prior to the presentation, Dr Ong published a paper in the **Journal of Agricultural & Food Chemistry**, an international scientific research journal. Focusing on the inhibitory effects of *Scutellaria barbata* in human colon cancer cell lines, the paper was rated 'highly original' by scientific reviewers.



Dr Ong presented two studies at the International Congress on Complementary and Alternative Medicines 2005

Hydroponic Innovation Impresses Conference



Dr Leow presenting his paper at the International Conference and Exhibition of Soilless Culture 2005

Research scientist Dr Atomic Leow presented a paper on **Innovative Precise Influx Hydroponic Orchid Growth System** at the International Conference and Exhibition of Soilless Culture 2005 held at Fort Canning Gallery in Singapore, from 5 to 8 Sep 05. His presentation generated much interest and numerous enquiries from scientists and entrepreneurs from Australia, Kuwait, America and Malaysia.

Impressed by the presentation, Steven Carruthers, the Managing Editor of the renowned Australian magazine *Practical Hydroponics & Greenhouses*, has invited Dr Leow to contribute an article to the magazine. Mr Carruthers is convinced that ASC's hydroponics invention would have a great economic impact on the orchid industry worldwide, especially in Hawaii and Queensland.

A paper entitled '*Revolutionary Hydroponic System for Commercial Cut Orchids and Potted Orchids Production - Precise Influx Hydroponic Growth System*' written by Dr Leow and Mr Thomas Tan of AVA has been published in Issue No. 86, January and February 2006 Edition of the *Practical Hydroponics & Greenhouses* magazine.

Entrepreneurship with a Cause

Final-year students Janice Chew, Tan Shee Wee, Yvonne Looi and Wendy Lee are youths with a cause. And under the auspices of the **Citibank-YMCA Youth for Causes** scheme, their spirit of volunteerism and entrepreneurship earned them a TP merit award of \$500.

The Citibank-YMCA Youth for Causes scheme is based on a concept of social community entrepreneurship whereby youths are challenged to propose entrepreneurial projects to benefit non-profit organisations (NPO). Once their proposals are approved, Citibank will award the youths \$1600 as seed money to raise more funds for a beneficiary of the group's choice.

The girls, from the Diplomas in Biotechnology and Biomedical Science, chose to support the Children's Cancer Foundation. Their business proposal, *Test Tube Rock Chocolate Candies*, was one of the nine proposals awarded seed money of \$1600. The idea behind their proposal is highly symbolic. By combining test tubes with rock chocolate, they wanted to show that even though the cancer-stricken children's lives revolve around laboratory testing and medical treatments, tender care and a generous donation could make their lives as sweet as chocolate. It is no wonder why the girls decided to name their group **CARElicious** – the group that shows **CARE** by selling *delicious* snacks.

They were supported in their entrepreneurial journey by AppleStiz™. Ms Jan Ho, Manager of AppleStiz™, had only praise for the girls. She described their enthusiasm and passion as reassuring and encouraging that it prompted AppleStiz™ to want to contribute back to society by investing in young talent like them.

CARElicious' total sales generated a profit of \$754. The profit, together with the seed money, was donated to the Children's Cancer Foundation.



The CARElicious girls with their Test Tube Rock Chocolate Candies during a fund raising event at Suntec City

Students Win 2nd Prize in BEST Competition

ASc has proudly put another feather in its entrepreneurial cap. Students Serene Tan, Linda Sim and Vanessa Huang from the Diploma in Applied Food Science & Nutrition, together with Kelly Latimer from the School of Business bagged the 2nd prize in the BEST Competition held on 17 Aug 05.



From left: Linda, Vanessa, Kelly and Serene with their \$1000 cheque

The BEST (Business Excellence Simulation Training) competition is a game developed by NTUC Income to simulate the challenges managers face in today's dynamic business environment. This interactive simulation programme incorporates real business practices and decision-making skills, covering the functional areas of production, marketing and human resource.

The students had to take on an active role in running a company on the macro and micro levels. At the macro level, they had to look into issues of manufacturing, insurance and hospitality. At the micro perspective were issues of operational processes such as underwriting, budgeting and recruitment. The game placed emphasis on entrepreneurship and prompt decision-making skills.

The win was especially competitive for the girls as they beat eight other groups from the five polytechnics to win the 2nd prize, missing the 1st prize by just 0.52 marks.

Double Win at ENnovation 2005



TP's Trail Blazer team impressed the judges with its vision for Singapore's environmental sustainability

Call them the ENnovators. That is because these students from the Diploma in Chemical Engineering (ChE) did TP proud by innovating with an environmental twist at ENnovation 2005.

ENnovation 2005 was a 2-day event jointly organised by the Ministry of the Environment and Water Resources, National Environment Agency and Public Utilities Board. It was launched to showcase innovations in the environment industry. The event sought to create greater awareness as well as inspire new ideas to protect the environment.

At the Enviropreneur Pitch, one of the ChE teams shared their project on retrieving valuable metal from acid wastes generated by local industries using membrane technology and electro-deposition. The project won the 2nd prize as it impressed the judges as being both environmentally friendly and commercially viable.

Another ChE team defeated teams from the universities, polytechnics and the private sector in the Trail Blazer Competition which was styled very much like the Amazing Race. Besides winning the race, the team also cleverly presented its vision for Singapore's environmental sustainability by incorporating TP's 15th Anniversary theme, "It's all About People".

Student Secures Lead Award



Derek (standing far right) with the other participants

Derek Lim has every reason to be proud of himself. He is one of the 12 youths who clinched the LEAD (Leadership and Adventure) Award for exemplary involvement in co-curricular activities and community service.

The award, given by the North East Community Development Council, is open to youths from tertiary institutions in the northeast region of Singapore. To receive the award, participants had to:

- be involved in a community service project
- take part in a 21-day Classic Outward Bound adventure course

The entire experience gave Derek, a Consumer Science & Technology student, an insight into his own abilities. He discovered a new sense of tenacity and courage he never knew he had. The highlight of the experience was the 4D3N kayak expedition around Singapore where Derek relearned the meaning of teamwork, leadership and risk management.

Thanks to the award, Derek's newfound inner strength is impacting the way he manages his work. He is certain it will benefit his future students when he eventually becomes a secondary school teacher.

Merit Award in Green Wave Competition 2004

Have you ever stood near the back of an operating air conditioner and felt the heat emitting from it?

Students Tan Si Yan Jovina, Lim Jian Long Kenneth and Nurul Huda Bte Hashim from the Diploma in Chemical Engineering decided to tap the waste heat energy by modifying a window air con unit to produce hot water for domestic applications such as bathing.

This concept helps to reduce electrical consumption in homes and buildings, thereby conserving the environment and achieving cost savings at the same time. The project won the team a Merit Award in the Green Wave Environment Competition 2004.



Mr Tharman speaking to our winners at the Green Wave Environment Competition 2004

O v e r s e a s



Mong Siying, with fellow ASc student Melissa, enjoying the scenery at Xianmen

THE CHINA EXPERIENCE

Chemical Engineering student Mong Siying was elated when she was shortlisted to do her student internship in Xiamen, China, from Jun to Oct 05. Her attachment was with Suntar Membrane Technology, a leader in advanced membrane technology and a core subsidiary of Sinomen, an SGX-Mainboard listed company.

Working in the membrane cleaning department, Siying had to complete her project on '*Membrane Cleaning Methods for Different Types of Membrane Fouling*'. She was guided by supervisors, Dr Wang Shu, an expert in membranes, and Mr Wu Zhang Feng, a specialist in surfactants.

She faced several challenges but she ultimately surmounted them. One was to discover an improved formula for membrane cleaning. Another was to understand technical jargon in Mandarin.

It wasn't all work for Siying. She travelled, met new people and learnt the country's culture. According to Siying, TP's lecturers and facilities fully prepared her for the experience. The stint was priceless and if given a chance, she would not hesitate to work in China.

THE INDIA EXPERIENCE

Yogeshwari is a perfect example of resourcefulness. She found her dream internship company while surfing the internet and wrote in directly to its Deputy Director, Dr Rengarajulu Puvanakrishnan, requesting for a placement. And that was how Yogeshwari snagged her attachment in the Central Leather Research Institute (CLRI) India, the biggest leather research institute in the world.

A Biomedical Science student, Yogeshwari worked on a project entitled, '*Studies on Biochemical and Electrophysiological Parameters in Ischaemic-Reperfusion Injury in Rats*' from Nov 04 to Feb 05. Working independently on her research project, she had to ensure that her project was ethically sound. Knowledge gained from her course work modules fully prepared her for her overseas stint.

Despite hailing from India originally, Yogeshwari still found her work experience in India refreshing and thrilling.



Yogeshwari giving a thank-you gift to the Institute's Deputy Director

Internship

THE VIETNAM EXPERIENCE

Ian Lee Kang Chien wanted the adventure of working in a foreign country to get out of his comfort zone while Ali Eimran hoped to get a free vacation during his internship. Both students got more than they had bargained for when they were jointly selected by the Executive Director of Behn Meyer, Vietnam, an international chemical company.

During their attachment from Nov 04 to Feb 05, both students from the Diploma in Biotechnology had to test a new range of products designed for use in the aquaculture industry. Although their office was in Ho Chin Minh City, they were sometimes required to take a 6-hour drive to the Mekong Delta where they sometimes had to trudge through mud to get their work done.

Adapting to the new environment was a skill they needed the most. For example, many of the standard equipment used in the ASc laboratories was not available, making it necessary to improvise. The boys also realised the importance of interacting with the locals as it was the only way to quickly overcome their language difficulties. It worked to their advantage as they discovered that business in Vietnam was conducted over food and drinks. Both were fortunate to have colleagues who helped them understand the cultural differences.

To sum up their experience, Ian quoted the poet, Robert Frost:

*Two roads diverged in a wood, and I—
I took the one less traveled by,
And that has made all the difference.*

THE THAILAND EXPERIENCE

Lynda Ann Leong Chin Leng intends to set up her own business in the baking field and her overseas stint has confirmed this desire all the more.

For nine weeks in 2005, Lynda, an Applied Food Science and Nutrition student was attached to U.S. Wheat Associates in Bangkok, Thailand. The company sells raw wheat grown in the U.S. to companies around the world. It also conducts courses to educate people in the industry about the use of flour and its applications.

Lynda assisted her supervisor, Mr Roy Chung, a bakery consultant and lecturer, in facilitating his courses and preparing for his bakery workshops.

The attachment accelerated Lynda's cross-cultural education – it was an invaluable experience she would have missed had she stayed in Singapore.

On the whole, it was a gratifying experience to learn from her supervisor, live independently, enjoy the company of her new friends and relish Thai cuisine.



Greasing pans for an experiment



Linda with her supervisor, Mr Roy Chung

Commitment to Co

At ASc, staff are committed to lifelong learning whether it is through conferences or seminars.

17TH SINGAPORE PHARMACY CONGRESS

To keep abreast of the development and trends in the pharmaceutical industry, Dr Vijayakumari Seevaratnam, Course Manager of the Diploma in Biomedical Science, and lecturers Ong Puay San and Magdeline Hor attended the 17th Singapore Pharmacy Congress from 1 to 4 Jul 05 at Grand Copthorne Waterfront Hotel, Singapore.

This annual congress, themed *Translating Science, Optimising Healthcare*, was organised by the Pharmaceutical Society of Singapore and the Department of Pharmacy (NUS). Over 600 delegates comprising members from Western Pacific Pharmaceutical Forum and Commonwealth Pharmaceutical Associations, faculty members from the Department of Medicine and Department of Pharmacy, NUS, and pharmacists and executives from the industry attended the conference.



Having attended this congress, the lecturers hope to transfer the knowledge acquired into the Biomedical Science subjects to ensure that students remain on the cutting edge of industry trends.

WATER QUALITY SEMINAR

Lecturer Kok Chor Wee had a snapshot of the various types of systems for producing water for pharmaceutical use when he attended a seminar on *Water for Pharmaceutical and Biomedical Use* on 9 Jun 05 at the Hilton Hotel Singapore.

At the seminar, he also learned about the engineering requirements for producing pharmaceutical water and the validation process of a typical water system.

Chor Wee hopes that the knowledge gained will be useful when ASc develops its own capability to produce pharmaceutical water for biomedical research. This knowledge will also be incorporated in the subject Bioprocess Technology.

13TH BIENNIAL INTERNATIONAL CONGRESS OF ARAHE

Lecturer Karen Chan updated herself on the latest trends in Home Economics education when she attended the 13th Biennial International Congress of Asian Regional Association for Home Economics (ARAHE), at the Orchard Hotel Singapore from 2 to 5 Aug 05.

Themed *Developing Values, Innovation and Enterprise in Home Economics*, the congress saw an exchange of ideas on

- entrepreneurship in education and the industry
- consumer and gender issues
- family economics
- child and family relations
- diet and nutrition

The four-day event was attended by more than 400 home economics educators, researchers and industry professionals, with representation from about 14 countries. It was heartening to note that several ASc graduates from the Diploma in Consumer Science & Technology were in the organising committee of the conference.

Continuous Learning

LABORATORY AUTOMATION CONFERENCE

Laboratory automation originated in Japan more than 20 years ago and to date, less than 30% of clinical laboratories in the US, Europe, Korea and Japan are fully automated. Fully automated laboratories deliver more laboratory tests results in less time and utilise fewer resources.

As Singapore aspires to be a medical hub in the Southeast Asian region, two of her major hospitals, National University Hospital and Tan Tock Seng Hospital have embarked on full laboratory automation. Other hospitals will follow suit when the timing, space and necessary resources are available.

With this backdrop in mind, lecturer Alvin Poh attended the **American Association for Clinical Chemistry Laboratory Automation Conference: Smart Strategies for Success** from 12 to 13 May 05 at Orchard Hotel Singapore. At the conference, experts in the field of laboratory medicine - pathologists, laboratory managers, medical technologists, educationists – and 6 major vendors from over 30 countries converged to share their expertise and experience.

With the knowledge gleaned, Alvin hopes to institute some changes in the teaching curriculum of Biomedical Technology. The thrust will be to prepare students to adapt to and be technically competent in a fully automated and integrated laboratory.



A student performing gavage, a safe and ethical method of introducing accurate dosage for research

BASIC TRAINING ON ANIMAL RESEARCH ETHICS

It may have been April Fool's Day but it was certainly not a day for fooling around with animals. Course Manager for the Diploma in Biotechnology, Dr Diana Chan and lecturers Mrs Viji Vijaykumarr and Dr Jason Chang attended a basic training workshop on how to conduct animal research while maintaining high standards of ethical responsibility.

The full-day workshop, conducted by the Institutional Animal Care and Use Committee (IACUC), was the result of an initiative by the Agri-Food and Veterinary Authority (AVA) and the Singapore Association for Laboratory Animal Science.

Participants included staff from research and academic institutions such as A*STAR, AVA, DSO National Laboratories, NUS, NTU, TP, NP and staff from commercial life sciences companies. At the workshop, participants shared their experiences and alerted new IACUC members to the many potential problems they might face in the handling of animal research in their institutions.

The knowledge gained at the workshop is crucial as the Veterinary Science Option in TP requires the use of live animals for teaching and research. As head of TP's internal IACUC, Diana and her team will have to ensure that all research performed on animals meet IACUC guidelines.

Passport to Proteomic Technology in ASc

To spearhead proteomic capability development in ASc, lecturer Dr Quek Hung Hiang went on an 18-month attachment at Becton Dickinson (BD) Diagnostics, a world leader in medical devices, in New Jersey, USA.

Proteomics is a technology used to identify proteins to be used as diagnostic markers, therapeutic targets, prognostic indicators and vaccine candidates.

At BD, Hung Hiang was attached to the Preanalytical Systems division from Jan 04 to July 05, where he learnt to perform proteomic analysis on plasma samples using several proteomic techniques like:

- 2D gel electrophoresis
- Microarrays, MALDI mass spectrometry
- Free Flow Electrophoresis (FFE)

During his attachment, he was involved in the feasibility study of the FFE Technology as BD was then considering the acquisition of a German company and its FFE technology. Hung Hiang was in a three-man team that made the first trip to Munich, Germany, to carry out a preliminary analysis on the FFE. Consequently, he participated in the technology



Dr Quek Hung Hiang (right) with his colleagues from the Growth Technology Group of Companies at the HUPO 5th Annual World Congress in Munich, Germany, in Sep 05

evaluation at Franklin Lakes as well as at the University of North Carolina, USA.

His work at BD culminated in poster presentations at the **US Human Proteome Organisation Meeting (US-HUPO)** at Washington DC in Mar 05 and the 4th International Human Proteome Organisation (HUPO) World Congress at Germany in September 2005. His poster presentation was on *Separation of Functionally Active Wild Type Enzyme and Point Mutants Using Free Flow Electrophoresis (FFE)*.

Thankful for a very spiritually enlightening, intellectually empowering and culturally enriching experience, Hung Hiang looks forward to offering proteomic-based projects to students doing their Major Projects or for Student Internship Programmes in collaboration with industry. He also plans to organise in-house seminars to update staff on proteomics.

Renovation of the Temasek Animal Facility

To engender the spirit of continuous upgrading in the teaching of the Veterinary Science Option and meeting National Advisory Committee for Laboratory Animal Research (NACLAR) requirements, the animal facility was completely upgraded in Aug 2005. From a one-room unit for holding animals for teaching purposes, it has now been transformed into a 370-square metre facility comprising both Aquaculture and Laboratory Animal Workstations.

The Aquaculture Workstation consists of a fish quarantine room, four 3000-litre fish tanks using a closed re-circulatory system, hatchery tanks and reservoir tanks for holding sea water. The Laboratory Animal Workstation consists of essential amenities such as

animal quarantine room, Animal Holding Unit (AHU), Bedding and Feed Storage Room, Procedure Room, Necropsy Area and a Wash Area. An additional amenity is the Surgery and Animal Preparation Room meant for activity involving non-laboratory animals. The new facility is now known as the Temasek Animal Facility.

With the new facility, staff would be able to inject more realism into their teaching and research with greater ease. The new facility will enable ASc to conduct more training courses for external organisations and expand current joint training with Tan Tock Seng Hospital. Animal Welfare and Education/AVA has recognised TP as one of the three training providers under NACLAR Training Guidelines

for responsible animal care and use for scientific purposes. Also in the pipeline are training courses for Pet Enterprises Traders Association of Singapore (PETAS) and pet shop owners.

ASc aims to become a leading training provider of animal care for fish, laboratory animals or companion animals.



The facility will allow staff to inject more realism into the teaching of animal care

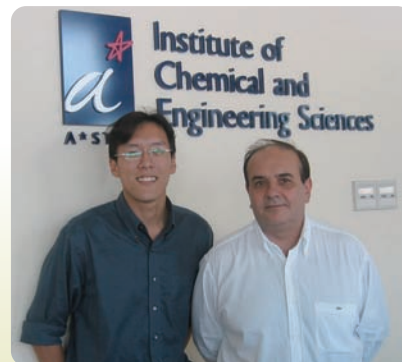
Learning about Nanotechnology at ICES

Sitting on the shoulders of giants – that was how lecturer Wallace Lim described his 4-month industrial attachment at the Institute of Chemical and Engineering Sciences (ICES) on Jurong Island. He was there from May to Sep 05 to study the various synthesis and characterisation techniques used in nanotechnology in order to set up a nanotechnology research laboratory in ASc.

At ICES, Wallace was attached to the Applied Catalysis Department where he learnt frontier technology under the guidance of Dr Armando Borgna, a research scientist and team leader for the Methane and Hydrogen group.

For his attachment project, Wallace had to design a new nanocatalyst that would help ease fuel problems. As the new synthesis route is yet to be found, ASc will be working on this through collaborative projects with ICES as well as through the school's Differential Research Programme.

Wallace's stint has honed his research and technical skills. While he feels gratified for the exposure in the use of X-ray diffraction system, X-ray photospectrometry, transmission electron microscopy and extended X-ray absorption fine structure spectroscopy, he is also humbled by the fact that this learning is only the tip of the iceberg.



Wallace (left) learnt a lot under the guidance of Dr Borgna (right), a research scientist at ICES

Staff Lend Expertise

ASc's team of dedicated professional staff has certainly made its mark in the industry. Three of our staff members were invited to share their expertise in their respective industries.

Dr Vijayakumari Seevaratnam, the Course Manager for the Diploma in Biomedical Science, was invited by Changi General Hospital to be one of the judges for the *2nd Changi General Hospital Research Forum Allied Health Best Paper Competition* held on 15 Jul 05. This competition garnered project papers from the hospital's various support services. These include the pharmacy, physiotherapy, laboratory medicine and clinical diagnostics departments.

Dr Atomic Leow, Head, Biotech Specialist Unit (Hydroponics), was selected to sit on a panel of eight specialist judges at *Biotech Fair 2005* on 14 Sep. The Biotech Fair is an annual event organised by the Singapore Science Centre for secondary school students. The students work in teams to submit projects based on the general theme of biotechnology. A total of 55 projects were submitted and the top 8 entries were awarded prizes by the Singapore Science Centre.

Recognised for his expertise in the field of Analytical Chemistry, **Dr Ong Eng Shi** was invited by the Nanyang Technological University to be the external examiner for a Master of Science thesis written by a postgraduate student from the National Institute of Education.



Dr Leow (far right) judging students' projects at Biotech Fair 2005

Going 'GREEN' can be Profitable

Environmental conservation and business profitability are not mutually exclusive. That was the main message at the Green Productivity Seminar hosted by ASc on 27 May 05.

Green Productivity is a strategy for simultaneously enhancing productivity and environmental performance for overall socio-economic development. The guest of honour, Director, Office of Safety, Health and Environment in National University of Singapore, Dr Peck Thian Guan explained, "Green Productivity marries two very important concepts in today's context. 'Green' refers to environmental conservation and 'Productivity' means improving business profitability."

Other speakers at the seminar were:

- Dr Tan Yi, Senior Manager (Technical Development), Hyflux Limited
- Mrs Lily Lien, Business Development Manager, United Envirotech Limited
- Mr Francis Cheong, EHS Manager, British American Tobacco (S) Pte Ltd

ASc lecturer Mr Tay Boon Keat also spoke on how resource conservation and waste minimisation efforts could be implemented in the manufacturing industries to reduce the negative impact on the environment.

Some 150 participants from the chemical, pharmaceutical and food industries attended the seminar. Also present were staff from hospitals, research institutes and secondary schools.

Collaborating with the Food Industry

The academic year 04/05 saw a record number of collaboration projects undertaken by ASc to solve technical problems. The collaborations came about either through direct requests from industry or through referrals by our very own graduates.

Companies ASc worked with ranged from SMEs to MNCs. Staff from the Diploma in Applied Food Science & Nutrition assisted the companies in the areas of product development, shelf life study, nutrient testing, consumer acceptance, and hazard analysis and critical control point (HACCP).

In the Nutrition section, there were 11 projects with the industry. The industry partners included the Health Promotion Board, Singapore Heart Foundation, Country Foods, Food & Nutrition Consultants and major hospitals like Changi General Hospital, KK Women's & Children's Hospital, Alexandra Hospital, National University Hospital, Mt Alvernia Hospital and Singapore General Hospital. Projects included diet prescriptions and nutrition education programmes.

One happy client is Dried Pork Food Trading, a company that manufactures *Bak Kua*. ASc assisted them in improving their manufacturing process.



Speakers at the panel discussion:
From left: Dr Tan Yi, ASc Lecturer Mr Tay Boon Keat,
Guest-of-Honour Dr Peck Thian Guan, Mr Francis Cheong and Mrs Lily Lien

ASc is Certified RCULA Trainer

It is still in its infancy, but the Veterinary Science Option for the Diploma in Biotechnology has already made inroads in the industry. A course on **Responsible Care and Use of Laboratory Animals** (RCULA) is now offered to personnel involved in animal care and use.

RCULA is a basic training course required under the National Advisory Committee for Laboratory Animal Research (NACLAR) training guidelines for responsible animal care and use for scientific purposes.

The Animal Welfare and Education Division AVA, has approved the course curriculum and accepted Temasek Polytechnic to be one of the three locally recognised training providers for this AVA-listed course.

Our first participants for the course were from Tan Tock Seng (TTSH) and the National Neuroscience Institute. The Laboratory Animal Centre (NUS) was instrumental in recommending ASc to be the course facilitators. The course started in Mar 05 with participants having to complete



Dr Diana Chan, (seated third from left) with participants of the RCULA course

e-lectures and self-assessments before attending a full-day hands-on workshop at TTSH on 8 Apr 05.

Participants' feedback on the course was extremely positive with at least 94% of the participants saying that the e-lectures were well organised, useful and more than adequate. The hands-on workshop was equally well received as participants found the teaching staff skilled and knowledgeable. Certificates of participation were jointly issued by TP and TTSH, a co-organiser of the course.

Science.05 Workshop for Teachers

As part of ASc's ongoing commitment to staying connected with the secondary schools, a workshop on **Plant Tissue Culture Using Micro Propagation Method** was organised on 5 Sep during the Science and Technology Month in 2005 for 17 teachers.

The teachers who attended the workshop were taught:

- in-vitro tissue culture techniques
- basic principles of tissue culture

They also had hands-on practice on media preparation and micro propagation of selected plants such as roses and orchids. Some teachers found the workshop so interesting and educational that they are even contemplating setting up their own micro propagation projects for their pupils.



Teachers enjoyed the demonstration on media preparation and micro propagation of roses



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