

RIOT

REVOLUTIONARY
IDEAS
OUT-OF-THE-BOX
THINKING

TO KILL A KILLER | p04

SEAS GET BREATH
OF NEW LIFE | p26

INVASION OF THE
MECH WARRIORS | p32

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IDEAS
OUT-OF-THE-BOX
THINKING**

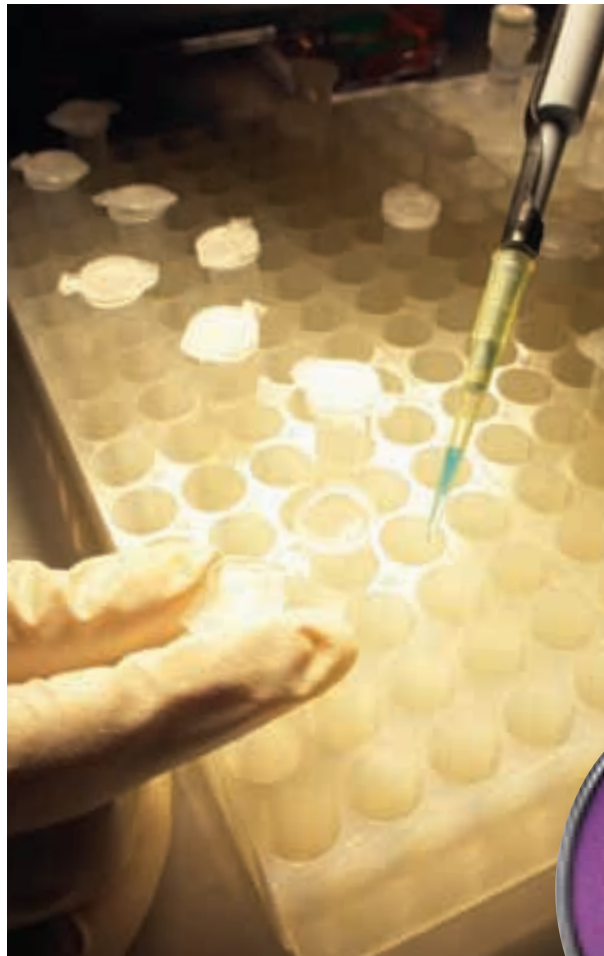
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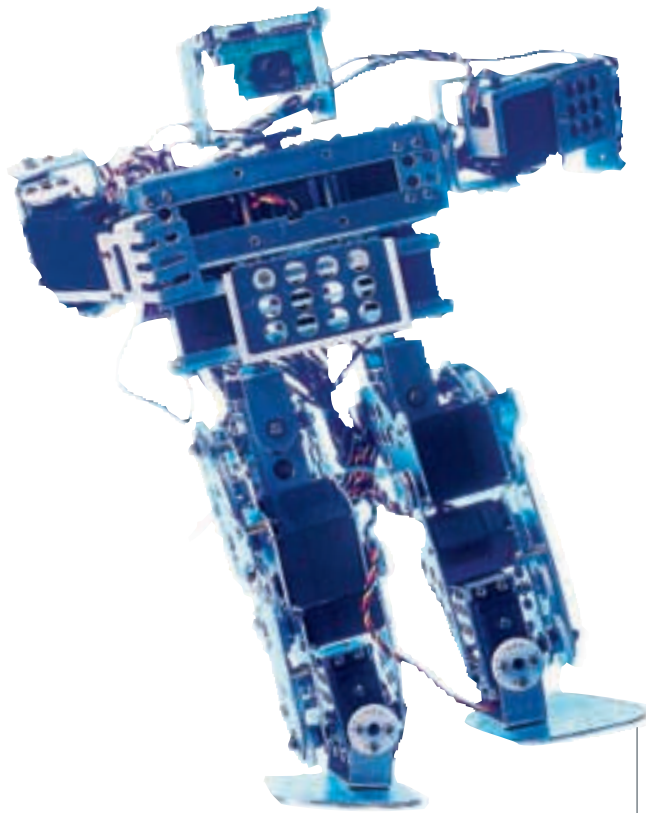
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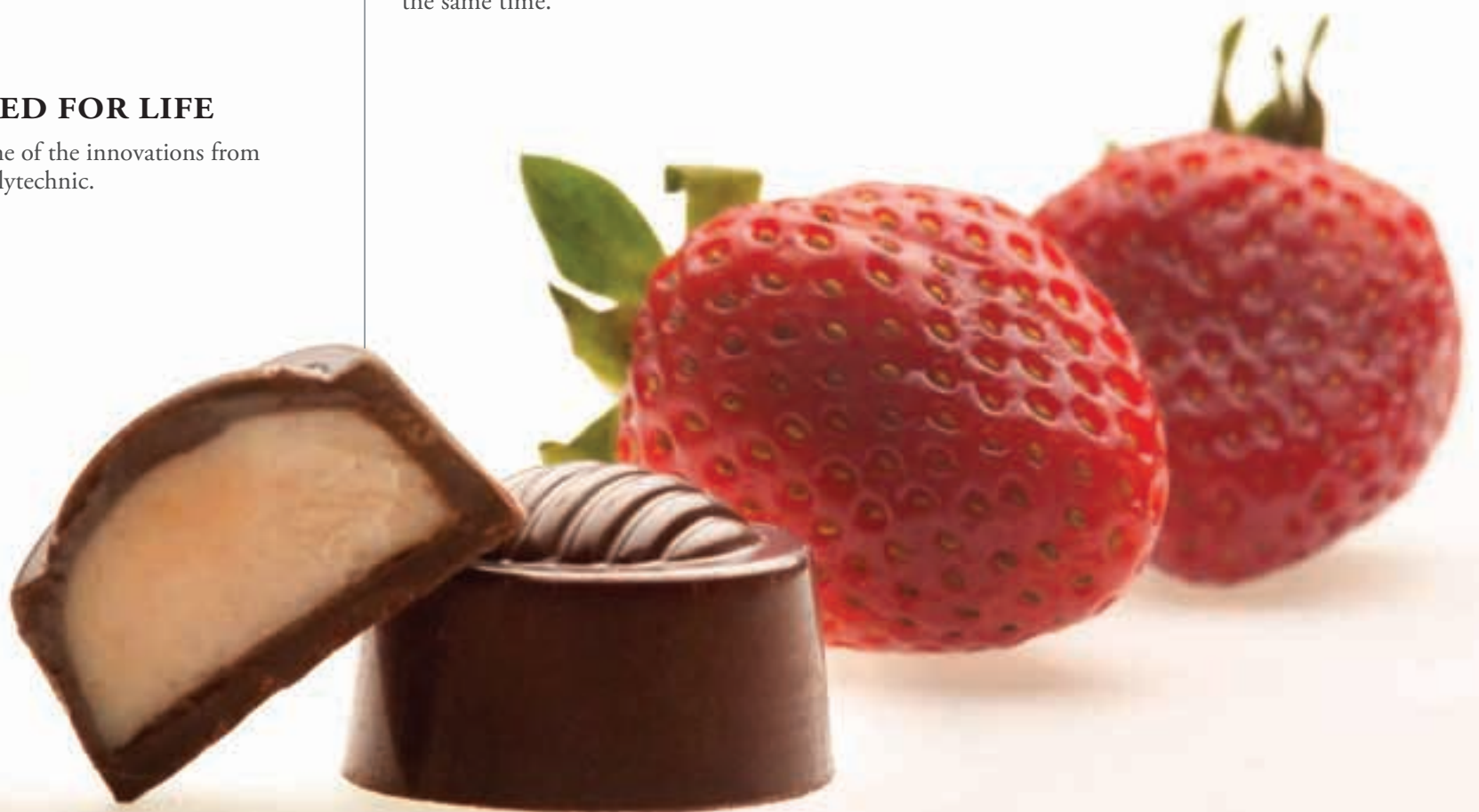
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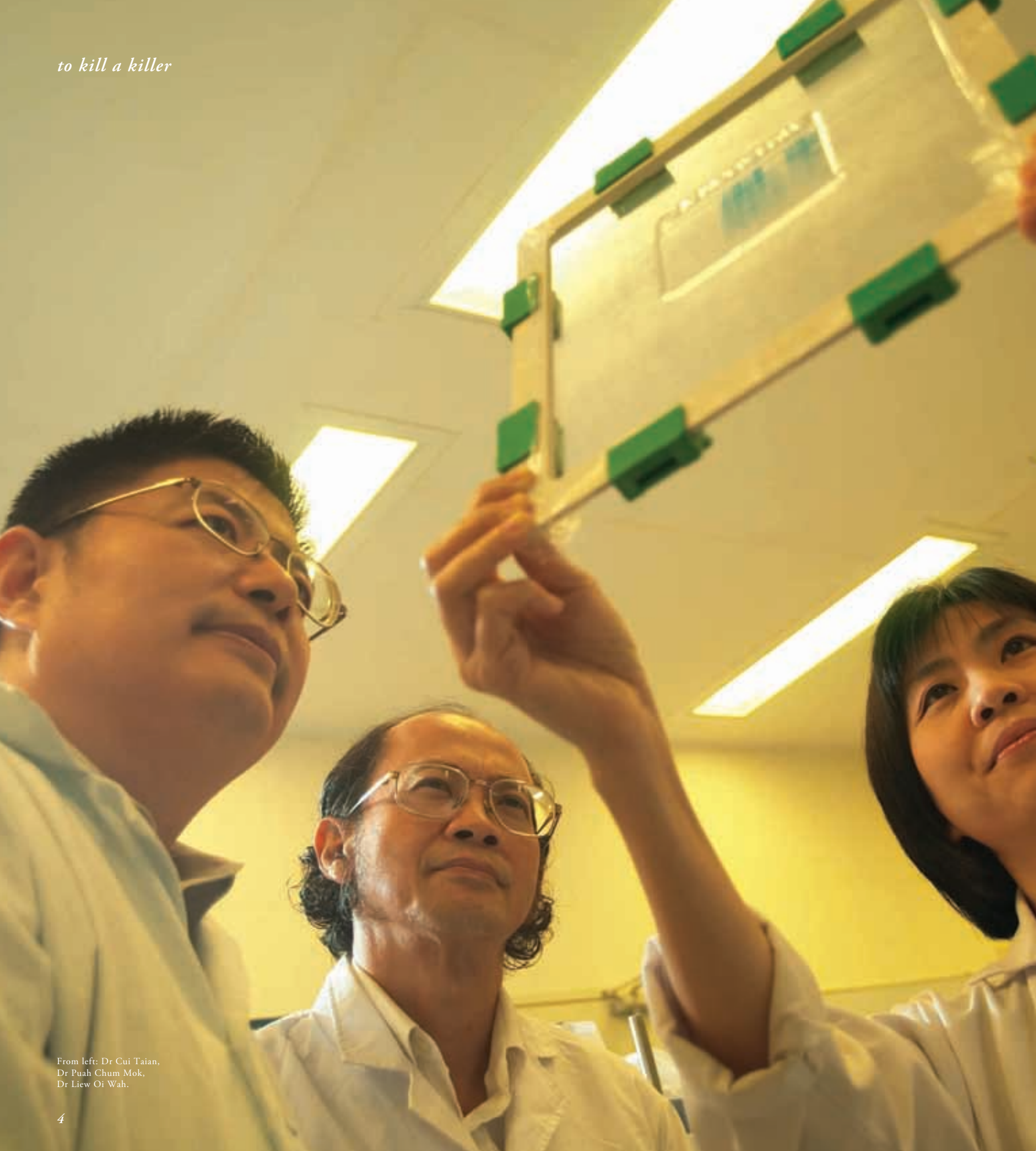
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AND THE AWARDS GO TO...


Talk about multi-tasking! SP students get creative, gain recognition and win awards at the same time.



to kill a killer



From left: Dr Cui Taian,
Dr Puah Chum Mok,
Dr Liew Oi Wah.



In a nondescript laboratory on the Singapore Polytechnic campus, Dr Puah Chum Mok and his team fight a clandestine battle against dengue using supercomputers. And it seems that the biochemist is winning this round.

To Kill a KILLER

Got a little red insect bite that itches? Chances are, it's a mosquito bite and it's all in a day's work here in Singapore. With its lush vegetation and balmy climate, this garden state is home to a thriving tropical ecosystem that includes verdant flora, fauna and, of course, insects. Unfortunately, this includes the hated *Aedes aegypti* mosquito, source of the potentially fatal dengue disease.

The number of dengue cases in Singapore has been steadily rising. In the first 24 weeks of 2007 alone, there were 2,868 cases of this mosquito-borne disease, up from just 1,392 in the same period for 2006. And out of these, three deaths resulted, while there were none last year.

The local authorities are acting to combat this alarming rise in dengue cases. An on-going anti-dengue campaign, with posters, television advertisements and celebrity endorsements, constantly reminds the public of dengue's dangers. It is clear that the battle against dengue is hardly over.

With its tropical temperatures and regular rainfall, Singapore—like many of its neighbours in this part of the world—is the ideal breeding site for the *Aedes* mosquito. Although the mosquito thrives in rainy seasons, it can breed all year round where stagnant water is present. All it takes is a single *Aedes* bite and voila! The unfortunate victim will begin exhibiting full-blown symptoms of dengue within three to 15 days. All without knowing when or where he or she caught the disease.



And here's the crunch—there is no known cure or vaccine against dengue. You can't get an immunisation jab against dengue, nor can you dose yourself with antibiotics to get rid of it. Considering that the disease was first identified and named in 1779, it has survived remarkably well despite the advent of 21st century medicine. To this day, it remains a virulent health threat in many tropical and sub-tropical countries.

But this will not be for long, if all goes well for Dr Puah Chum Mok and his team.

The biochemist, Centre Director of Singapore Polytechnic's Centre for Biomedical and Life Sciences, is leading his team in a virtual battle against the dengue scourge using supercomputers and a technological platform known as VHTS, or Virtual High Throughout Screening.

Instead of searching for the elusive cure or vaccine for dengue, Dr Puah attempted to stop the virus from replicating. This, he explained, follows the principle behind existing treatments for HIV patients, which tries to modify the virus to stop it from multiplying, thereby controlling the disease. To achieve this, Dr Puah needed to find a chemical compound that will modify the dengue NS3 protein, which is responsible for the virus' replication.

After two years of research using a supercomputer to position millions of molecular chemical compounds into a virtual model of the NS3 protein, the team identified not one but 14 chemical compounds that could possibly stop the dreaded virus from replicating.

In experiments with cloned specimens of the NS3 protein, these 14 compounds have successfully bonded with the protein, thus modifying it and preventing the virus from replicating. Singapore Polytechnic has filed for patents on the 14 chemical compounds.

Said Dr Puah modestly, "It is too early to declare our dengue project a success. What we have done so far is simply to identify some compounds that can potentially inhibit the activities of the viral protein involved in the reproduction of the virus. This fact was backed up with binding studies using cloned viral proteins. The next stage is to add our compounds onto live viruses. Only when we see the positive effects on the viruses do we dare to declare a success, albeit a small one."

The project's next 'live' stage will see the Singapore Polytechnic team working with an external party. The 14 chemical compounds will be tested on all four live strains of the dengue virus.

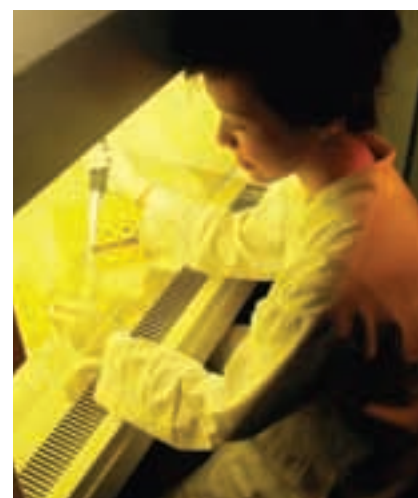
Dr Puah revealed that this could take up to two years. Only then would the project be ready for the next phase—animal studies and cell cultures—to ensure that the compounds are not toxic to humans.

The biochemist admitted that it was early days yet. But he was quietly optimistic about his research project. "It takes up to US\$1 billion and 10 years to develop a drug," he said. "We are just at the very beginning of a long process." If Dr Puah's rounds of tests prove successful, the project will likely pass into the hands of any one of the large pharmaceuticals with the financial and technical clout to develop it into a drug against dengue.

As for Dr Puah and his team? They will likely plunge straight into another project, braving uncharted territories in the nebulous world of biochemistry and searching out other cures.

**"THE AIM IS TO SPIN
OFF AND DEVELOP NEW
PRODUCTS, PATENTS AND
TECHNOLOGIES."**

– Dr Puah





SINGAPORE: A LIFE SCIENCES HUB

Instead of Internet startups, these days we have biotech startups. The discovery of the human genome in 2000 changed the dynamics and economics of the biotech industries and propelled the life sciences into international limelight. Indeed, the life sciences have become one of the most exciting scientific disciplines in the world.

For Singapore, which is reliant on its human potential as her primary resource, the life sciences—with its high-value, capital-intensive requirements—is a perfect investment.

Already, the government has put in place various initiatives to promote the island-state as a life sciences hub. This includes a stunning state-of-the-art facility aptly named Biopolis at One-North. The aim is to make the life sciences one of the four pillars of the country’s manufacturing sector, after electronics, chemicals and engineering.

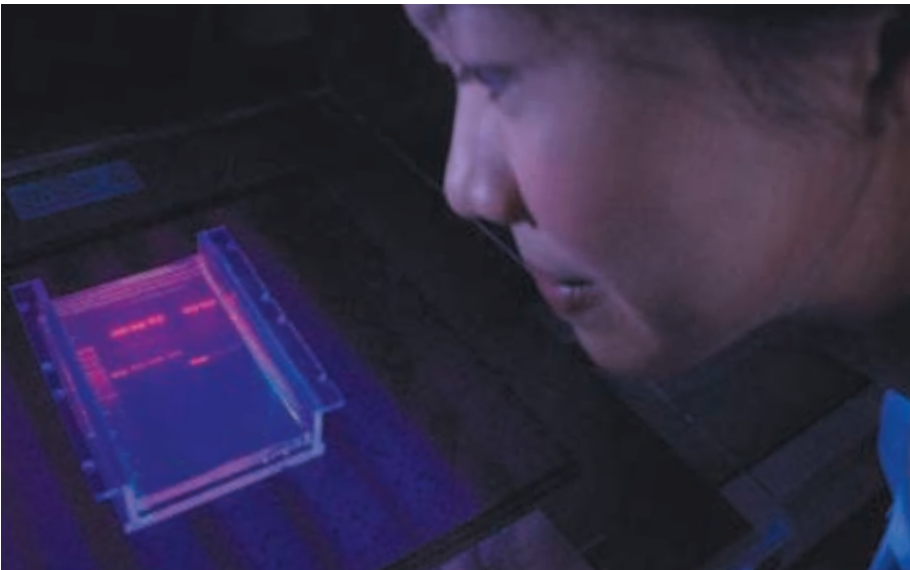
Singapore Polytechnic’s School of Chemical and Life Sciences offers several diploma and advanced diploma courses to provide trained professionals for Singapore’s budding life sciences industry. Dr Puah elaborates, “Besides training the required manpower for the bio-industry, we can also play a small role in conducting applied R&D research—i.e. small ‘r’ with big ‘D’.”

The big ‘D’ that Dr Puah speaks of refers to the development of products that can be licensed to businesses. For instance, the formulation of the “Lemonsi Delight” drink which was commercialised by Pokka Singapore and the creation of a perfume for 2004 Romancing Singapore Festival count as some of Singapore Polytechnic’s more commercial and mainstream offerings. Others include industry-scale projects like Dr Puah’s dengue research.

Says Dr Puah, “The aim is to spin off and develop new products, patents and technologies.”

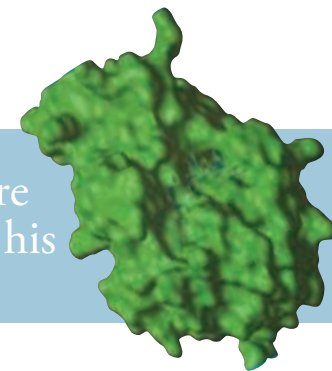


WHEN RESEARCHERS IN SHANGHAI SUCCESSFULLY DETERMINED THE STRUCTURE OF THE SEVERE ACUTE RESPIRATORY SYNDROME (SARS) PROTEIN, DR PUAH AND HIS TEAM DECIDED TO APPLY THEIR METHOD OF RESEARCH IN THE DENGUE PROJECT TO SARS.



Under the Microscope

We probed the mind of Dr Puah Chum Mok, Centre Director of Singapore Polytechnic's Centre for Biomedical and Life Sciences, for his thoughts on his chosen discipline, what it takes to be a researcher and life beyond the lab.



1. What inspired you to go into biochemistry and life sciences?

Years ago, I read an article on the cracking of the DNA codes in a library. Since then, I was totally fascinated and intrigued by the fact that genetic materials are made of chemical blocks and nothing else.

2. How long have you been in this discipline? Did you ever think of switching fields?

It's been too long to remember! Although many of my colleagues have switched fields into sectors that are more financially lucrative, I firmly believe in what I am doing, because the type of work we are doing can make a difference in improving our general healthcare and education.

3. If not academia and research, which profession would you have gone into?

I nearly went into accountancy. It was just that the job offer from a hospital arrived through the post before the accounting firm.

4. What is the most satisfying moment for you in the course of your illustrious career?

I wouldn't dare to say that my career is illustrious or even glamorous. These terms rightfully belong to other professions and certainly do not apply to those of us labouring in the labs. The only buzz you get out of this is when you find something new in what you are doing and it is of commercial value.

5. You taught for some time before moving back into research. What was the greatest challenge you faced as a teacher?

I started off in endocrine research and moved into the bio-industry culturing HIV and other viruses before entering the teaching world. And now it is back to research. In the research arena, everyone is a student because you will be asking questions all the time. But our students tend to clam up. That will be the biggest problem if they want to get into research. In R&D, you must ask questions and ponder—very often, the right questions can trigger off useful insights and even provide the solutions to your problems.

6. What was the greatest challenge you faced in research?

To get people to talk more often about their work so that others may offer tips to solve their problems. The other problem is getting the right people or partner to work with you. Ultimately, we have to rely on each other's strengths to overcome the many problems we are facing. You can't work by yourself in isolation.

7. What does it take to be a successful researcher?

You must have a gut feel for the project even if it has only a 55% chance of succeeding. This means you must stick your neck out to take some risks. Other attributes such as perseverance, tenacity and having a 'thick skin' in facing up to many doubters will come in handy.

8. Describe your research philosophy or ethics.

Once we get the right people, we must let them work at their own pace. We should not look over their shoulders all the time or breathe down their necks at every setback. But that does not mean we do not have to account for the outcomes at the end of each project. Ultimately, it is taxpayers' monies that are financing the projects.

9. Singapore is positioning itself as a hub for the life sciences. In your opinion, what more can be done by the authorities to establish this?

What we are trying to do is to show that besides training the required manpower for the bio-industry, polytechnics can play a small role in conducting applied R&D research i.e. a small 'r' with big 'D'. Many of our projects are with the academia—while they concentrate on the upstream aspect, we work on the downstream. Typically, this is the stage where prototypes are developed and evaluated, and will be of interest to potential investors who want to commercialise them. Since our work generates Intellectual Property Rights, we have no choice but to file for patents. That inevitably involves filing costs. Furthermore, some form of support to help us in recruiting staff would be a tremendous help.

10. What is your life like outside the lab?

Tai chi is my other interest. I have been doing it for the last 17 years. It may appear to the uninitiated as nothing more than waving one's arms around. I myself was initially surprised by the amount of thinking one has to do to perfect tai chi moves. To me, it is more difficult to do tai chi than to do another ten PhDs. To overcome the mental blocks, one has to read old tai chi manuals, which are often written in an obfuscated language. The other books that I read many times to improve my tai chi and research are the Dao Te Jing and the Yi Jing. Incidentally, these ancient texts have attracted the attention of researchers working in areas of particle physics and those who want to know what the universe is made of.

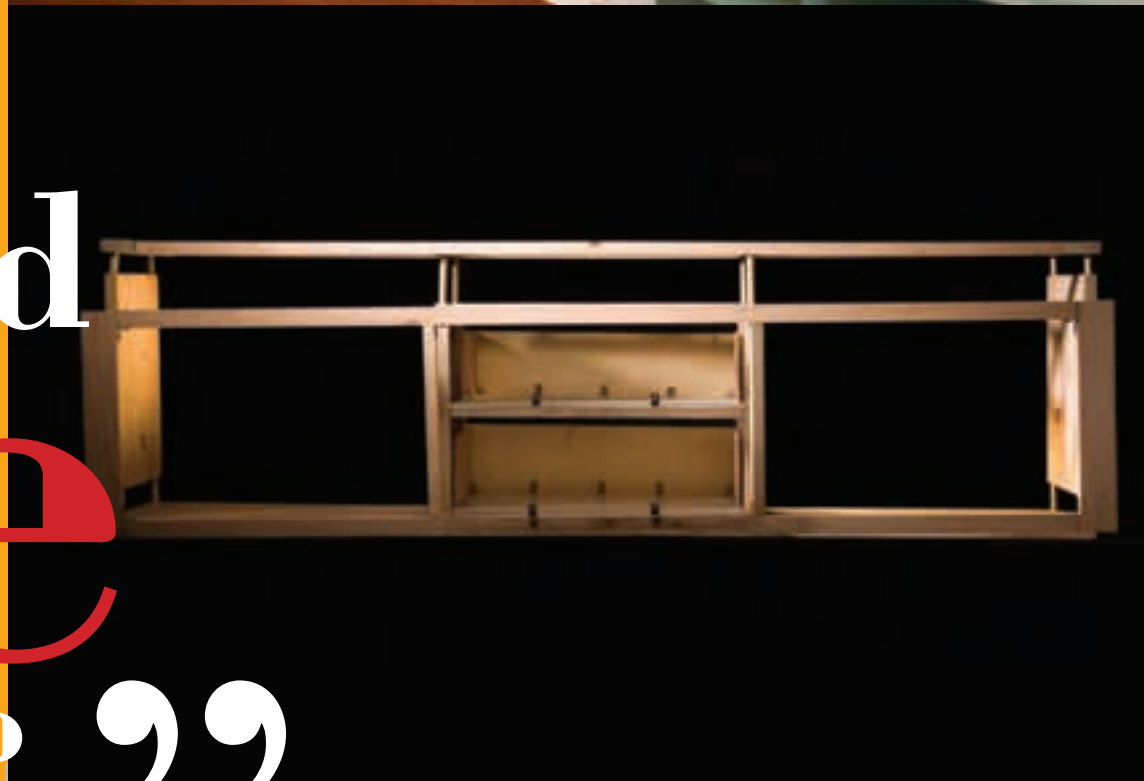
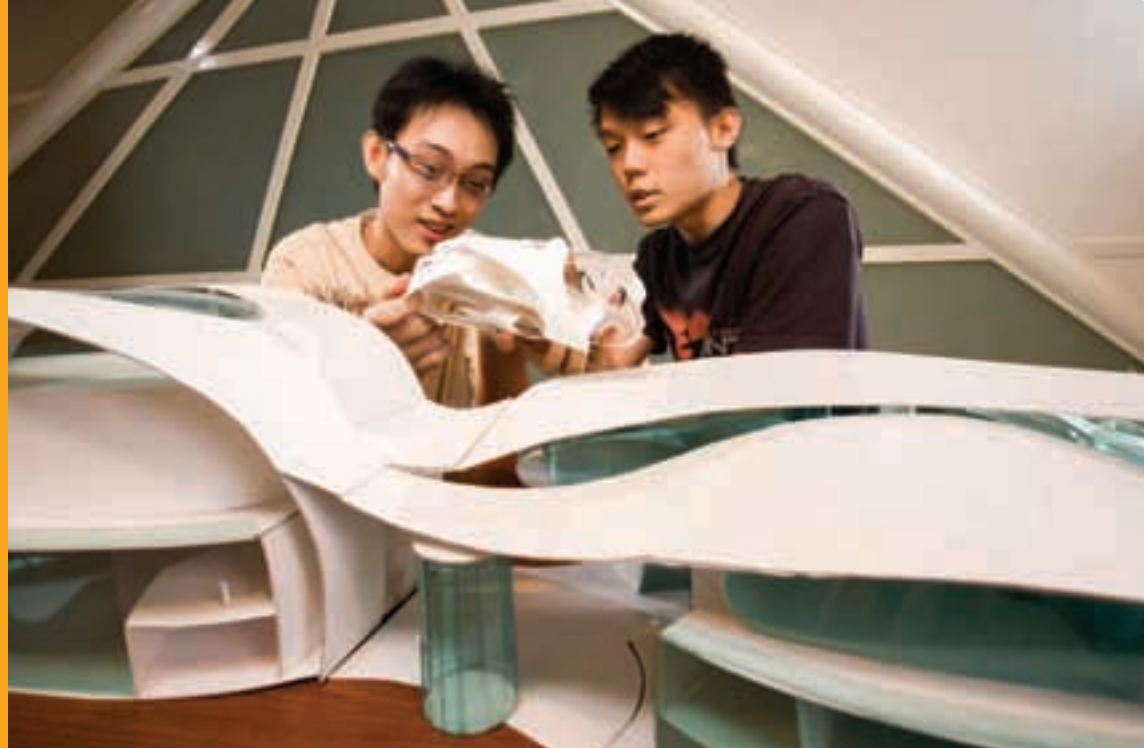
11. Who are the other members on your team for the dengue research?

Professor Zhu Weiliang was with us for six years and he was instrumental in getting the dengue project off the ground. Although he is back at the Shanghai Institute of Materia Medica as a principal investigator, we still collaborate on our dengue and SARS projects. Recently, Dr Chen Gang and Dr Zuo Zhili joined us to speed up our projects. Internally, Dr Liew Oi Wah helped us to clone the viral proteins. And Dr Cui Taian designed the anti-viral peptides.



“Pr
passio
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Progress
is achieved
by the
mate
who dare to “
change.





a brave new world of technology & innovation

A Brave New World of Technology. & Innovation



Progressive Hothouse, Incubators, R&D Hub, Catalyst, Creative Dynamos... whatever you call them, the Technology and Innovation Centres at Singapore Polytechnic are earning wide acclaim locally and globally. What's more, they have inspired students and staff to scale greater heights in creativity and innovation.

TECHNOLOGY AND INNOVATION CENTRES: A MOTHER LODE OF CREATIVE IDEAS

A fertile ground for future technology, products and processes, the Technology and Innovation Centres (TICs) in Singapore Polytechnic (SP) are where knowledge creators and ideas generators come together with compelling effect.

These multi-disciplinary centres provide research facilities for students to explore their potential, and staff to keep abreast of the latest developments in the industry. In turn, they enhance the quality of teaching in SP and streamline the transfer of technology to and from the industry.

Highly attuned to the latest industry trends, expertise at the TICs revolves around the following areas:

- Biomedical and Life Sciences
- Environmental Applications
- Experience Design
- Food and Beverage
- Interactive and Digital Media

Besides offering an excellent platform for staff and students to engage in high-tech research, the TICs are also launch pads for major industrial collaborations and cutting-edge R&D projects.



R&D FOR COMMUNITY

Committed to transferring the advantages of R&D to the community, the TICs place an emphasis on commercial results for public benefits.

The TICs regularly engage external partners and the community in its research—to achieve mutually beneficial outcomes. Staff at the TICs are also actively involved in developing a range of joint projects with private organisations and companies.

On the other hand, TICs like the Centre for Applications in Environmental Technology, and Food Innovation and Resource Centre work closely with government agencies to develop innovative products. These agencies include SPRING Singapore, PUB and EDB.

TO INFINITY AND BEYOND

For the future, SP aims to build new TICs in the following areas:

- Bioengineering
- Business Innovations
- Creative Teaching
- Manufacturing Technology
- Maritime Transportation
- Nanotechnology

With their sights set on technology development and a sharp focus on future innovations, TICs in SP would provide the essential support to benefit the economic development of Singapore in years to come.

CENTRE FOR APPLICATIONS IN ENVIRONMENTAL TECHNOLOGY (CAET)

The CAET aims to lead the development of application in environmental technology. The centre works closely with national agencies, enterprises, and institutions to carry out R&D in this area. Such partnerships serve to be beneficial for Singapore as a whole.

Mission

To support local R&D and innovation in the environment and water industry.

R&D Focus

- Clean water management
- Clean air management
- Noise management
- Solid waste management
- Sensing Technology
- Waste reduction, recycling and reuse
- Nature/resource conservation
- Green and clean technologies

Innovation Highlights

- Creative use of composite wood
- Waste water quality monitoring system
- Waste Concrete Reclamation
- Sustainable & Clean Energy
- Air Pollution & Control Measures

Contact

Centre for Applications in Environmental Technology
W1011L

T: +65 6870 4857 F: +65 6870 7048

CENTRE FOR BIOMEDICAL AND LIFE SCIENCES (CBLS)

At the forefront of living organism studies, the CBLS is fully equipped with state-of-the-art laboratory facilities. With the ability to adapt to rapid changes in the industry, the CBLS supports SP's excellent training on high-tech development in life sciences. The centre also aims to spur students' creative exploration in this field.

Mission

To develop a vibrant applied R&D culture and support technology development in life sciences.

R&D Focus

- Bioengineering
- Bimolecular modelling
- Transgenic plants
- Bioprocess engineering
- Drug design and screening

Innovation Highlights

- Optical sensing for detection of plant nutrients and water stress
- Identification of 14 compounds to prevent the dengue virus from replicating
- Anti-SARS compound

Contact

Centre for Biomedical and Life Sciences
T11A Level 4
T: +65 6772 1896 F: +65 6870 8004

CENTRE FOR EXPERIENCE DESIGN (CXD)

The latest research facility in SP, the CXD conducts Applied Research and Innovation (ARI) in Experience Design. Experience Design is the convergence of Design, Innovation, Technology and Business to create a sustainable competitive advantage that is vital in the global product value chain. The centre also runs the IDEA (Innovation, Design & Enterprise in Action) module, a subject that builds creative capital and nurtures a culture of creativity, innovation and enterprise among the staff and students.

Mission

To create original, unique, memorable and transformative experiences of products, services and brands as premium economic offerings.

R&D Focus

- Customer experience design
- Experience interface design
- Sensory Branding

Contact

Centre for Experience Design
T11A 203
T: +65 6870 7971 F: +65 6870 7051

FOOD INNOVATION AND RESOURCE CENTRE (FIRC)

The FIRC is a joint initiative by SPRING Singapore and Singapore Polytechnic. The centre, being the first centre of innovation to be launched under SPRING, will help food enterprises to develop new and innovative products, processes and packaging.

Mission

To be a one-stop technology and resource centre for food enterprises.

Services

- Consultancy Services in Technology Development
- Training Courses, Seminars & Workshops
- Innovation Resource & Advisory Support
- Equipment & Test Kitchen for hire

Innovation Highlights

- Formulation of twin-ply noodles, functional inulin-infused chocolates, reduced sugar 'XO' kaya.
- Processing and packaging of microwaveable, "ready-to-eat" frozen meals such as Hainanese chicken rice, Laksa, and "Dry" Mee Pok.

Contact

Food Innovation and Resource Centre
W214
T: +65 6870 0634 F: +65 6870 8024

INTERACTIVE AND DIGITAL MEDIA CENTRE (IDMC)

The IDMC was established in line with national efforts to promote R&D in Interactive and Digital Media (IDM), and advance the growth of the IDM industry in Singapore. The centre adopts a cross-disciplinary approach by bringing together the domains of interactive and digital media, information communications, engineering, business, music, architecture, and design.

Mission

To support Singapore's R&D and innovation in the Interactive and Digital Media Industry.

R&D Focus

- IDM in education
- Human-Computer Interactive (HCI) for music and the arts
- Computer games and digital entertainment technology
- Digital graphic and effects
- Immersive environments and metaverse (virtual reality)

Innovation Highlights

- Digital Media Gridzone (DMG)
The DMG is a cost effective rendering farm assembled using commodity PC hardware and software. It accelerates the process of rendering complex digital scenes by parallel process.

Contact

Interactive and Digital Media Centre
T2042
T: +65 6870 4735 F: +65 6779 7912



it's a deal

Singapore Polytechnic has made a name for itself, not only within the educational arena, but in the commercial world as well. Here we take a look at some of the students' efforts that have made it to the big time.

1 Quest for Healthy Kaya

Fong Yit Kaya engages Singapore Polytechnic students to develop a healthier breakfast option.

Fong Yit Kaya enlisted Singapore Polytechnic on a mission that would revolutionise breakfast forever: to create a healthy version of *kaya*, the traditional coconut and egg spread. Goh Tee We, Production Manager at Fong Yit Kaya, said the reason he chose to partner SP was because of its expertise in R&D.

In 2006, Singapore Polytechnic was proud to say "Mission accomplished!" to the leading *kaya* manufacturer.

Final-year students from the Diploma in Chemical Process Technology, Food Technology option, had created an authentic *kaya* with about 25% less sugar, fat and cholesterol and yet retains the familiar rich taste. It was awarded the Healthier Choice label by the Singapore Health Promotion Board.

The great tasting, smooth-textured and healthier version of *kaya* is now available on supermarket shelves.



2

Authentic Local Meals at the Push of a Button

Partnering Singapore Food Delight Manufacturer to create a range of frozen ready-to-eat meals.

Singapore Polytechnic and Singapore Food Delight Manufacturer wanted to make favourite dishes conveniently available to all busy households.

In the end, SP managed to package seven local favourites into state-of-the-art packages that do not even require puncturing during microwaving. These seven were Soya Sauce Chicken Rice, Curry Chicken Rice, Hainanese Chicken Rice, Chilli Crab, Pepper Crab, Laksa and Mee Pok Dry.

Unlike usual frozen foods, the innovative packaging does not require consumers to puncture or peel off the clear film before heating in a microwave. Instead, the vacuum-skin film “balloons up”, trapping moisture and flavour as it is heated, and then self vents and relaxes over the food.

SP provided expertise in the formulation, processing and packaging of the products.

3

Rice that’s a Runaway Success

Gan Hup Lee to market special flavoured savoury rice across Asia and Europe.

During their internship with local rice supplier Gan Hup Lee, two Singapore Polytechnic students concocted a creation that made it possible for busy individuals to whip up some of their favourite dishes in under 20 minutes.

The students developed special flavoured savoury rice premixed with natural flavours and other ingredients to create Dish Out Ready-to-Cook Chicken Rice, Nasi Lemak, Mixed Brown Rice with Garlic and Yam, and Mixed Brown Rice with Anchovies.

Gan Hup Lee plans to export Yamie Rice across Asia and Europe, where it sees a huge potential market. Meanwhile, the two Singapore Polytechnic students are already working on a low-fat, calcium-fortified version of Yamie Rice to cater to the health-conscious.

4

Using Their Noodles

Kwong Seng International manufactures revolutionary two-taste noodles.

As part of their final-year project, three Singapore Polytechnic students created a range of unusual two-ply noodles with two flavours that have been snapped up by Singapore’s leading noodle manufacturer, Kwong Seng International.

The unique noodles are made from a combination of Spinach/Paprika, Soy/Pumpkin and Sesame/Pandan—all ingredients starting with the letters “S” and “P”. The noodles do not contain any artificial flavouring or preservatives and have received halal certification from Majlis Ugama Islam Singapura. The noodles are a part of the Premium Food Gifts of Singapore and are sold at Changi Airport Terminal 1. It has also won the Singapore Institute of Food Science and Technology’s Innovation Award 2005-2007.

5

Getting Saucy in Singapore

Local student-developed condiment gives foreign salad dressings a run for their money.

Everyone's heard of Thousand Island, French and Italian salad dressings. But one would be hard pressed to find a truly Asian or Singaporean condiment in the supermarkets. However, with the efforts of Singapore Polytechnic, RevoPack and Fountainhead Manufacturing, the Singapore Salad Sauce has become a reality.

Combining spices found in the region, the halal-certified sauce was fine-tuned for five months by a trio of Food Technology graduates from the polytechnic's School of Chemical and Life Sciences. Available in both Spicy and Fusion flavours, the sauce is suitable as a salad dressing, marinade, for barbeques, stir-fries and even spaghetti.

For a start, the Singapore Salad Sauce was available at Vantage Gourmet's Singapore Premium Food Gift Boutique Café at Changi Airport from July 2007 and subsequently in Cold Storage Supermarkets.

With a shelf-life of at least one year without refrigeration, the sauce is set to spice up the menus of tourists and Singaporeans.

6

Sweet Twist to Spice up Your Romance

Singaporeans express their love with chocolate- and cheese-filled curry puffs!

This novelty item, which looks like a traditional curry puff complete with a crispy exterior, was sold by 1A Crispy Puffs at its 10 outlets across the island. The puffs were packed in specially designed gift boxes for the romantic touch.

This Valentine's Day recipe was whipped up by three former Singapore Polytechnic students.

Ms Tracy Ow, 24, Project Manager of 1A Crispy Puffs, which is owned by her family, sampled and fell in love with the recipe during Singapore Polytechnic's Spinovex Exhibition. This exhibition showcases the projects of final year students.

"Puffs are generally shared with family and friends. We have just added love and passion into every bite. So instead of buying a box of chocolates, you can buy a box of Valentine's Day puffs for your dear ones. The best way to eat these novelty puffs is to bite into them," says Tracy, "letting the chocolate and cheese ooze out and melt in your mouth."

7

Lap Cheong Gets Healthy Boost with Lower Fat and Sodium Content

Lovers of Chinese sausages, or *lap cheong*, can now savour this delight without worrying about clogged arteries.

Singapore Polytechnic students have developed a *lap cheong* with lower fat and salt content. Their creation even meets the nutritional guidelines of the Healthier Choice Label Programme administered by the Health Promotion Board!

Golden Glory Food Industries, which has been producing sausages for 30 years, signed a two-year agreement with Singapore Polytechnic to manufacture and market these healthier sausages, under the brand name Twinz Sausage D'lite.

The company has approached supermarket chains to market Twinz Sausage D'lite within Singapore. It is also eyeing the Malaysian and Australian markets.

9



10

8

Local Chocolate Entrepreneur Wants a Bite of Global Halal Market

Muslims here and abroad have a new line of high-end chocolates to savour.

Cacao Gourmet & Premiums is embarking on a new venture to manufacture and market inulin-infused chocolates developed by Singapore Polytechnic. Inulin is a plant fibre that helps promote the growth of good bacteria in the intestines and improve digestion. With this product, not only can Muslim consumers enjoy the pleasures of chocolate, but they can also benefit from its healthy goodness at the same time.

The company has received halal certification from Majlis Ugama Islam Singapura (MUIS) for this inulin-infused chocolate line. The chocolates' main ingredients include fruit puree and inulin, making them suitable for Muslims to consume.

Cacao Gourmet & Premiums is distributing the chocolates through gourmet chocolate boutiques here, before moving to tap the vast affluent Muslim consumer markets in the region, the Middle-East and beyond.

9

Another Winning Collaboration with Industry

Board games are child's play for these SP students.

Singapore Polytechnic's School of Media and Info-Communications Technology signed a Memorandum of Cooperation with local company Alpha-Plus Training in 2006. The aim was to develop and commercialise board games that would address the needs of the corporate world. It started with a student-developed game called Manage, Manage, Manage.

Students came up with another innovative board game, which was further evolved and fine-tuned by Alpha-Plus Training and named ProjEX.

This integrated learning experience draws on the latest cutting-edge brain research and calls for effective teamwork. It highlights the value of different roles and motivations to complete a project on time, within budget and with quality.

Alpha-Plus Training has bought over the remaining rights to the game to be able to sell it commercially.

10

Cosmetical Asia Markets Perfumes Created by SP

Romance Singapore sees brisk sales.

When nine students from Singapore Polytechnic's School of Chemical and Life Sciences created two perfumes for a national campaign called Romance Singapore 2004, they set a milestone in the local fragrance industry.

The two perfumes are the first Singaporean perfumes created by students to be commercialised.

The students experimented with a hundred different types of scents before discovering the perfect two perfumes. The result is a sensual mix of freshly picked flowers for the ladies and a musky, seductive blend for the men.

In 2004, Cosmetical Asia signed an agreement with SP to launch the Romance Singapore perfumes. To date about 6,000 bottles of the perfumes have been sold.

The success of the perfumes led to the signing of another agreement with Cosmetical Asia/StarAsia in March 2007 to manufacture and sell a new series of perfumes for males and females.

Innovation

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n

RIOTS

5



purple is the new gold





Purple is the NEW GOLD



Need proof that R&D is not just an esoteric process that's confined to the lab? The discovery of purple gold shows that it can literally be turned to gold.

GOLD—GLITTERING, PRECIOUS GOLD

No other substance has quite captured the human imagination and engendered fascination as much as gold. Throughout the ages, it has caused the madness of gold rushes, held steadfast in value through world turmoil, adorned the powerful and inspired millions.

The glamour and mystery of gold has inspired the best scientists and alchemists to try their hand at making it. It's an irresistible possibility that could transform anyone into a King Midas—the idea that, through hours in the lab, you could find a secret formula to create the world's most highly coveted and enduring form of wealth.

Now combine that allure with the colour purple—a mystical colour of individuality and, in the West, of royalty—and you will see the appeal of purple gold for Mr Loh Peng Chum. He perfected a process to produce malleable and stable purple gold while he was a lecturer in the School of Mechanical and Manufacturing Engineering at Singapore Polytechnic.



Mr Loh Peng Chum



Mr Loh Peng Chum perfecting the technique to make malleable, stable purple gold in the laboratory.

“IT TOOK ME THREE YEARS OF EXPERIMENTING TO IMPROVE THE PROCESS SO THAT THE YIELD REACHED 80 PER CENT INSTEAD OF THE INITIAL 20. BUT WHAT KEPT ME GOING WAS THE DESIRE TO MAKE MY IDEA HAPPEN.”

– Mr Loh



TURNING PURPLE

Mr Loh’s journey towards purple gold began in 1976, when his lecturer at the University of Wisconsin challenged him to find a way to stabilise purple gold. It was only some 24 years later, in 2000, that he finally managed to create the world’s first 19-carat lilac-coloured gold.

“At that time, purple gold had already been around for at least 20 years,” he recalled. “But a way to produce it in a pure, untarnished form that was malleable enough to turn into jewellery hadn’t yet been found.”

The alloy of gold and aluminium was brittle, porous and reacted too readily, even to oxygen in the air, leading to blotches and uneven colouration.

It took Mr Loh two years of dedicated work and sacrifices—19-hour work days, weekends, and the occasional accident in the lab—to develop a method that turned out a malleable, stable purple gold.

“My technique involves heating the mixture of gold and aluminium to 10,000 degrees Celsius, then passing an electrical current through the molten alloy,” he explained. Naturally, the work hazards were very real—10,000 degrees Celsius is hotter than the surface of the sun. Mr Loh even recalled an incident when a chemical exploded and his torso and shoulder were severely scalded.

And even after the gold had been developed, the work wasn’t over. “After Aspial Corporation Limited bought the marketing rights to purple gold in 2000, I had to work with them to find ways to make the metal more commercially viable,” he said.

It’s a process that he remembered as being even more challenging than the first two years, “It took three years of experimenting to improve the process so that the yield reached 80 per cent instead of the initial 20. But what kept me going was the desire to make my idea happen.”





GOLD RUSH!

For jeweller Aspial Coporation Limited, the discovery was literally like striking gold. “We decided to buy the rights because we recognised the potential of purple gold and the positive impact it would have on our brand names and profit,” explained Mr Kean Ng, Senior Marketing Manager of Lee Hwa Jewellery.

“It was an industry breakthrough since we’ve always had white gold, yellow gold and rose gold. Purple was a very different and unique colour.”

Consumers were quick to catch on to the uniqueness of Aspial’s purple gold range. “Purple gold was a major hit when it was first launched in Singapore—consumers loved it,” recalled Mr Ng.

“Its appeal is definitely its uniqueness—most people were surprised to know that purple gold actually existed. It’s always a conversation starter, especially if you tell people who’ve never seen or heard about it before.”

Apart from the overwhelming market response, Mr Loh’s invention also helped to put Singapore on the map, and ushered Aspial onto the international market scene. “We’ve had many international enquiries regarding our purple gold and we’ve also exported some limited pieces to exclusive overseas jewellers,” said Mr Ng.

For Mr Loh, who has since retired from Singapore Polytechnic after 32 years with the institution, the work goes on too. It’s pushing the boundaries of the precious metal that Mr Loh is most passionate about—and his passion for the metal shows no sign of waning. When asked why, he laughed and said it could be because his name means “three gold” in Cantonese. “My father chose it for me as my Chinese elemental analysis found I was lacking in gold.”

“MY TECHNIQUE INVOLVES HEATING
THE MIXTURE OF GOLD AND
ALUMINIUM TO 10,000 DEGREES CELSIUS,
THEN PASSING AN ELECTRICAL CURRENT
THROUGH THE MOLTEN ALLOY.”

– Mr Loh



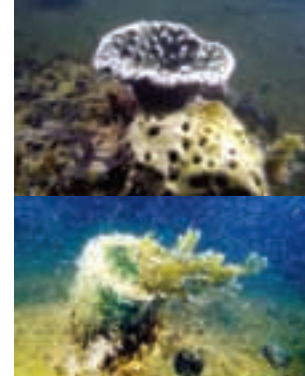
seas get breath of new life



A day in the life of a marine conservationist: Braving the elements.

“YOU’RE CREATING
SOMETHING OUT OF
NOTHING TO RESTORE THE
ENVIRONMENT”

– Captain Francis



Seas Get Breath of **NEW LIFE**

Using simple materials to create artificial reefs, a team of marine enthusiasts show that restoring Singapore’s dwindling corals is good not only for the sea, but for the soul as well.

It started as an idea in marine conservation. A Seacil is, admittedly, a rather innocuous-looking structure. It consists of a wire frame with mesh screens, supported on PVC pipes. A mixture of cement, sand and seawater is poured into bags when the Seacil is underwater, to form a concrete edifice on which corals can grow. The humble appearance of a Seacil belies what it is built to accomplish: the regeneration of coral reefs where they have been largely destroyed or damaged.

After many frustrating years of trying to get it done, it was made a reality when commercial diver Charles Rowe teamed up with the Singapore Maritime Academy. There it became an R&D project that has gained recognition locally.

Lowered into relatively shallow waters—onto PVC pipes to prevent it from sinking into the mud—the Seacil’s mesh screen, made from fishing nets, filters out sediments that impede coral growth. Its concrete face is positioned at a 45° angle to the waves, to break the force of the current. Nature is thus given a slight leg up.

CORAL REEF DAMAGE—THE GRIM FACTS

Around the world, coral reefs have been battling for survival. A 2001 report by GESAMP warned that “coral reefs have been damaged in 93 of the 110 countries where they occur, and some 27% of the world’s reefs run a high risk of degradation.”

Locally, the National University of Singapore Reef Ecology Study Team noted that “since 1986, most coral reefs in Singapore have lost up to 65% of their live coral cover”.

THE RISE OF AN UNDERWATER WORLD

The team was upbeat about what they could achieve at Labrador Park, which is a protected heritage site.

“We’re lucky to have this place. NParks has sponsored the container where the team has set up a temporary site office. The Totalisator Board has given us \$145,000 of funding. I don’t perceive this project to be one hundred per cent, but I think there will be a level of success,” said Rowe.

For Captain Frederick Francis, the leader of the project, one of the most rewarding aspects of the project was “working with the students and creating in them an awareness of the marine environment.” He explained, “Often, they don’t know about all the wonderful corals you can find in Singapore...the students will be the future stakeholders, and we have to pass on the importance of sustainability.”

But this is just the beginning.

Captain Francis’ vision is to see a marine environmental centre built at Labrador Park, so they could give talks to the public and educate them.

He elaborated, “The technology used in the Seacil project can be used not only in Singapore but in other countries in the Asia Pacific as well. In the long run, this would help to establish Singapore’s status in marine conservation.”

“It’s a responsibility we have to the marine environment.”

The plan is for a series of these artificial reefs to be set up, complete with corals, clownfish, and a whole host of other aquatic life forms. As Captain Frederick Francis puts it, “We are not just creating Seacils, but an underwater garden.”



Coral reefs play a critical role in the marine environment. In a lecture on the Seacil project, Captain Francis described them as “the rainforests of the sea”, an apt description for some of the oldest and most complex ecosystems in the world.

Their significant socioeconomic function is highlighted in the GESAMP (the Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection) report: “Coral reefs have supported human populations on tropical coasts of the world for hundreds, if not thousands, of years.” Their great biological diversity makes them a storehouse of “organisms that are a source of chemicals with potentially high commercial value”.

Said Larry Chua, a student research assistant on the project team then, “According to the older folks, you could find corals around Pulau Hantu and even nicer ones here at Labrador about thirty years ago. Now, they are slowly being killed by sedimentation and marine movements.”

Coral theft, too, is putting Singapore’s myriad—there are about 200 species of hard corals found in our waters—coral populations at risk. This has led to the formation of groups like the Labrador Park Watch, whose members patrol the beaches to deter poachers.



But there is evidence that sometimes it is more profitable to work with nature than against it. Coral reefs are, after all, a major tourist attraction. Up to 1.6 million tourists descend upon the Great Barrier Reef each year to admire the sublime underwater seascape, generating in the process over \$1 billion in tourist revenue.

Little wonder, then, that Rowe envisioned the completed Seacil project at Labrador Park as an underwater garden attraction. Solar-powered underwater lights installed on the seacils serve not only an aesthetic purpose, but also attract marine life at night.

Marine conservation does not have to be at odds with economic development, nor does it have to involve extremely high costs or state-of-the-art materials.

Rowe pointed out, “We’re reusing elements of the sea, like saltwater and sand. All we’re adding is the gluing nature of cement to create something that is recyclable...you’re creating something out of nothing to restore the environment.”



The Seacil project is aimed at preserving coral lifeforms (pictured) that are found in Singaporean waters.



Fully loaded, and ready to save the underwater world.

“WE TAKE CORALS,
AND WE GRAFT THE
BASE OF THE CORALS
ONTO THE CONCRETE
EDIFICE. AND THERE
YOU HAVE IT—
NATURE, WITH ITS
OWN APTITUDE TO
CREATE LIFE.”

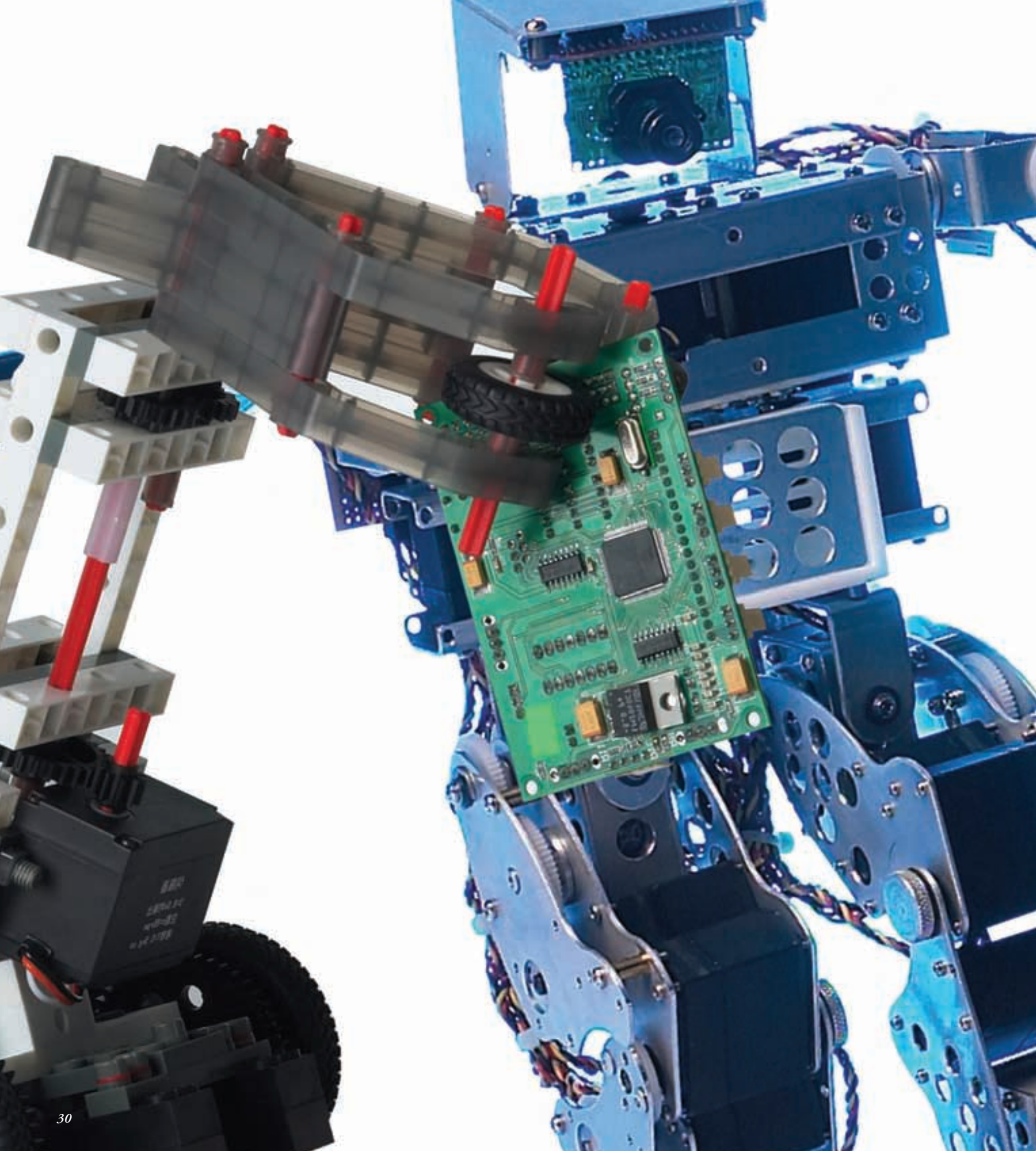
– Rowe

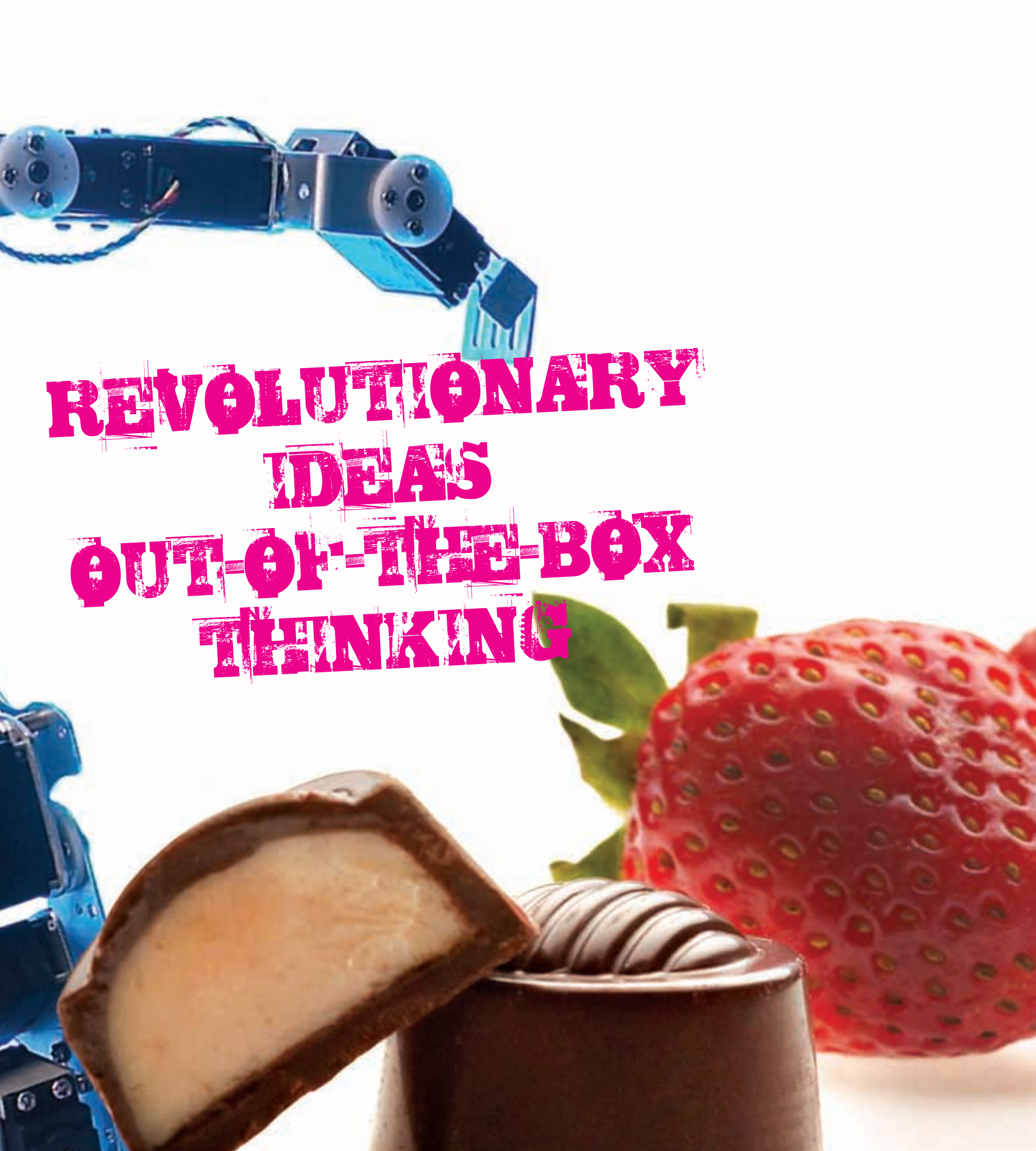
Captain Francis (middle) with members of his team.



Innocuous looking PVC
pipes are used as the pillars
on which a Seacil is built.







**REVOLUTIONARY
IDEAS
OUT-OF-THE-BOX
THINKING**

invasion of the mech warriors



Soccer Robots
having a field day.

It is a brave new world in robotics for Dr Zhou Changjiu and the rest of his team at Singapore Polytechnic's Advanced Robotics and Intelligent Control Centre.

Invasion of the MECH Warriors



It is a brave new world in robotics for Dr Zhou Changjiu and the rest of his team at Singapore Polytechnic's ARICC.

The striker approaches the ball, lines up, gets ready...the goalkeeper looks to be anticipating the corner after having been just a little too slow the last time...the striker pulls a kick...can the goalkeeper do it?

Nope, the ball glides right out of reach...Robo-Erectus scores!

In RoboCup 2005, held in Osaka, the Humanoid League one-upped the previous year's event by introducing a two-a-side game. This development was much welcomed by Dr Zhou Changjiu, chairman of the league and head of Singapore Polytechnic's Advanced Robotics and Intelligent Control Centre (ARICC). He enthused, "Soccer is a very interesting game. I believe that this is one of the best platforms to attract more students, as the students have a passion for it."

The ultimate goal though for the robotic soccer fraternity is to develop a team of fully autonomous humanoid robots capable of defeating the World Cup champions by the year 2050. But what is it about robotic science and soccer? The answer is simple: the game of soccer illustrates man's complex skills.

"A humanoid playing soccer involves many aspects of automation and control. There is the mechanical design, low-level electronic circuitry, the controls, the perception such as sensors and cameras, and then there is the human gait movement, its intelligence, how it avoids an obstacle or passes a ball. Soccer is a sophisticated challenge in the field of robotics," explained Mr Yue Pik Kong, one of the creators of the Robo-Erectus and a lecturer with the ARICC.

The efforts of final-year engineering students and dedicated staff certainly paid off. Since 2001, ARICC has been bringing home the coveted RoboCup and Federation of International Robot-soccer Association (FIRA) trophies. Add them all up and, in terms of the number of medals won to date, ARICC is probably the leading robotic institution when it comes to soccer-playing robots. That is definitely something to be said for a centre that was only set up in 1998 by the School of Electrical and Electronic Engineering.

But of course, doing well at competitions is not everything. ARICC embarked on its production drive in 2001 and, to date, has commercialised their Mirosot soccer robot—a wheeled robot in the shape of a cube that competes in a five- or 11-a-side match—as well as the Robo-Erectus. Clients include the Indian Institute of Technology, China's Zhejiang University and New Zealand's Massey University, to name just a few.

ROBOTICS AND THE FUTURE

On the international scene, the Japanese are gearing towards equipping its elderly with household support, the Europeans are developing advanced medical robots, and the Americans are looking into educational and military applications. So, what will Singapore be bringing to the table?

“Personally I think there are two directions we can take,” said Dr Zhou. “The first is for industry. We should develop robots to serve in the electronics or maybe transportation sectors.”

“The second direction, I certainly believe, is towards edutainment. Robots are very good for interaction with students and children. They will always have new ideas after playing. They learn to think by themselves, to work and collaborate as a team, and they will pick up the basics of mechanical design, software, and new technologies.”

Now that robots are conversant, can jog at a speed of 14 metres per minute (Sony’s Qrio), can outwit a master chess player and deny a striker from scoring a goal in soccer, who is to say what the future of artificial intelligence (AI) will be? We had to ask; after all, we have all seen Arnold Schwarzenegger as the Terminator.

“We should think of AI a little more positively. Because the technology is controlled by humans, we are the master. Although it is possible that scientists are able to programme a robot in such a way that it controls itself, robotics is really an integration of technology. Any one technology can see a robot computing faster than a human, but that will not be possible once we integrate everything together. So we are safe,” explained Dr Zhou patiently.



“A HUMANOID
PLAYING SOCCER
INVOLVES MANY
ASPECTS OF
AUTOMATION
AND CONTROL.”

– Dr Zhou

SPY BOTS AND ROBO TOYS

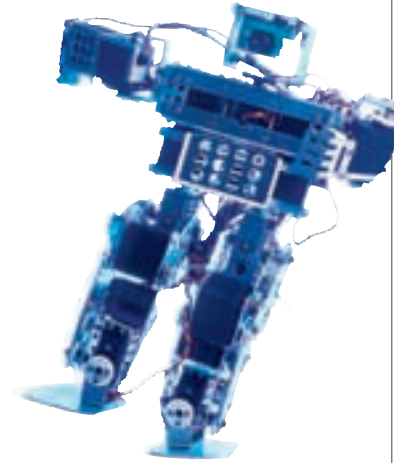
Apart from soccer and humanoid robots, ARICC’s research focus includes the development of autonomous robots (that can sense the environment and make decisions such as a spy robot), edutainment robots (like electronic pets and robotic kits such as Lego Mindstorms) and robotic toys.

The ARICC developed the Spy Robot. Suited for military reconnaissance missions and manoeuvring in hazardous environments, it is miniature in size, highly mobile, able to send video and data wirelessly and can be controlled by computer or PDA via a wireless network.

As for edutainment robots, the centre developed a robotic dog that can respond to voice commands and is operated through radio frequency remote control.

ARICC also collaborated with Hong Kong- and China-based firms to manufacture a low cost robotic toy targeted at primary and secondary school students.

“The aim of this project is to use robotics as a platform to motivate the young,” said Dr Zhou.



TECH TRIVIA

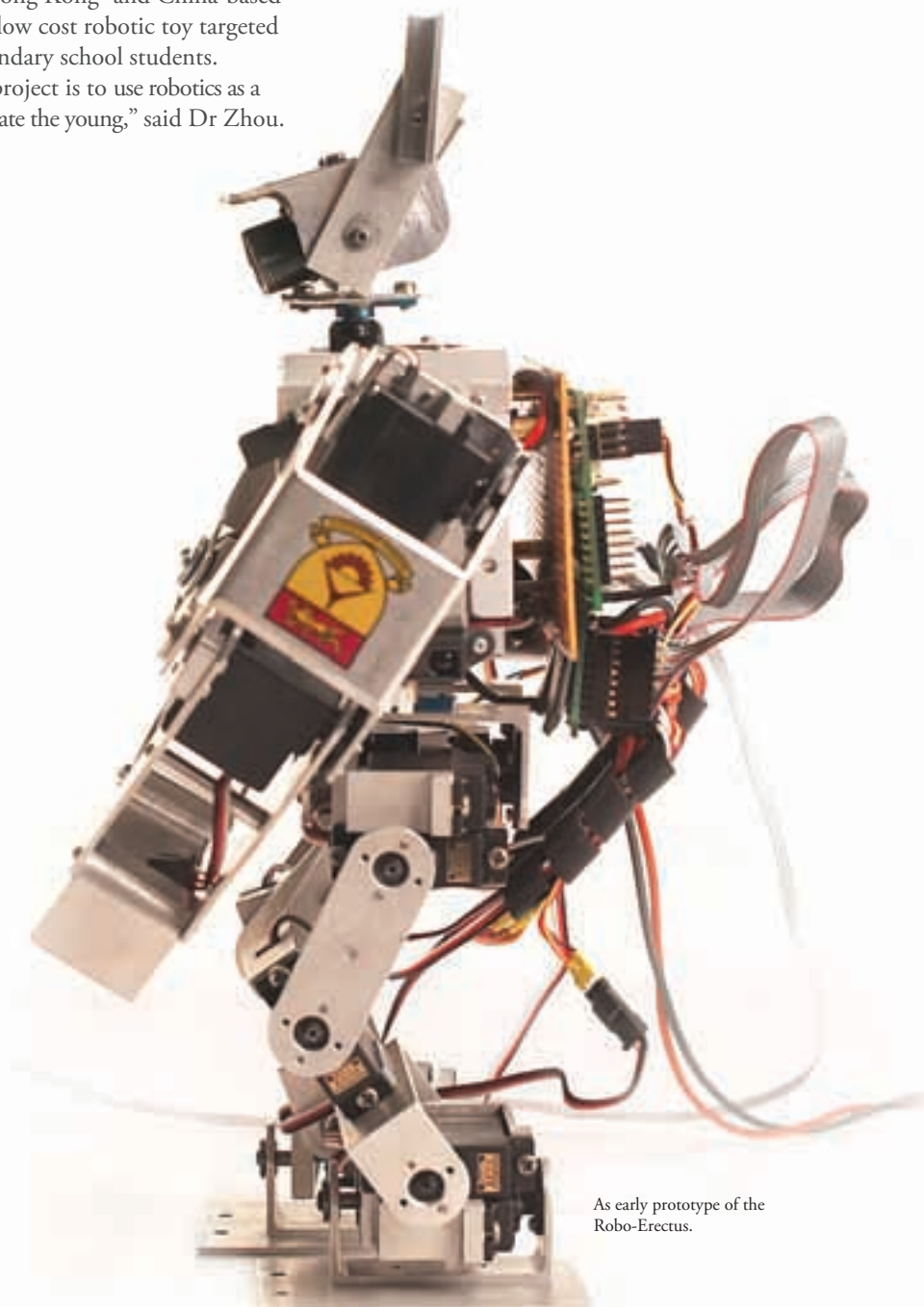
The frontrunners of the robotic industry are the Japanese.

Since 1986, Honda has been experimenting with a life-sized (1.2m tall) walking humanoid robot named Asimo. The new version of Asimo can understand human hand gestures and even moves its head to follow the speaker.

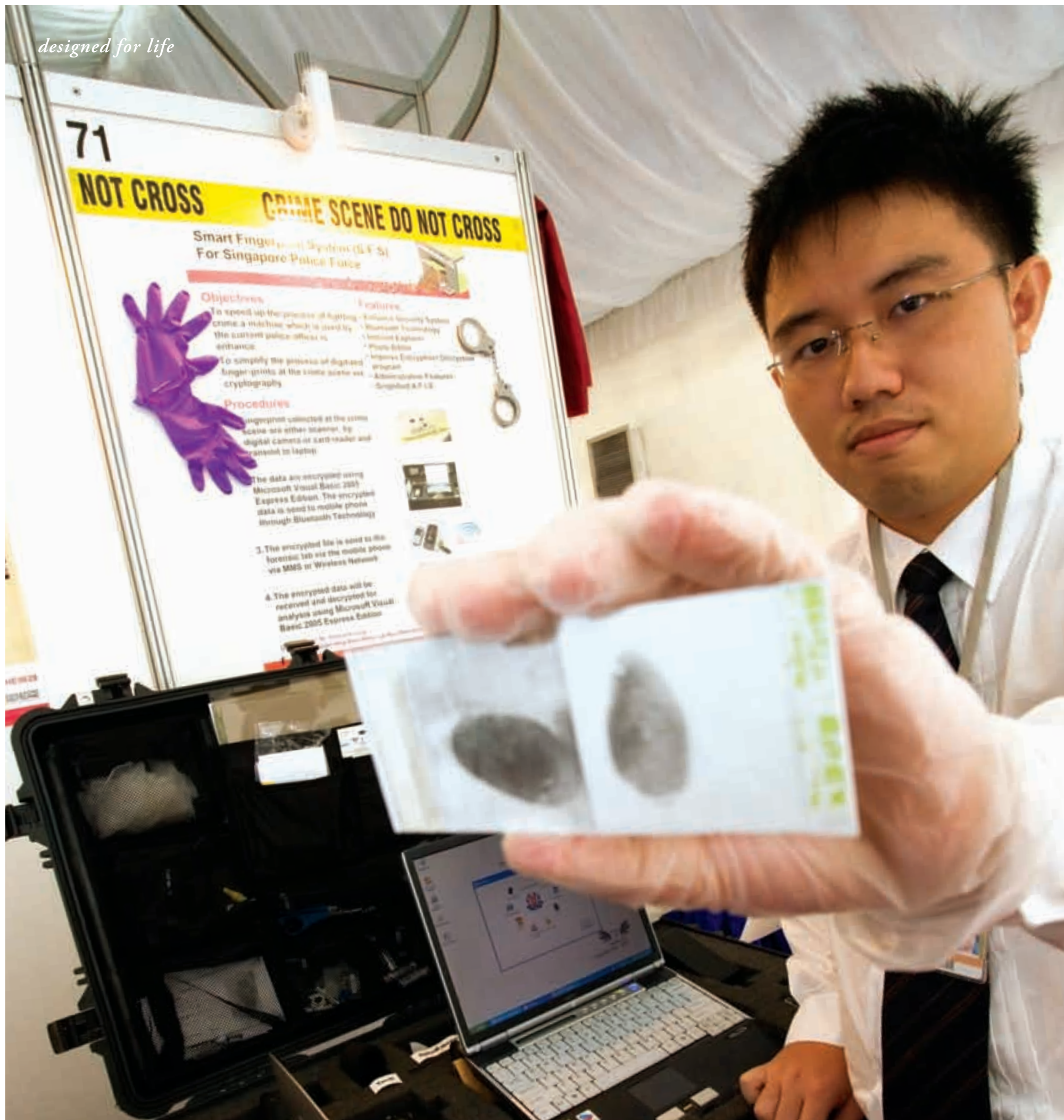
Then there is Sony’s 60cm tall Qrio, which is conversant in French and English, and has even conducted the Tokyo Philharmonic in a rendition of Beethoven’s Fifth Symphony.

In 2005, truckloads of autonomous household companions, android medics, and robot entertainers greeted visitors to the Prototype Robot Exhibition in Aichi, Japan. Toshiba, for one, unveiled ApriAlpha, a companion droid for the elderly that recognises its owner’s voice and responds with greetings and reminders.

Another home-based helper robot demonstrated was Miraikai’s WallWalker, a robot capable of sticking to windows and cleaning them autonomously.



As early prototype of the Robo-Erectus.



Designed for Life

1 | 7

Reinventing the Wheel

What is an innovative design? One that offers you avant-garde features? One that wows you with irresistible beauty? Or one that sets out to solve your problem in the first place? The latter may sound a tad boring. But for Singapore Polytechnic students, functionality and benefits are the keys to successful innovation.

Every slope is like Everest to the wheelchair bound.

To help them conquer the 'mountains', a team from the SP Centre for Rehabilitation Engineering (CARE) designed a motorised wheelchair that manoeuvres easily up a slope, and moves down in a controlled manner. It can even stop mid-slope!

The team used cheaper components to build the wheelchair—keeping prices low for the elderly and the needy. They even developed a cost-efficient cutting-edge power microcontroller for the wheelchair, reducing the controller size by almost half!

SP CARE's wheelchair provides several other benefits over conventional motorised wheelchair models. It is lightweight, easily foldable, and sports a special feature: ceasing powered rolling.

This feature automatically slows the wheelchair down to a very low speed when it is rolling down a slope. With optimal functional control at a low cost, the SP CARE wheelchair is definitely good news for our needy fellow citizens.



2 | 7

Instant Reading, Instant Response

Question: If a patient's temperature is rising and nobody is in the room to observe it, would anyone know?

Thanks to a prototype invention by Singapore Polytechnic, the answer is YES!

SP students have invented an intelligent warning system that can relay data information on vital signs to the doctor's Personal Digital Assistant (PDA) via the Internet.

This would allow doctors to review patients' vital signs remotely from anywhere in the hospital or even from home. Nurses could also monitor their situation from the hospital's central station.

An alarm will trigger to alert the staff if a patient's vital signs are abnormal or when the monitoring machine disconnects from the patient.

With this device, doctors and nurses would always be able to keep track of their patients' condition and respond in an instant.



3 | 7

Artificial yet Intelligent

Imagine the future, where robots participate in dangerous search and rescue missions in place of humans...

Well, the future is today!

Students from SP lent their technical expertise to companies from China and Hong Kong to develop a highly interactive robot.

The objective of this project was to create a robot capable of coordinating their movements to the requirements and expectations of their human counterparts.

The final product was able to interact with the users in various ways. For example, the disabled can control the robot using their eyeball! Remarkably, search and rescue mission teams can even control the robot remotely via wireless LAN!

The robots so impressed the National University of Singapore that they purchased them for their own research purposes.



4 | 7

Dengue Defence goes to the Gutter

You have covered the bamboo holders, checked the drains, pot trays, and even holes in the trees for stagnant water. Now, have you looked at the roof gutter?

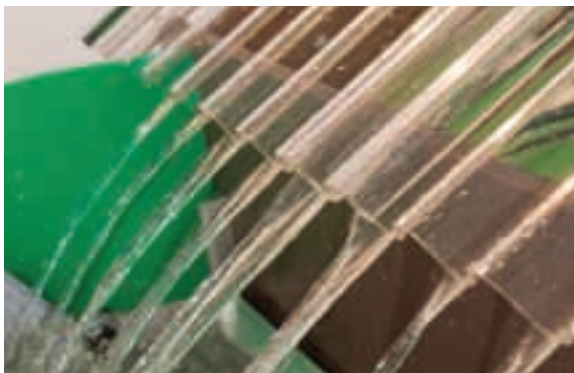
While Singaporeans are active in preventive measures to eliminate stagnant water from their homes, there are spots they might miss—like the roof gutter.

Roof gutters get blocked easily and trap water, creating the perfect breeding ground for mosquitoes.

To counter this, SP students designed and fabricated the Mosquito-Free Roof Gutter.

It tilts to one side along its length during dry weather and returns to an upright position when it rains. This prevents water collection and effectively frees the gutter from becoming a mosquito breeding ground. This innovation is also easy to maintain!

With this device, we can now sleep easier knowing that dengue will not go through the roof.



5 | 7

Giving Police Officers a Hand

SP students have come up with a way to help the forensic police in the turnaround time needed to identify a suspect.

With the Smart Fingerprint System (SFS), police officers can now streamline the process of sending fingerprints collected at the crime scene.

Instead of physically going back to the Forensic Department to access the database, they can now transmit or send by digital means via mobile phone through Bluetooth Technology or Wireless Network.

This process of digitising fingerprints at the crime scene has shortened the time needed to identify suspects and increase the chances of apprehending them.

With less time needed to transport evidence, criminals might just be caught almost red-handed.



6 | 7

He ain't Heavy, He's our Patient

It has been a long shift; you have not taken a break, not even for water; patients are all calling for you, one thrice your weight needs help to get from his bed to the wheelchair, and there is no one else to assist you...

Feeling tired and breathless? Welcome to career nursing.

If you *are* a nurse, this is a piece of good news: SP students have designed and built a new device to help you lift and transfer patients between platforms effortlessly.

Dubbed Passive Human Support, the device reduces the effort and energy used to lift patients by almost 70%! In addition, wheeling the lightweight device from point to point is a breeze.

With such a handy device, transferring patients between platforms will not be a chore anymore.

Bed to wheelchair anyone?



7 | 7

Good Golly Miss Molly!

Chambermaids at the Copthorne Orchid Hotel Singapore may soon bid farewell to tired arms—all thanks to students from SP.

The students, in collaboration with Copthorne Orchid, developed the idea to design a motorised trolley for the chambermaids. Named MOLLY, it reduces the physical effort required to push a conventional trolley by 80%. It also provides a variety of movements for safe operation.

Best of all, MOLLY is able to carry loads weighing up to a backbreaking 120 kg at a travelling speed slightly faster than walking pace.

With an aging workforce in the hotel industry, the students hoped that MOLLY would be able to help the chambermaids continue working in their current profession until a later age.





“Gre
comes
mere thou

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not from

ght, but from

thinking
differently

and

doing.”

pure (& sinless!) indulgence

Pure (& Sinless!) indulgence

Here's good news:
we've taken some of the sin
out of the dark stuff.

“PEOPLE LOVE CHOCOLATES, SO WHY NOT ENHANCE ITS NUTRITIONAL VALUE, AND MAKE IT BENEFICIAL FOR HEALTH?”

– Mr Tan

Everyone Loves Chocolate

It’s the ultimate comfort food and the quintessential sinful treat. Yet traditionally, chocolate is considered the Big Bad Wolf of foods. It’s high in calories, and loaded with sugar and saturated fats.

Now an innovation has turned all common knowledge about chocolate on its head. We are talking chocolate pralines that, believe it or not, are good for digestion.

It was exactly the mass appeal of the dark, milky sweets that Charissa Low, Elvin Wee and Ang Kwok Chye, a trio of final-year students from Singapore Polytechnic’s School of Chemical and Life Sciences, wanted to harness, together with their project supervisor, senior lecturer Tan Soon Ann.

“People love chocolate, so why not enhance its nutritional value, and make it beneficial for health?” explained Tan simply. “Studies have found that dark chocolate contains lots of antioxidants, and helps to reduce bad cholesterol.”

Add inulin—the team’s special ingredient—to those inherent qualities, and what you get is a treat that not only tastes good, but also does a whole lot of good for your body.

It’s a particularly attractive solution in our fast food culture, where a majority of the people don’t get their daily recommended portion of dietary fibre. Some scientific studies suggest that the prebiotic lowers the production of toxins and carcinogens in the intestines, and may help stave off colon cancer. Studies have suggested a link between bad bacteria and the disease.

On top of that, inulin has an unexpected benefit for dieters and chocolate-lovers, what Tan calls its “self-limiting effect”. “Inulin makes you feel full, especially if combined with vegetable and fruit fibre.”

In fact, each inulin-infused praline contains about the same amount of inulin as a banana. So chances are you won’t wipe out a box at a time as people normally feel full after eating just five or six—enough to keep good bacteria going for a week or so.

And six out of the nine pralines in a box are dark chocolate, which is a healthier alternative to milk chocolate. “We found in a survey that about 75 per cent of Singaporeans prefer milk chocolate, so we had to include some,” laughed Tan. “But the consolation is that our pralines have fewer calories than normal chocolates, as the inulin replaces some of the fat.”



INULIN? WHAT’S THAT?

Most people have never heard of inulin—a dietary fibre that occurs naturally in garlic, asparagus and bananas—let alone of its health benefits.

Inulin helps fight bowel problems like diarrhoea by promoting the growth of good bacteria, while suppressing the growth of bad bacteria. Good bacteria in your large intestine, like lactobacillus and bifido bacteria, feed on the inulin, breaking it down into short-chain fatty acids, which in turn suppress the growth of bad bacteria.



pure (& sinless!) indulgence



Tan Soon Ann
with students.

CHARGING AT THE CHOCOLATE FACTORY

While it seems a simple enough idea to infuse everyone's favourite food with a prebiotic that'll do them good, the initial going was, literally, gritty.

"This was the second attempt at infusing chocolates with inulin," mused Tan, who has 10 years of background knowledge in chocolates, having organised chocolate workshops and competitions. "The previous group that took up this project managed to mix inulin in powder form directly into the chocolate mixture, but chocolate lovers felt that that gave it a gritty texture."

The second group of 19-year-olds got around that by dissolving the inulin powder, derived from chicory roots, in water to create a gel, and added this to the fruit puree fillings of the chocolate instead.

The praline filling, consisting of the inulin gel, fruit puree and white chocolate, had to be cooked and pasteurised, then poured into a chocolate cavity and cooled, before it's covered with a milk or dark chocolate shell.

And as if the process wasn't complicated enough, the group first had to find a way to dissolve, then emulsify the inulin, and then experiment with varying proportions until they found the optimum percentage of inulin that would give the best results.

"The initial intention was to put as much inulin as possible into the chocolates," said Tan.

"But the mixture became very viscous and hard to handle. So we had to experiment repeatedly until we found a balance between incorporating as much inulin as possible, and keeping the chocolate palatable and easy to handle."

The group also spent six months on research and tests to stabilise the product's pH value, water activity, viscosity and shelf life.

“VALUE-ADDED PRODUCTS LIKE THESE INULIN CHOCOLATES ARE EXACTLY WHAT OUR CULTURE NEEDS—THEY’RE A QUICK HEALTH FIX, AND THEY TASTE GOOD TO BOOT. WHAT MORE COULD A CONSUMER WANT?”

– Ms Phua



EVEN BETTER THAN THE REAL THING

But the question on everyone’s lips was: how do they taste compared to regular chocolate? Even better, claimed the team.

“We conducted a blind taste test amongst our lecturers and students, and 60 per cent of them preferred the chocolates with inulin, because they found the sweetness just right. Inulin is actually almost tasteless, but for a very mild sweetness. If pressed, 95 per cent of people wouldn’t be able to tell the difference.”

Don’t just take their word for it. The chocolates are now available for purchase from Cacao Gourmet and Premiums, who took over from local company Ambrosia Cravings, which

commercialised the chocolates in September 2005. The pralines come in three flavours—passion fruit, mango and strawberry—at \$15 for a box of nine.

“The team worked closely with me, seeking feedback throughout the process. I was impressed at the thorough job they did, right down to researching how people normally store chocolates and extending the product’s shelf life accordingly,” recalled Ms Phua Mui Leng of Ambrosia Cravings then. “It made it easier to commercialise.”



A little flavour to inulin chocolate.

and the awards go to...

And the Awards go to...



A WINNING RE-INTERPRETATION OF URBAN VILLAGE

ARCHinteractive is staggered in both form and space to facilitate constant visual connections and interactions. Sounds impossible? Not with ARCHinteractive, the brainchild of Jonathan Lim Yu.

Jonathan, who graduated from SP with a Diploma in Architecture with Merit in 2007, clinched the First Prize in the prestigious 2007 Bentley Systems CADD International Competition with ARCHinteractive, under the University/Collegiate Architecture category.

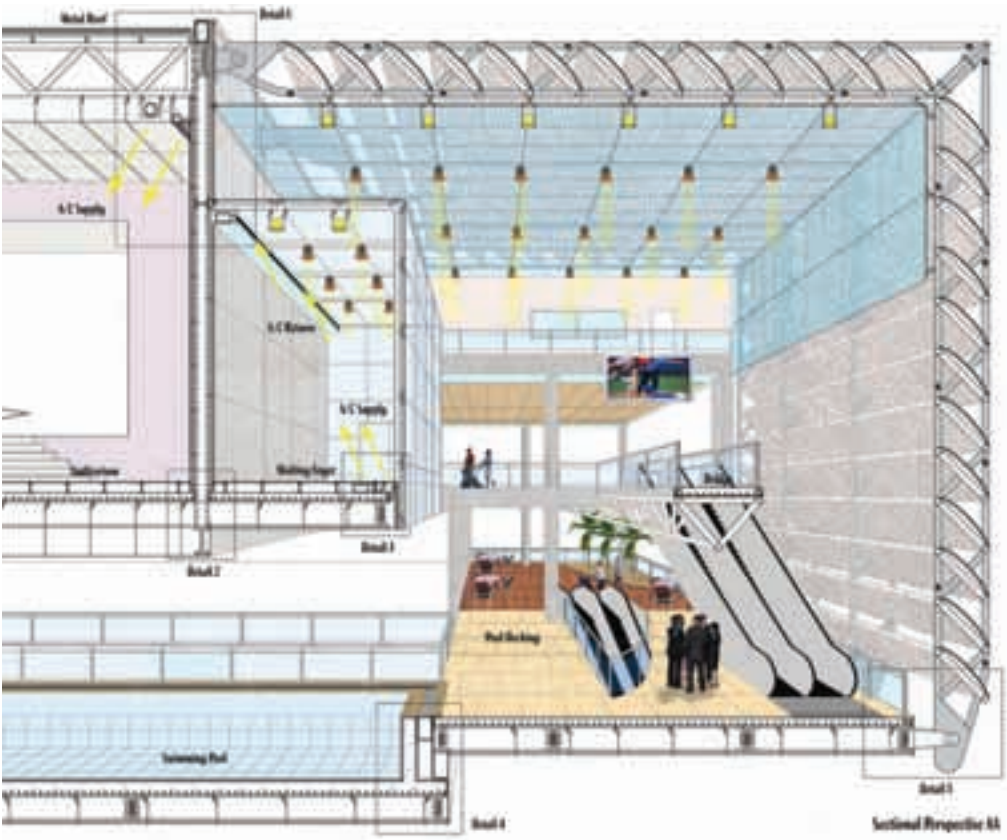
Situated at the feature space of ARCHinteractive is a waiting foyer leading to the auditorium. This waiting foyer is designed with a floating glass box that hovers over the swimming pool that allows visual connections.

Internal greenery acts as a visual buffer between the swimming pool and public circulation. The greenery also helps to reduce glare and improve indoor air quality.

ARCHinteractive is more than just an ecologically friendly structure; it is an aesthetically pleasing abode for events and interactions.



“THE ARCHINTERACTIVE IS AN URBAN VILLAGE DESIGNED FOR EVENTS, HAPPENINGS AND INTERACTIONS”
– Jonathan



Building upon their dreams and garnering awards. A winning eye for digital imagery. But there's one thing they share in common: a flair for creativity.

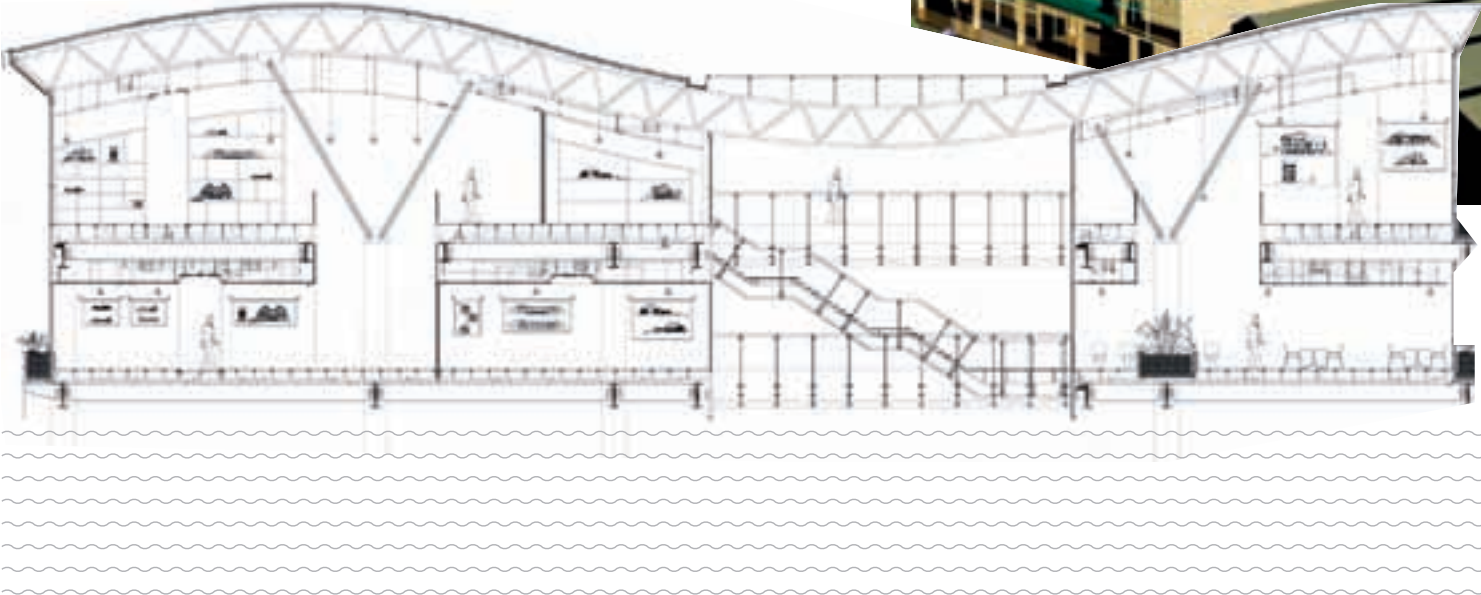
STUDENT'S VISION MAKES A WINNING SPLASH AT INTERNATIONAL ARCHITECTURE AWARDS

With a dream to bring back vibrancy to the Singapore River, Ng Cheng Ngai designed a nine-storey residential-retail-office tower along the waterfront incorporating bridges, art galleries and a roof garden.

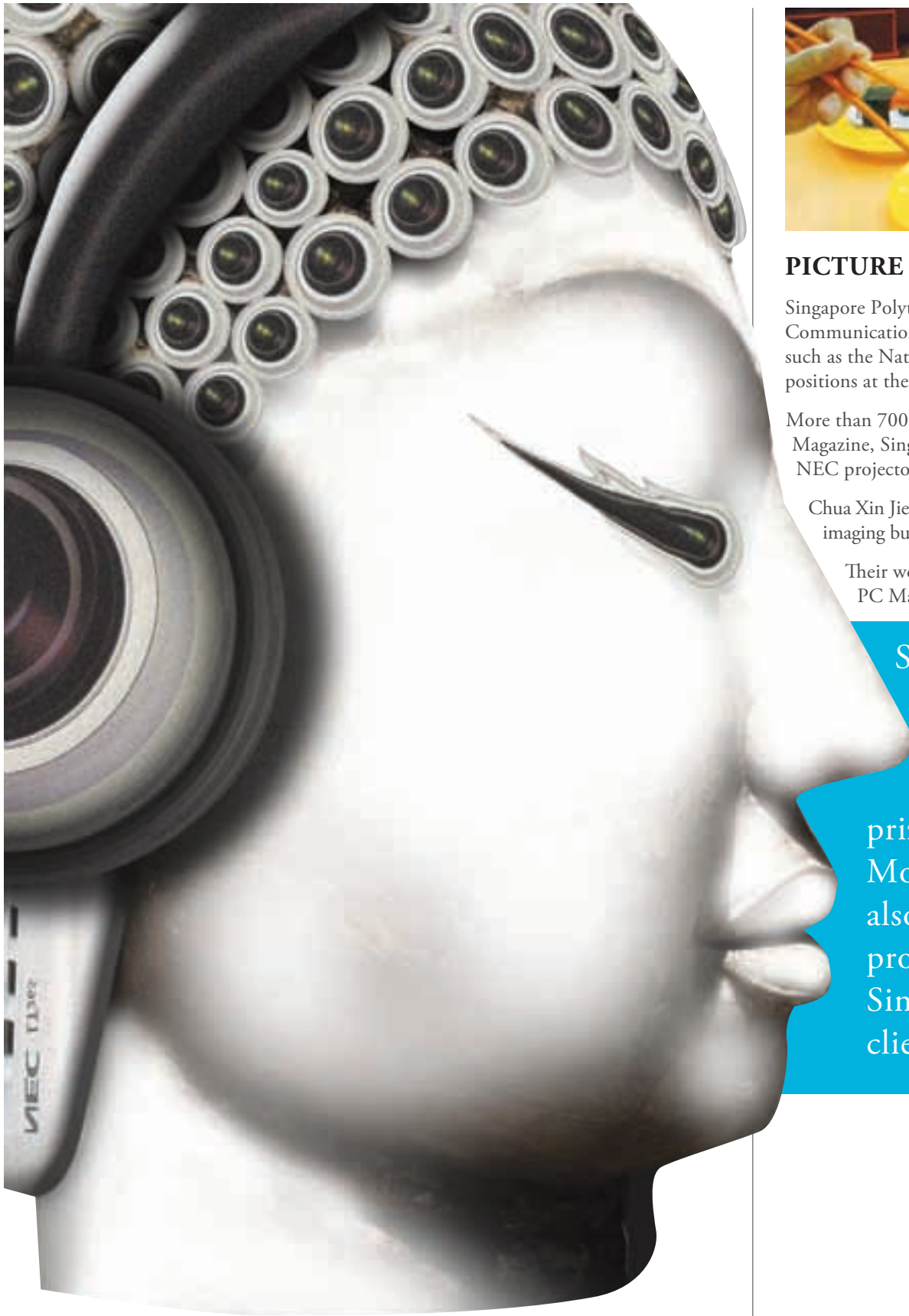
The vision of the then 19-year-old SP student so wowed distinguished industry experts and accomplished Bentley users at the 2005 Bentley Empowered Awards for Excellence, that he walked away with the top honour in the Academic Award category.

This international architecture design award recognises the extraordinary work of Bentley users in improving urban living.

The submission was Cheng Ngai's final year project for his Diploma in Architectural Technology course.



and the awards go to...



PICTURE PERFECT

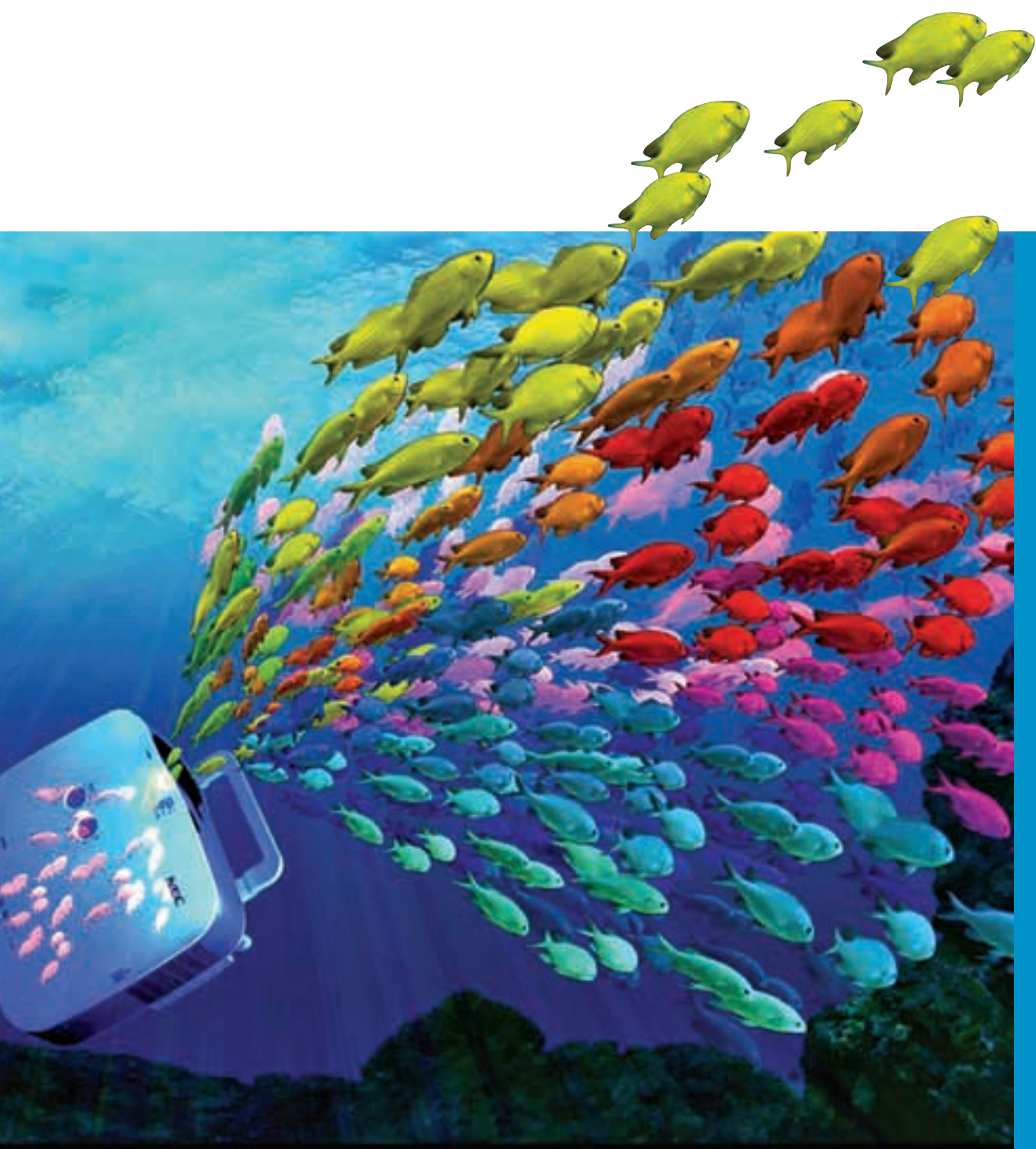
Singapore Polytechnic students from the School of Media and Info-Communications Technology (SMIT) outshone students from design schools, such as the National Academy of Fine Arts and La Salle, to bag the top two positions at the Digital Imaging Competition 2005.

More than 700 participants took part in the challenge issued by organiser PC Magazine, Singapore to create a fresh, original artwork using the image of an NEC projector.

Chua Xin Jie and Ho Wan Ru did not have any prior experience in digital imaging but figured they had the right creative stuff. And the judges agreed.

Their works were featured in the 2006 calendar produced by NEC and PC Magazine, Singapore.

Singapore Polytechnic excelled at the Digital Imaging Competition 2006 too. Student Gerald Khoo from the SMIT won the top prizes—the Platinum Award and the Most Creative Award. His works were also featured in the 2007 calendar produced by NEC and PC Magazine, Singapore and distributed to NEC clients worldwide.



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