RESEARCH & DEVELOPMENT
研究與發展

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DEVELOPMENT
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Where research stimulates ground-breaking discoveries
讓科研創新開天闢地

PolyU is passionate about interdisciplinary research. Working at the intersection of various disciplines sparks new insights and discoveries that are contributing to a better world.

理大熱衷跨學科研究，匯聚不同學術範疇，激發創新思維，讓突破性發明造福世界。

FUNDING FOR RESEARCH 科研經費

In addition to receiving funds allocated by the University, academics at PolyU applied for funding from external sources, either through competitive or non-competitive means, for their research projects in 2014/15. Total funding during the year amounted to HK$1,832.2 million in support of over 2,800 projects undertaken by more than 1,000 academic staff and around 1,140 research personnel.

除了大學提供的科研經費，學術人員同時積極透過競爭或非競爭渠道，申請校外不同種類的科研基金，以資助他們的科研項目。2014/15 年度，理大科研計劃的總資金為十八億三千二百二十萬，資助超過二千八百項科研計劃，而參與其中的學術人員有一千多名，科研人員約一千一百四十名。

Newly-funded projects in 2014/15 2014/15 年度新科研計劃

Funding Source 資金來源	No. of Projects 計劃數目	Total Amount (HK$m) 資助總額 (百萬港元計)
Research Grants Council 研究資助局	180	$142.31
Innovation and Technology Fund 創新及科技基金	62	$140.76
Other competitive grants 其他透過競爭渠道獲取的科研經費	53	$37.83
China Fund # 中國境內科研基金#	39	$23.66
Non-competitive grants* 非競爭性資助*	495	$214.27
Total 總數	829	$558.83

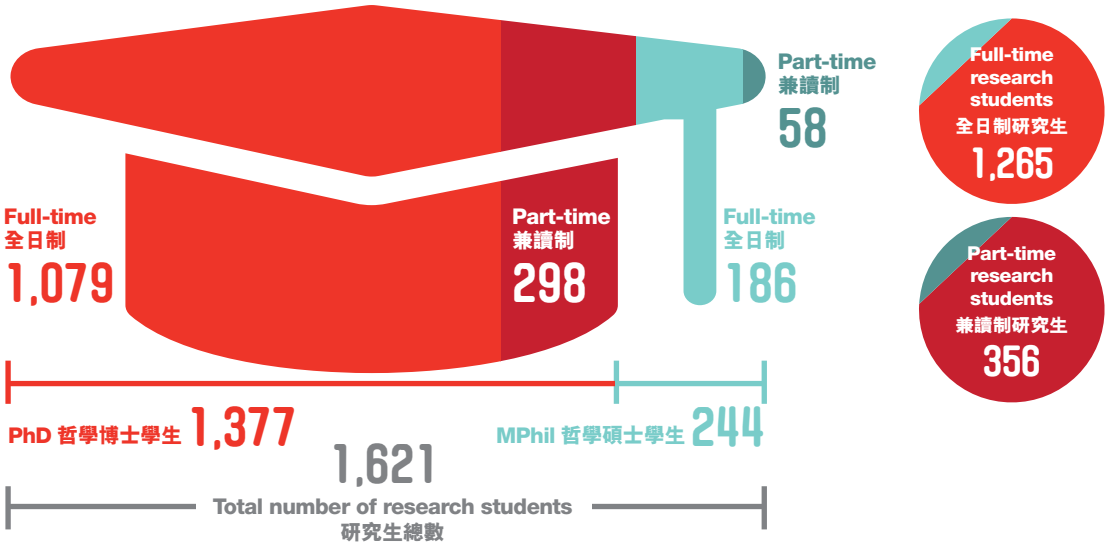
The amount is calculated at an exchange rate of RMB1: HKD1.2497 根據 1 人民幣 : 1.2497 港元的匯率計算

* Including industrial/commercial support and donations 包括工商機構贊助及捐贈

Number of research students
研究生人數

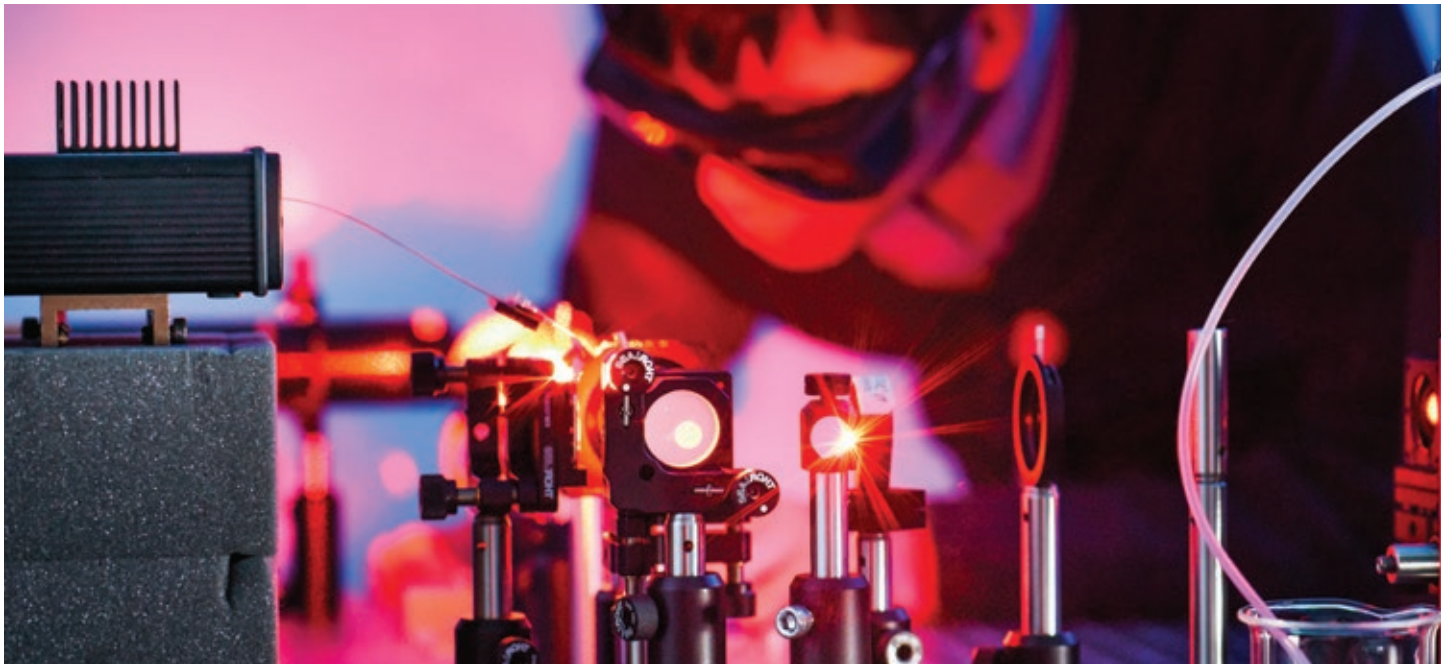
In 2014/15, a total of 1,621 research degree students were engaged in the following postgraduate courses of study:

2014/15 年度，共有一千六百二十一名學生修讀以下研究課程：



A total of 271 research students graduated in 2014/15, including 207 PhD and 64 MPhil graduates.

2014/15 年度共有二百七十一名研究生畢業，當中二百零七名是哲學博士學生，六十四人是哲學碩士學生。



PROJECTS FUNDED BY THE RESEARCH GRANTS COUNCIL COLLABORATIVE RESEARCH FUND
研究資助局協作研究金資助項目

Facility to validate barriers for debris flow impact

Geo-hazards have always been a great danger in Hong Kong and many other countries due to global warming, uncertain extreme weather and geological conditions, and continuing land development. Flexible barriers are being widely used to reduce the impact and risk of debris flows, yet current design methods have not been validated. PolyU is designing a large-scale, multi-function physical model facility to validate these methods. Construction of the facility began on the PolyU campus in November 2015.

泥石流災害防護網驗證設施

全球暖化、極端天氣和地質狀況的不確定性，以及持續開發土地令香港和多個國家出現地質災害。現時普遍採用柔性防護網以減低泥石流的影響和風險。然而，泥石流阻攔柔性防護網的設計方法仍有待驗證。理大正計劃建造一項大型及多功能物理模型設施，以驗證現有的防護網的設計方法。該項設施於2015年11月在理大校園開始興建。

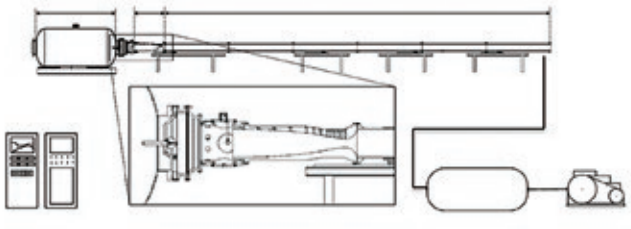
1

High-speed aerodynamics research facility

PolyU is constructing a multipurpose transonic-to-hypersonic Ludwieg tube facility to meet the most demanding high-speed ground testing parameters, with performance sufficient for 50ms test times at up to Mach 4 flow. Equipped with data-acquisition systems and flow visualization devices, the facility will enable further research and teaching in high-speed aerodynamics in Hong Kong. It will also enhance local aero-thermodynamic research in support of aerospace research on the Chinese mainland.

高速空氣動力學研究儀器

理大正建造一個多功能跨音速至高超音速路德維希管風洞，它可滿足地面高速流動實驗的嚴格要求，更可在高達4馬赫氣流下提供50ms以上的測試時間。此設施將配備資料獲取系統及視流系統，可促進香港高速空氣動力學範疇的科研和教育，亦有助本港進行氣熱動力學研究，從而支援中國內地的航空航太研究。



1

Schematic of the Ludwieg tube facility
路德維希管設施示意圖

2

High-output protein crystallography system

The University is in the process of setting up an accurate high-speed, high-output protein crystallography facility, which will greatly enhance the capacity of cutting-edge biomedical research and provide critical support to new drug research.

高輸出蛋白晶體衍射系統

大學現正設立一個快速、精確及高輸出的蛋白晶體衍射系統，可以大大提升在尖端生物醫學領域的研究能力，為新藥研發工作提供重要支援。

3

Ion mobility mass spectrometer for new drug research

PolyU has acquired an ion mobility mass spectrometer for the separation of ions based on their size and shape. With its high speed and high sensitivity capabilities, the mass spectrometer allows for effective acquisition of structural information of molecules. In addition, the ion mobility technology significantly enhances the ability to analyse complex samples and identify compounds by reducing background interference, allowing separation of isomers and providing additional compound identity information.

離子遷移質譜儀有助新藥開發研究

理大購置了一部離子遷移質譜儀，它可根據離子大小和形狀的差異實現離子分離。這部儀器具備高速和靈敏的特點，可有效地獲取樣本分子的結構信息。此外，離子遷移技術可減低背景干擾、方便異構體分離和提供化合物特性的其他信息，大大增強了質譜分析複雜樣本及辨認化合物的能力。

(Left) Protein crystallography facility
(左圖)蛋白晶體衍射系統

(Right) Ion mobility mass spectrometer
(右圖)離子遷移質譜儀

Exploring sustainable chemical syntheses

A multidisciplinary team of synthetic chemists and material and theoretical scientists from PolyU, The Hong Kong University of Science and Technology and The Chinese University of Hong Kong is tackling challenges related to green chemistry. Through their work in catalyst design and development, it is envisaged that effective synthesis can be achieved from biomass, thus facilitating Hong Kong's journey towards a low carbon economy.

可持續化學合成研究

理大、香港科技大學及香港中文大學的合成化學家、材料及理論科學家組成的了一支跨學科團隊，一起應對綠色化學領域上的挑戰。團隊期望透過催化劑的設計和開發工作，可以促進有效合成生物質，以推動香港邁向低碳經濟。

4

Design methodologies for improving wind and thermal comfort in the urban environment

PolyU is carrying out research with the goal of improving the environmental quality, liveability and public health in large cities through a modelling-based design methodology. The research looks at both temperature and wind at the pedestrian level in the community, which is subject to the Urban Heat Island effect as determined by macro-scale city morphology and the landscape. PolyU is conducting this research in collaboration with City University of Hong Kong, The Hong Kong University of Science and Technology, The University of Hong Kong, Hong Kong Observatory and University of Western Sydney.

城市小區風環境和熱舒適的設計方案

理大正利用一套基於模擬的設計方法進行研究，旨在提升大城市的環境質素、可居住性及公共健康。這項研究探討城市小區內與行人高度相若之處的溫度及風速，而該處的溫度及風速則受大城市佈局和地形造就的熱島效應所影響。這研究項目是由理大與香港城市大學、香港科技大學、香港大學、香港天文台及西悉尼大學共同進行。

5

Heterogeneous chemistry of atmospheric reactive nitrogen oxides

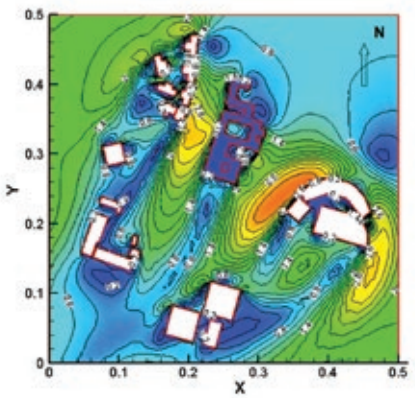
Employing cutting-edge, integrative computer simulations, this study explores the chemical reactions between gases and particles in the atmosphere and their contributions to air pollution. The project is being conducted by a multidisciplinary team from PolyU, The Hong Kong University of Science and Technology, The Chinese University of Hong Kong, a French research institute and the HKSAR Environmental Protection Department. The research findings are expected to support the mitigation of photochemical smog and haze pollution in Hong Kong, the Pearl River Delta, and other Chinese cities.

大氣氮氧化物的非均相化學研究

這項目應用尖端綜合計算機模擬科技，旨在研究大氣層氣態及顆粒態污染物之間的化學反應，以及它們對空氣污染的影響。跨學科研究團隊成員來自理大、香港科技大學、香港中文大學、一所法國研究機構及香港特區環境保護署。預期研究成果將有助減輕香港、珠三角和中國其他城市的光化學煙霧及灰霾等污染問題。

(Left) Velocity contours at a height of 2 m above the ground in North East wind direction obtained from numerical modelling
(左圖)距地面兩米高處在東北風向環境下的速度模擬圖

(Right) Ozone distributions over Guangdong simulated by regional air quality model
(右圖)區域空氣質素模型模擬廣東地區臭氧濃度的分佈



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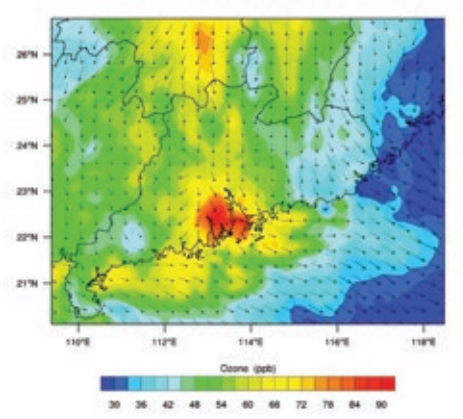


5

AT THE FOREFRONT OF SAFEGUARDING HEALTH
保障健康　走在前沿

Computer intelligence to detect acute strokes

Dr Tang Fuk-hay of the Department of Health Technology and Informatics has developed an acute stroke detection system using built-in artificial intelligence. Analyzing over 100 brain scans, the system is able to determine whether a patient has suffered an ischemic stroke or haemorrhagic stroke. Its diagnostic accuracy is 90%, as high as the accuracy of diagnoses by specialists but at a much reduced time of 3 minutes versus 10-15 minutes. This system can detect subtle and minute changes in the brain and learn by experience, dramatically cutting the chances of a missed diagnosis, minimizing damage to patients within 3 hours of stroke onset, and allowing more lives to be saved.

電腦智能偵測急性中風

醫療科技及資訊學系鄧福禧博士研發了一套配備內置人工智能、用作偵測急性中風的系統，它能透過讀取一百多張腦部電腦斷層掃描影像，診斷病人是否罹患缺血性中風或充血性中風。系統的診斷準確度達到百分之九十，與專科醫生的診斷準確度相若，但可由專科醫生診斷所需的十至十五分鐘時間減至三分鐘。系統可以偵測微細的腦部變化，更從經驗中學習，大大減低漏診機會，並在病者病發三小時內盡量令中風對其傷害減至最低，以期拯救更多生命。

The acute stroke detection system analyses computer images of brain scans
急性中風偵測系統分析腦部電腦斷層掃描影像

7

Nano-approach for remedying tendon degeneration

Research by Prof. Gabriel Ng of the Department of Rehabilitation Sciences involves two projects — one based on animals (basic science approach) and another on humans (clinical study approach). The study with animals tested the strength of degenerative tendons after treatment by custom-made external herbal patches (some processed with nano-technology), while the study with humans examined the effect of nanomized herbal applications for treating tendon degeneration in the foot. Preliminary findings show that patients experienced a significant decrease in pain and increase in range of movement with their treated tendons after two weeks of treatment.

納米技術治療退化筋腱

康復治療科學系吳賢發教授正進行的研究包括兩個項目：一個是動物實驗(基礎科學方向)，而另一個則為人體實驗(臨床研究方向)。動物實驗測試經過特製外用中草藥貼療後(部分經過納米化處理)，動物的退化筋腱之強度。人體實驗則檢定納米化中草藥在足部筋腱退化情況中的治療效果。初步數據顯示病者經過兩星期治療後，痛楚明顯減低及筋腱活動範圍明顯擴大。

8

A simple and rapid method for drug abuse detection

Confirmatory techniques used in drug abuse analysis require laborious and time-consuming sample preparation procedures. Dr Yao Zhongping of the Department of Applied Biology and Chemical Technology has developed a simple method that uses an ordinary wooden tip (such as a toothpick) to collect samples and reliably detect and quantify abused drugs in urine and oral fluids within minutes. Upon applying a high voltage to the wooden tip, spray ionization is induced to detect ion signals of analytes.

簡單快速的濫藥檢測方法

現行的濫用藥物分析方法涉及繁複的樣本處理工序，耗時費力。應用生物及化學科技學系姚鍾平博士於是利用木籤（如家用牙籤）收集樣本，數分鐘內便可從尿液或唾液樣本中準確地得知有否濫用藥物及其份量。新方法利用木籤黏附樣本，並在高電壓情況下產生噴霧電離，從而測出分析物的離子信號。

9

Hong Kong's first breast milk nutrient database

Led by Dr Wong Man-sau of the Department of Applied Biology and Chemical Technology, a research team analysed the diet nutritional characteristics and level of polyunsaturated fatty acids in the breast milk of 74 Hong Kong lactating women. The objective was to examine how daily diet affects the nutritional composition of breast milk and establish Hong Kong's first breast milk nutrient database. The results showed that the DHA level in over 80% of the subjects' breast milk met the adequate intake level recommended by the Chinese Dietary Reference Intakes, and hence, sufficient DHA was supplied to infants for normal brain and vision development.

香港首個母乳營養資料庫

應用生物及化學科技學系黃文秀博士帶領研究團隊為七十四名哺乳期婦女進行調查，分析她們的飲食習慣，並研究其母乳的營養成分及多元不飽和脂肪酸含量。這項目旨為研究日常飲食如何影響母乳的營養成分，以及建立香港首個母乳營養資料庫。結果顯示逾八成研究對象的母乳的多元不飽和脂肪酸 (DHA) 含量達中國居民膳食營養素標準，足以供嬰兒正常的腦部及視力發展。

7

Applying Chinese herbal plaster onto the injured tendon
在受損筋腱敷上中草藥貼

8

Wooden toothpick to collect samples for drug abuse analysis
木牙籤收集樣本進行濫藥分析

9

PolyU establishes Hong Kong's first breast milk nutrient database
理大建立香港首個母乳營養資料庫

10

Rapid authentication of edible oils and gutter oils

Dr Yao Zhongping of the Food Safety and Technology Research Centre under the Department of Applied Biology and Chemical Technology has developed a new method for the rapid authentication of edible oils and screening of gutter oils. Using matrix-assisted laser desorption/ionization mass spectrometry (MALDI-MS), high quality and highly reproducible MALDI-MS spectra results can be obtained and a preliminary spectral database of commonly used labelled edible oils has been set up. As different types of edible oils have different MALDI-MS spectral patterns, the authenticity of an edible oil sample can be determined within five minutes by comparing its MALDI-MS spectrum with those of its labelled oil in the established database. Since this method is capable of authenticating edible oils, it can also determine whether samples are gutter oils.

快速鑒別食用油和地溝油

應用生物及化學科技學系轄下食物安全及科技研究中心姚鍾平博士研發出快速鑒別食用油和篩查地溝油的新方法。運用基質輔助激光解吸電離質譜技術，得出高質量和重現性高的譜圖，並由此建立了一個常用食用油的初步譜圖數據庫。由於不同種類的食用油顯示不同的譜圖，通過與數據庫中相應的食用油標準譜圖比較，五分鐘內便可鑒別一個食用油樣本的真偽。這新方法可鑒別食用油，亦可用於篩查樣本是否地溝油。

11

Probing into metalinguistic awareness and developmental dyslexia

Dr Leung Man-tak of the Department of Chinese and Bilingual Studies is investigating theory driven intervention for Hong Kong primary students suffering from developmental dyslexia. A virtual centre equipped with databases and standardized tests was set up for this purpose. The study has been extended to the Chinese mainland and an attempt to design an educational programme for Non-Chinese-Students learning Chinese.

探索後設語言覺識及發展性讀寫障礙

中文及雙語學系梁文德博士正研究為香港患有讀寫障礙的小學生而設的理論主導治療。他建立了一個設有數據庫及標準測試的虛擬中心。這項研究更擴展至中國內地，並試行為非華語學生設計學習華語的課程。

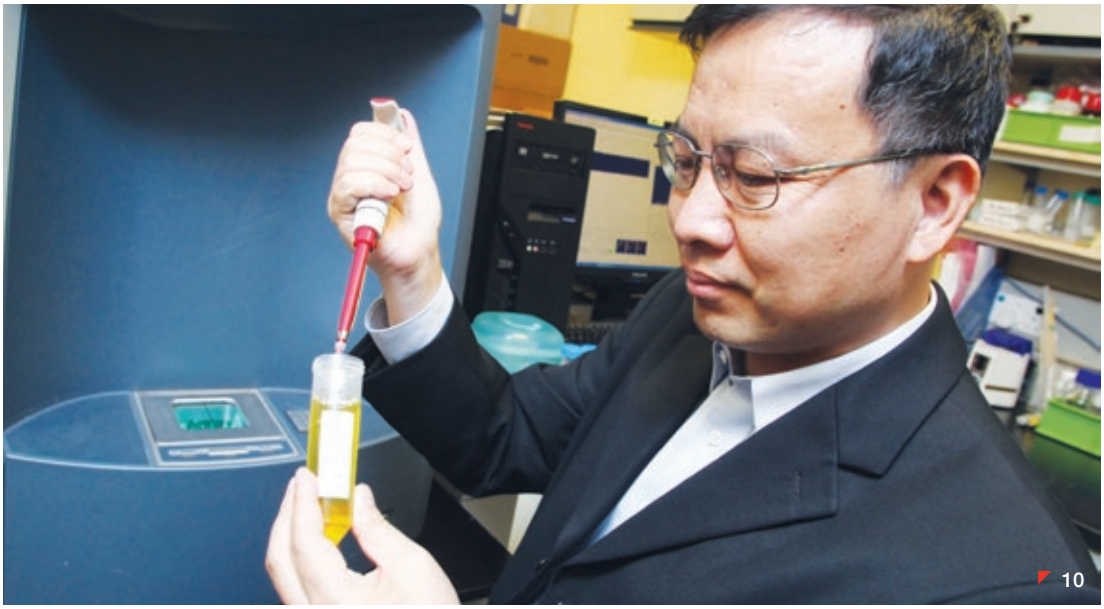
12

Big data analysis for revealing gene interactions in cancer

Prof. Benjamin Yung of the Department of Health Technology and Informatics is exploring pair-to-pair correlations between genes to decipher the mechanism underlying cancer. His research team has developed a big data analytics method that can analyse the co-expression of 0.2 billion gene pairs in just two days. This novel structural co-expression network analysis platform has revealed the cancer pathogenesis and its potential Nucleophosmin (NPM1)-oriented treatment strategy in Chronic Myelogenous Leukemia (CML). The platform can also be readily applied to other diseases for diagnostic, prognostic and therapeutic investigation.

大數據分析揭示癌症基因關係

醫療科技及資訊學系翁一鳴教授探究每對基因之間的關係，從而破解癌症背後的機制。研究團隊發展了一套大數據分析方法，只需兩天便可分析兩億個基因對的共同表現。這創新的結構性基因共同表現分析平台揭示了癌症發病機理，與及研發以核磷蛋白導向的策略治療慢性骨髓細胞白血病。這平台亦可應用在其他疾病的診斷、預後和治療研究。

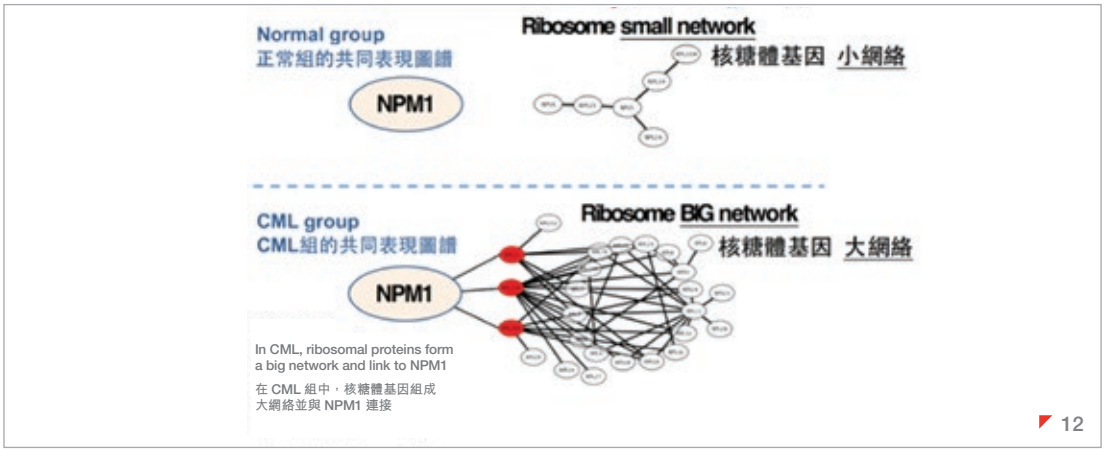


10

Application of matrix-assisted laser desorption/ionization mass spectrometry in rapid authentication of edible oils
運用基質輔助激光解吸電離質譜技術，可快速鑒別食用油

11

Different games are designed based on children's learning stages
因應兒童學習階段而設計不同的遊戲



12

In Chronic Myelogenous Leukemia, ribosomal proteins form a big network and link to Nucleophosmin
在慢性骨髓細胞白血病組中，核糖體基因組成大網絡，並與核磷蛋白連接

COLLABORATION LEADS TO RESEARCH INSIGHTS
攜手協作　迸發科研創見

Visual perspectives of products and services affect consumer behaviour

In a joint study with professors from The Hong Kong University of Science and Technology, Tel Aviv University and The Chinese University of Hong Kong, Dr Jiang Yuwei of PolyU's Department of Management and Marketing found that multiple visual perspective descriptions of products and services may have a detrimental effect on consumer evaluations. The research has shown that when individuals were disposed to construct an image-based narrative representation of the use of a product or service, differences in the visual perspectives of the images made it difficult to construct mental images that, consequently, had a negative impact on evaluations of the product or service. In contrast, when individuals are simply motivated to acquire information about the product or service, pictures from different perspectives serve as references, thus enhancing their evaluations.

產品及服務的視覺角度影響消費者的行為

理大管理及市場學系姜宇威博士與香港科技大學、臺拉維夫大學及香港中文大學的教授聯合研究發現，多重視覺角度的描述可能對消費者評價產品或服務有負面的影響。研究結果顯示，當消費者接受影像去敘述產品的用途或服務時，視覺角度的變動使目標影像難以清晰呈現於消費者的腦海，因而對消費者評價產品或服務有負面的影響。相反地，當消費者需自行查詢產品或服務的資料時，不同角度的影像只作參考，他們對產品或服務的評價亦見提高。

New advances in urban sustainability

In 2014/15, PolyU's Research Institute for Sustainable Urban Development (RISUD) added four new research groups, taking the total number of research groups to 33. They are organized into five divisions: the Division of Urban Systems, Division of Urban Infrastructure, Division of Urban Environment, Division of

可持續城市發展屢見新猷

2014/15 年度，可持續城市發展研究院新增了四個研究小組，研究小組總數增至三十三個，分別隸屬：城市系統分部、城市基建分部、城市環境分部、綠色建築分部及智慧城市分部。年內，研究院

Green Buildings, and Division of Smart Cities. During the year, RISUD initiated the following collaborative/inter-disciplinary research projects with government departments and industry to support the development of smart new towns in Hong Kong:

- New Ways of Development for New Towns in Hong Kong: Social-Economic-Environmental Integrative Planning Systems for Community (led by Prof. Edwin Chan)
- Integrated Smart Energy Systems for Smart Towns (led by Prof. Wang Sheng-wei)
- Wastewater-derived Energy for Smart Towns (led by Prof. Li Xiang-dong)
- Integration of Communication, Positioning, and Surveillance Infrastructures for Smart New Towns (led by Prof. Chen Wu)

On 26 August 2014, RISUD organized a University-Government-Industry trilateral forum to explore new town development in Hong Kong. The forum brought together senior government officials, industry practitioners and scholars who discussed topics such as planning for social-economic-environmental integration, smart infrastructure for sensing cities, pedestrian-oriented mobility, self-contained environmental systems, energy efficiency and renewable energy.

In 2014/15, two projects under RISUD were funded by the Innovation and Technology Fund:

- Development of a Hong Kong Indoor Positioning Infrastructure based on GPS Technologies (led by Prof. Ding Xiao-li and Prof. Chen Wu)
- Location-based Technologies for Asset Tracking and Risk Management (led by Prof. Li Heng)

Two other projects were funded by the Research Grants Council Collaborative Research Fund:

- Development of Design Methodologies for the Improvement of Wind and Thermal Comfort in the Urban Environment (coordinated by Prof. Mak Cheuk-ming)
- Heterogeneous Chemistry of Atmospheric Reactive Nitrogen Oxides: From Capability Development to Cutting-edge (coordinated by Prof. Wang Tao)

與政府及業界攜手合作，倡導以下協作/跨學科科研項目，推動香港的「智能城市」的發展：

- 陳漢雲教授領導的香港新市鎮開發的新模式：以建立社區為本的綜合系統規劃
- 王盛衛教授領導的智慧城鎮之智能化集成能源系統
- 李向東教授領導的智慧城鎮的廢水能源轉化技術
- 陳武教授領導的智能城市通訊、定位及監控基礎設施的集成研究

2014 年 8 月 26 日，可持續城市發展研究院舉辦了一個官產學三方論壇，匯集政府高層官員、業界及學者，探討在香港發展新市鎮的新模式。討論的議題包括：考慮社會、經濟及環境因素的綜合規劃、用作感應城市的智能基建、行人優先的交通流動性、獨立自足的環境系統，以及能源效益與可再生能源。

2014/15 年度，兩個研究院的科研項目獲創新及科技基金資助：

- 丁曉利教授和陳武教授領導的基於 GPS 技術的香港室內定位平台
- 李恆教授領導的基於定位技術之資產追蹤及風險管理

另外兩個項目獲研資局的「協作研究金資助計劃」撥款：

- 麥卓明教授負責的城市小區風環境和熱舒適的設計方法研究
- 王韜教授負責的大氣氮氧化物的非均相化學研究：前沿科學綜合項目

More than 280 experts, researchers and industry practitioners from 19 countries and regions gathered on 7–9 January 2015 for the Second International Conference on Sustainable Urbanization, jointly organized by RISUD and PolyU's Faculty of Construction and Environment. In addition to plenary lectures by distinguished speakers, the conference held six symposia under distinct themes:

- Emerging Materials and Technologies for Sustainable Infrastructure
- Sustainable Urban Renewal in High-Density Cities
- Sustainable Water in Cities
- Urban Data and Urban Computing
- Energy Saving and Renewable Energy Technologies for Buildings
- Second Cross-Strait Forum on Sustainable Urban Development

逾二百八十位來自十九個國家及地區的專家、科研人員及業界人士，於 2015 年 1 月 7 至 9 日出席由可持續城市發展研究院與理大建設及環境學院合辦的第二屆可持續城市化國際學術會議。除了由傑出講者主講多個講座之外，還設有以下六個專題研討會：

- 可持續新型基建材料及技術
- 高密度城市的可持續市區重建
- 城市可持續水供應
- 城市數據與城市運算
- 建築物節能及再生能源技術
- 第二屆海峽兩岸可持續城市發展論壇

Pushing the frontiers of aviation services research

推動航空服務研究

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During the year, the Aviation Services Research Centre (ASRC) installed new facilities and large equipment, including the 5-axis Horizontal Machining Centre, Tool Presetter, Measuring and Shrinking Machine and a Robotic Drilling System. The Phase Two workshop with an approximate area of 100m^2 is currently under renovation with a planned opening in February 2016 to accommodate shot blasting and spraying robots as well as advanced new equipment. The Centre now has a research team of over 20 members from Hong Kong and overseas with diverse research backgrounds and experience.

年內，航空服務研究中心新增了設施及大型設備，包括：五軸臥式加工中心、刀具預調機，測量和收縮機的機械人鑽井系統。佔地一百平方米的第二期工場正進行翻新工程，並計劃於 2016 年 2 月投入服務，而噴丸處理和噴塗機械人及其他先進設備將置於第二期工場內。現時，中心的研究團隊有來自本地及海外、具備不同研究背景及豐富經驗的二十多位研究人員。

In addition, ASRC successfully obtained Innovation and Technology Fund (ITF) grants amounting to a total of HK$51M for five new projects. The two projects approved by ITF first round grant were completed in June 2015.

此外，航空服務研究中心成功獲得創新及科技基金共五千一百萬港元資助，作為五個新項目的研究經費。而此基金第一輪資助的兩個項目已於 2015 年 6 月完成。

New projects:

- Automation of Coating, Marking, and Recording Processes for Aircraft Components Maintenance
- Intelligent Maintenance, Repair and Overhaul (MRO) Business Management Systems
- Feasibility Study in Optimizing Modular Wing Docking Platform for Local MRO
- Surface Defect Detection and Correction of Metallic Components
- Rapid Manufacture of Metallic and Composite Aircraft Components

新項目：

- 飛機部件維修的噴塗、標記及記錄工序自動化
- 智能飛機維修工程業務管理系統
- 優化模塊化機翼對接平台供本地飛機維修工程的可行性研究
- 表面缺陷檢測和金屬部件的矯正
- 金屬和複合材料飛機零部件的快速製造

Completed projects:

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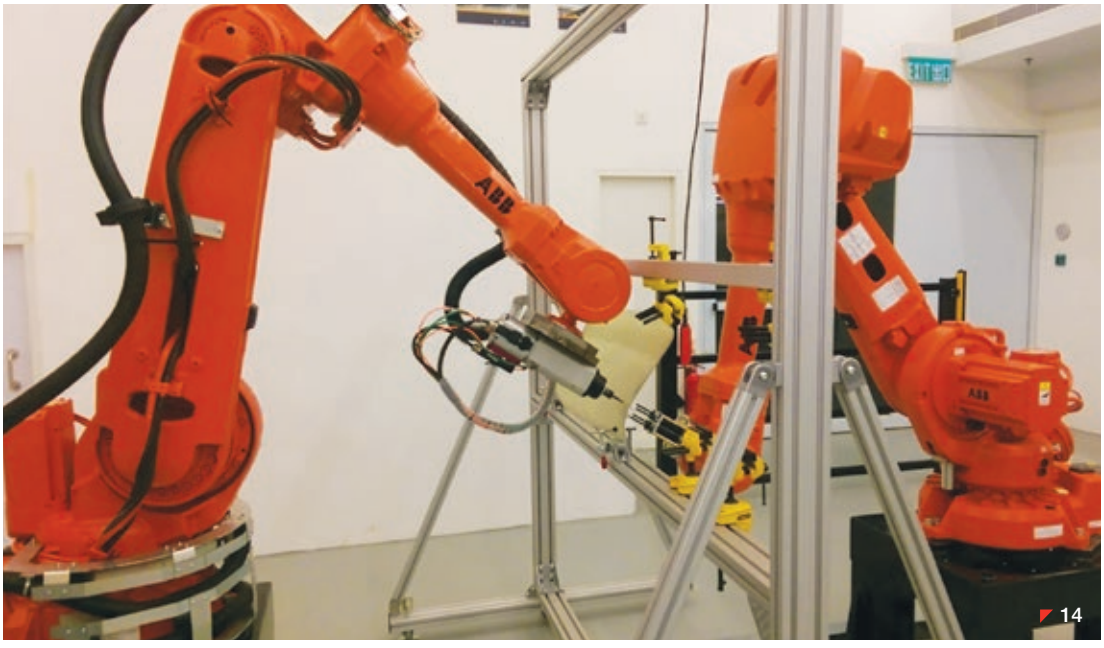
- Laser Projected Drilling Templates and Robotics Drilling (More on p.100)
- Mechanical Refurbishment of Aviation Parts

已完成項目：

- 激光投射鑽模板和機械鑽 （詳見第 100 頁）
- 航空零部件的機械翻新

Installing starrag
5-axis machine
安裝 Starrag 五軸機情況



Twin Robotic
Drilling Cell
雙機械人鑽孔裝置

MAJOR AWARDS FOR RESEARCH AND DEVELOPMENT PROJECTS
獲獎科研項目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43rd International Exhibition of Inventions (Geneva, Switzerland, 15-19 April 2015)
第四十三屆國際發明展 (瑞士日內瓦，2015 年 4 月 15-19 日)

Award 獎項	Project 項目	Principal Investigator/ Faculty/ Department 首席研究員／學院／學系
15 Grand Prize and Gold Medal with the Congratulations of Jury 特別大獎及評判特別嘉許金獎	i.Dummy: Robotic Mannequin for Fashion Design and Fitting i.Dummy：智慧可調節型人體模型	Dr Allan Chan Chee-kooi, Institute of Textiles and Clothing 紡織及製衣學系陳志駒博士
16 Grand Prize and Gold Medal 特別大獎及金獎	Catalyst for Green Biodiesel Production from Unrefined Feedstock 綠色生物柴油催化劑	Dr Yung Ka-fu, Department of Applied Biology and Chemical Technology 應用生物及化學科技學系容家富博士
17 Special Merit Award and Gold Medal with the Congratulations of Jury 特別優異獎及評判特別嘉許金獎	Internet of Things (IoT)-based Advanced Automobile Parking Navigation System 基於物聯網的先進車輛停泊導航平台	Dr Andrew W.H. Ip, Department of Industrial and Systems Engineering 工業及系統工程學系葉偉雄博士
18 Special Merit Award and Gold Medal 特別優異獎及金獎	Posture Correction Girdle for Adolescents with Early Scoliosis 供患早期脊柱側彎的青少年使用的姿勢矯正束身衣	Dr Joanne Yip Yiu-wan, Institute of Textiles and Clothing 紡織及製衣學系葉曉雲博士
19 Special Merit Award and Gold Medal 特別優異獎及金獎	Rehabilitation Sleeve – A Functional Electrical Simulation (FES)-robotic Hybrid System 復康袖－智感肌電混合上肢復康訓練系統	Dr Hu Xiaoling, Interdisciplinary Division of Biomedical Engineering 生物醫學工程跨領域學部胡曉翎博士
20 Special Merit Award and Silver Medal 特別優異獎及銀獎	O-blanket: Phototherapy Device for Neonatal Jaundice O-毯：新生兒黃疸光療設備	Prof. Tao Xiaoming, Institute of Textiles and Clothing 紡織及製衣學系陶肖明教授
21 Silver Medal 銀獎	Adaptive Hydrotherapy Wetsuit 水療浮水衣	Dr Kristina Shin, Institute of Textiles and Clothing 紡織及製衣學系 Kristina Shin 博士
22 Silver Medal 銀獎	Durable, Washable and High Performance Conductive Textiles 耐洗的高性能導電織物	Dr Zheng Zijian, Institute of Textiles and Clothing 紡織及製衣學系鄭子劍博士
23 Silver Medal 銀獎	Intelligent Condition-based Key Machinery Asset Maintenance Management Platform 智能設備維護管理平台	Prof. Eric Ngai Wai-ting, Department of Management and Marketing 管理及市場學系倪偉定教授


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