

# Overview of Research Activities of The University of Hong Kong 2012–13

## 1. Institutional Policy on Research

1. The University of Hong Kong (HKU) strives to attract and nurture outstanding scholars from around the world through excellence and innovation in teaching and learning, research and knowledge exchange, contributing to the advancement of society and the development of leaders through a global presence, regional significance and engagement with the rest of China.

2. Flowing directly from this institutional vision, HKU's research policy aims to strengthen its capabilities in both basic and applied research within a culture that strives for excellence and relevance as well as collaboration. The University emphasises innovative, high-impact and multidisciplinary research, and believes that a fine research record enhances the quality of research postgraduate education. It recognises that it must be fully accountable for the effective management of the public and private resources it deploys towards its research aims, and welcomes the opportunity to act in partnership with the wider community to generate, disseminate and apply knowledge.

3. To further develop HKU's research excellence and to realise its vision to be recognised as one of the top research-led universities in Asia and in the world, the University Research Committee has developed five strategies:

- (a) to develop strategic research areas and themes;
- (b) to support 'blue-sky' and curiosity-driven research;
- (c) to nurture next-generation scholars and researchers;
- (d) to encourage knowledge transfer to community and society; and
- (e) to enhance international and Mainland collaborations.

4. The University's Strategic Research Themes (SRTs) initiative, launched in 2004, places particular emphasis on strategic interdisciplinary research in selected fields for the valuable synergies it can produce. The completed second round of the initiative—with 19 strategic research themes and 4 emerging strategic research themes grouped under 5 areas of interdisciplinary research for focused support for a three-year period—was reviewed during the reporting period. Based on this review and after assessing emerging areas of strength at HKU, the third cycle of the initiative is being launched. For 2013–2016, there will be 16 strategic research themes and 5 emerging strategic research themes, grouped under the 5 areas of *Community, Biomedicine, Environment, Frontier Technology* and *China*.

5. While strengthening its research focus in this way, the University is also investing in the human resources necessary to sustain a research culture dedicated to excellence. As reported previously, it has been aiming to recruit additional professoriate faculty members internationally through a recruitment plan; increase the proportion of full professors; and increase the number of postdoctoral fellows and research postgraduate students.

6. Within this broad strategic framework the University continues to encourage research excellence in a number of important specific areas. It continues to fund curiosity-driven research with small project grants, and to incubate new research initiatives with seed-funding grants. It continues, through its RPg reform policies, to develop a culture of student-centred, performance-based, and shared-responsibility research.

7. The following institutional policy developments took place during the report period.

#### *Strategic Research Areas and Themes*

8. Prioritised support is given to collaborative, interdisciplinary research through the University's strategic research areas and themes. After reviewing the completed second cycle of this funding initiative, and exploring new and important niche areas of research to develop, the third round of focused investment is underway. In this cycle, 16 themes have been identified along with 5 emerging themes. The five broad areas of focus continue from the previous round—Community, Biomedicine, Environment, Frontier Technology and China. New themes include Neuroscience, with new emerging themes on Food; Law, Literature and Language; and Integrative Biology.

#### *Research Integrity*

9. Promoting responsible academic conduct has been made a top priority of the research management at the University. While achieving excellence, HKU hopes to establish a culture of upholding research integrity among the university community.

10. Professor Frederick K.S. Leung has been appointed as the Director of Education and Development for Research Integrity since June 2011. His remit includes looking into areas covering RCR training and education for staff and students, as well as the latest developments in research and good practice elsewhere, while research ethics compliance will continue to be handled by the relevant ethical approval bodies, namely the Human Research Ethics Committee for Non-Clinical Faculties (HRECNCf), the Institutional Review Board of the University of Hong Kong/Hospital Authority Hong Kong West Cluster (HKU/HA HKW IRB, the "IRB"), and the Committee for the Use of Live Animals in Teaching and Research (CULATR).

11. A number of on-going and new initiatives have been undertaken during the past year to promote responsible conduct of research. Since March 2010, nine Responsible Conduct of Research (RCR) seminars have been organised, two of which were held in the reporting year in November 2012 and April 2013. More than 670 academics at all grades, from Postdoctoral Fellows to Chair Professors, have attended these nine RCR seminars. The RCR seminar has now become a regular event that is held twice yearly. Since July 2012, all new staff are required to attend an HKU RCR session/seminar within 12 months of assuming duty at the University to be eligible for internal research and conference support and research postgraduate student supervision.

12. The Policy for Ethical Practice in Research of the University has been reviewed. The revised policy entitled "Policy on Research Integrity" was approved by the Council at its meeting held on January 29, 2013 and adopted with immediate effect. Amendments have also been made to the Regulations Governing Students' Academic Conduct

Concerning Assessment to align with the revised Policy.

13. The Research Integrity Funding Scheme was established in 2012–13 to encourage Faculties to tailor research integrity education and training programmes/activities for their members to promote their awareness of research integrity. Four proposals have been funded in the first round.

14. A U21 Workshop on Dealing with Research Misconduct was hosted by the University on behalf of Universitas 21 on December 10 and 11, 2012. Day 1 of the workshop was a closed door session for invited U21 delegates, and Day 2 was open to all U21 staff and students, and local guests from higher education institutions, government agencies, funding organisations, and ethics committees of hospitals in HK.

#### *HKU–SPACE Research Fund*

15. Through the HKU SPACE Research Fund—established since 2007–08 to support research activity at the University—HK\$2.5 million is made available every year to all newly appointed staff within the first twelve months of assuming duties to apply for a top-up grant of up to HK\$108,800 to support a Type B RPg place. All awards are made on condition that the top-up grant will be matched dollar-for-dollar by the applicant’s Faculty/Department, and the associated Type B RPg quota place should be from the Faculty’s main pool allocation for the current quota year.

## **2. Collaborative Research**

16. Collaboration in research at a wide range of levels is highly valued by the University’s management and by individual researchers. Internationalisation has been a key feature embedded in many aspects of the University’s strategic development. HKU has positioned itself to be a globally competitive, regionally engaged university, and in the face of the challenges ahead, we very much value the enhancement of collaboration with our international and Mainland partners. In addition to joining forces with local institutions, the University is an active participant in Universitas 21 (U21), a consortium of leading universities around the world dedicated to the internationalisation of higher education. HKU is also a member of the Association of Pacific Rim Universities, a regional network of 42 world-class institutions.

17. The University also collaborates with a number of leading institutions, laboratories, pharmaceutical companies, research institutes and government bodies, both in mainland China and overseas. HKU currently has 5 Partner State Key Laboratories, on Brain and Cognitive Sciences, Emerging Infectious Diseases, Liver Research, Synthetic Chemistry, and Pharmaceutical Biotechnology. We will continue to make good use of the prestigious status of Partner SKLs to reinforce our research collaborations with Mainland partners for greater impact. Partnership with industry has also been reinforced to promote the application of research results.

18. Another form of international partnership by the University to enhance research collaborations with other world-class higher education institutions is through Joint PhD Degree programmes. Currently, the University has signed agreements with King’s College

London, Imperial College London and the University of Toronto. The joint PhD programmes offer students opportunities to benefit from shared research excellence in a wide range of disciplines between HKU and its partners and to acquire enriching international experience.

19. New initiatives for international collaboration during the reporting year include the signing of a memorandum of understanding (MoU) between the School of Public Health of HKU and the Harvard School of Public Health to advance collaboration in advancing the public's health through learning, discovery and communication. The two Schools have a longstanding collaboration, initiated in 2001, and this MoU aims to further strengthen the working relationship between faculty members and graduate students. The two Schools will work together to develop collaborative research activities on public health issues pertinent to China and the Asia Pacific. An MOU was also signed for cooperation on environmental issues between HKU and the China Council for International Cooperation on Environment and Development (CCICED) to provide policy advice to the Chinese Government on environmental issues. Over the next five years, HKU will participate in relevant research and activities to help develop policies for China that would take into consideration the demands and attributes of development and environment relevant to CCICED objectives. Other developments with Mainland partners include a draft agreement on “HKU-Zheda-Tsinghua collaborative research and innovation lab on infectious disease treatment” signed with Zhejiang University and Tsinghua University Beijing to cooperate together with the Chinese Center for Disease Control and Prevention, and other Mainland research institutes and academics in areas of knowledge and talent exchanges, postgraduate students training and sharing of research resources. Also, an opening ceremony was held for the Hong Kong-Guangdong Joint Laboratory on Stem Cell and Regenerative Medicine, which is established at the HKU Li Ka Shing Faculty of Medicine and co-managed by Guangzhou Institutes of Biomedicine and Health (GIBH) under the Chinese Academy of Sciences and HKU. With an aim to better human health, the laboratory will facilitate knowledge exchange and will promote collaborations between HKU and GIBH researchers, as well as further advancing clinical research on stem cell and regenerative medicine.

20. The HKU Shenzhen Institute of Research and Innovation (HKU-SIRI)—incorporated in March 2011, with an opening ceremony on December 30, 2011—is an integral part and an extension into the Chinese Mainland of the research conducted by HKU, and it also plays an important role in transferring science and technology from HKU to the Mainland. It promotes hi-tech, knowledge transfer, industry incubation, and the introduction of key laboratories and research centres. HKU-SIRI has been eligible to apply for national funding schemes in China since 2011, and has been active since then in bidding for funds under the National Key Basic Research Development Program (973 Program) (國家重點基礎研究發展計劃–973 計劃) and the National Natural Science Foundation of China (NSFC) (國家自然科學基金). For example, in 2012 HKU-SIRI received total funding of RMB16 million for two projects under 973 and RMB20 million for 32 projects under NSFC. In addition, HKU-SIRI was successful in bidding for funds under the Science and Technology Program organised by the Science, Technology and Innovation Commission of Shenzhen Municipality (for applications in Shenzhen only). HKU-SIRI received total funding of RMB5 million for 6 projects in 2012 under this programme.

21. The HKU-Zhejiang Institute of Research and Innovation (HKU-ZIRI) was incorporated in December 2012 and had its Foundation Stone Laying Ceremony on February 16, 2013 in Lin'an. It provides the University a unique opportunity to set up an R&D base in the Yangtze River Delta Region and to facilitate knowledge and technology transfer of the University on the Mainland. HKU is partnering with the Department of Science and Technology of Zhejiang Provincial People's Government, in collaboration with Hangzhou Municipal Government and Lin'an City Government. The first three R&D laboratories of the Institute will be led by the Faculty of Engineering and are specialising in Industrial Internet-of-Things, Nanofluids and Thermal Engineering, and Aerodynamics and Acoustics. It has been planned that by 2016, HKU-ZIRI will be expanded to comprise six world-class research laboratories, joint laboratories or projects with enterprises. Two of the chief scientists of the current R&D Laboratories, Professor George Huang and Professor Liqiu Wang, were awarded in the "Zhejiang Recruitment Program of Global Experts (1000 Talents Plan)" Program (浙江省千人計劃) in June 2013. So far, 18 papers written by the chief scientists and the teams of the three R&D Laboratories have been accepted for publication as journal articles or book chapters under the affiliation of HKU-ZIRI. It is expected that HKU-ZIRI will bid for more provincial and national funding schemes in the years to come.

22. Large numbers of individual researchers undertook collaborative projects during the report period with researchers in the PRC or elsewhere in the world across a wide range of activities, including joint research projects, co-authoring of papers, teaching or lecturing, providing consultancy or peer review services, supervising research students, and serving as external examiners.

23. The University has in place a number of initiatives to help increase research competitiveness and international collaboration. The application rounds during the reporting period are detailed below.

(a) *Visiting Research Professors Scheme*

The Visiting Research Professors Scheme (VRPS) has attracted 38 leading scholars from around the world since its inception in 2009. This year, 11 nominations were received, and 8 awards were made to prominent professors from, inter alia, King's College London, the University of Washington, Beijing Genome Institute, the University of North Texas, and the University of Southern California. The mid-term/final reports on VRP appointments received from Faculties demonstrated the VRPs' valuable contributions, particularly in enhancing the research profile and international collaborations of Faculties through co-authoring papers and collaborating in projects, giving feedback on research proposals, and strengthening/developing links between HKU and their host institutions.

To allow more comprehensive review of nominations submitted under the Distinguished Visiting Scholars Scheme (DVSS) and the VRPS, the application and selection cycle of the two schemes are now synchronised. In 2013, three distinguished scholars were selected under the DVSS Scheme.

(b) *King's/HKU Fellowships*

HKU and King's College London launched reciprocal King's/HKU

Fellowships to strengthen their partnership by enabling their academic staff members to visit the partner institution. In the reporting period, 3 HKU members visited King's. In the latest application round, 5 Fellowships were awarded to HKU staff who will visit King's within the academic year 2013–14.

(c) *HKU Overseas Fellowships*

HKU established the Overseas Fellowship awards to support academic staff members to visit overseas institutions over a period of one to two months for research collaborations. In 2012–13, 5 HKU staff visited overseas universities—including the University of Oxford, the University of California, Berkeley, and the Maastricht University Medical Centre—while 6 awards were freshly given to support 6 HKU staff to visit overseas institutions within the 2013–14 academic year.

(d) *Doris Zimmern HKU-Cambridge Hughes Hall Fellowship*

To forge closer ties, and foster cultural exchange and academic excellence, between HKU and Hughes Hall, University of Cambridge, HKU offers co-funding alongside the Doris Zimmern Charitable Foundation to enable teaching and research staff of the University to spend a period of time at Hughes Hall, as visiting fellows, for research collaboration and other academic exchange. The cost of the accommodation and a pro-rata College fee in respect of individual fellows is covered by the University. Since its inception in 2009, 35 HKU members have been awarded the Fellowships to reside at Hughes Hall for research collaboration and academic exchange, and 12 of them paid their visits within the academic year 2012–13

### **3. University–Industry Partnership**

24. The commercialisation of its intellectual property through technology transfer is encouraged by HKU, as the practical application of technological advances benefits both the University and the community as a whole. The Technology Transfer Office (TTO), established in 2006, carries out technology transfer, legal, and liaison operations, while commercial operations come under Versitech, a wholly-owned subsidiary of HKU.

25. TTO continues to strengthen professional capabilities in technology transfer in support of the University's mission of knowledge exchange. In the past reporting year, TTO has organised the following training courses and events:

(a) Entrepreneurship Academy

TTO re-run the Entrepreneurship Academy in 2012–13. An eight-week workshop series in Entrepreneurship was organised for research staff, RPg students and alumni of related postgraduate programmes of the University. The invited speakers were either seasoned practitioners or academics specialising in entrepreneurship. This year, a total of 35 participants attended all the eight sessions of the workshop. The sessions also provided plenty of networking opportunities for the speakers and participants. In

addition to the workshops, visits to CoCoon (an open co-working space for entrepreneurs that enables them to interact and get access to complementary partners) and HKFYG's Media 21 were arranged for participants.

(b) Business of Intellectual Property Asia Forum (BIP Asia) 2012

TTO was one of the supporting organisations of BIP Asia 2012, which was held in Hong Kong on December 7, 2012. This was a prominent event jointly organised by the Hong Kong Trade Development Council and the Hong Kong Design Centre, with support from the Intellectual Property Department of the HKSAR Government. The event attracted over 1,000 local and overseas participants joining in panel discussions and sessions, with topics ranging from trademarks and licensing to the latest software copyright trends, and intellectual property in biotechnology and traditional Chinese medicine. TTO took the opportunity to set up a consultation booth at the Forum to showcase technologies developed by HKU that are available for licensing.

(c) FICPI South East Asian Drafting (SEAD) Training Course

To promote awareness in intellectual property protection and provide training in patent drafting to technology transfer professionals, researchers and patent administrators in Hong Kong, TTO brought the training course on patent drafting developed by The Fédération Internationale des Conseils en Propriété Industrielle (FICPI; 'International Federation of Intellectual Property Attorneys' in English) to Hong Kong in 2010. The South East Asian Drafting (SEAD) Training Course, jointly organised by TTO and FICPI, was offered for one final session in November 2012. Over the past three years, a total of 78 participants from Hong Kong, Mainland China, Taiwan and South East Asia have attended the course. FICPI will introduce the course to Malaysia in 2013.

26. A number of examples of successful university-industry partnership took place during the report period. Versitech Ltd undertook a total of 13 contract research projects within 2012–13 with various industrial sectors. As of 2012–13, Versitech Ltd has licensed a cumulative total of 109 inventions and know-hows to industry, representing 36.9% of all the University's inventions and know-hows. The Faculty of Engineering has licensed 56.4% of its inventions and know-hows, the Faculty of Science has licensed 38.4%, the Faculty of Architecture has licensed 20.0%, and the Medical faculty has licensed 22.4%

#### **4. Knowledge Exchange**

27. HKU is strongly committed to building knowledge exchange (KE) into the culture of the University. The HKU Strategic Development Plan 2009–14 explicitly recognises knowledge exchange as one of the three pillars underpinning all of the University's activities, and one of the University Research Committee's five strategies is "to encourage knowledge transfer to community and society". Since 2009, the University has put in place infrastructure to support KE, including a Knowledge Exchange Office and counterpart units within each faculty. KE activities are reported to UGC annually. Some highlights from the 2012/13

reporting year include the following:

- (a) *Embedding KE in the HKU culture:* The Faculty KE Award Scheme, launched in 2011, aims to recognise each Faculty's outstanding KE accomplishment that has made demonstrable economic, social or cultural impacts to benefit the community, business/industry, or partner organisations. From 2012–13, KE Awards are presented at the University's annual Award Presentation Ceremony for Excellence, alongside the long established awards for Teaching and Research. Other KE activities, such as monthly KE lunchtime seminars and the HKU Three Minute Thesis (3MT<sup>®</sup>) Competition, have become regular events in the University calendar and are always well attended. KE performance and plans are now featured in the annual Faculty Development Plan exercise, alongside Teaching and Research.
- (b) *Making knowledge accessible:* The HKU Scholars Hub (<http://hub.hku.hk/>) is the institutional repository of the University. The Hub has made HKU researchers and their research highly visible, with a significant increase in view and download counts. For example, the view count of the HKU ResearcherPages has increased from 349,741 by the end of June 2011 to 1,057,201 by the end of June 2013. In addition, an increasing number of academic staff members have made use of web technologies to share their knowledge and expertise, designing KE websites to meet unmet knowledge needs.
- (c) *Engaging the community:* A new Partnerships webpage ([www.ke.hku.hk/eng/links/partnerships](http://www.ke.hku.hk/eng/links/partnerships)) has been built, which links external organisations to the various online resources of the University to explore opportunities of working with our students through internships or student projects and to search for our researchers for potential collaboration. Community and cultural engagement has firmly become an on-going commitment of the University. Such activities have become embedded in the annual plan of our Faculties and include public lectures, summer institutes and continuing professional development programmes.
- (d) *Broadening KE opportunities:* The University's Competitive Impact Project Funding Scheme uses UGC Knowledge Transfer funding to provide support to academic staff to undertake innovative projects that have the potential to create social, economic, environmental or cultural impacts for industry, business or the community. In 2012–13, 57 proposals were received, of which 39 were supported. The Student KE Project Grant Scheme, piloted in 2011–12, was continued in the reporting year to encourage students to undertake KE projects. 27 proposals were received, of which 18 were supported.

## 5. Undergraduate Research

28. The Undergraduate Research Fellowship Programme (URFP), launched in 2011, started a second round in September 2012. The Programme aims to enhance the learning experience of undergraduate students and to nurture the next generation of researchers/scholars through providing opportunities for students to undertake research study under the guidance and supervision of academics who have a strong research track record



and experience in training research postgraduate students. In the first exercise, 56 academically outstanding undergraduate students successfully completed the programme in the URFP 2012–13, 36 of whom were granted awards and successfully completed internships locally, in the Mainland or overseas. For the second round, 65 students were selected for enrolment in the URFP 2013–14, of which 27 were granted awards for undertaking internships locally or overseas. These students are expected to complete their research study within the academic year 2013–14.

## 6. Research Highlights

29. A number of research highlights in 2012–13 are listed below:

### *Theme-based Research Scheme (TRS)*

30. The RGC has awarded funding to a total of 14 projects in the past 3 rounds of the Theme-based Research Scheme (TRS), which was introduced in 2010–11 to support themes of strategic importance to the long-term development of Hong Kong. HKU is the co-ordinating institution of 6 awarded projects, which received total funding of \$269 million, with HKU researchers also involved in a further 6 projects. In July 2013, in the 3<sup>rd</sup> round of TRS, RGC awarded funding to 3 projects, of which 2 include HKU as a participating institution.

### *Areas of Excellence (AoE)*

31. Since its inception in 1997, the Areas of Excellence (AoE) scheme has provided support for 18 projects over 6 funding rounds to nurture areas of international excellence through high-quality research and inter-institutional collaboration. Of these 18 AoE projects, HKU is the co-ordinating institution of 8 projects, representing total funding of \$605 million. HKU is also participating in a further 6 that are co-ordinated by other institutions, including a project awarded in the 6<sup>th</sup> round in July 2013.

### *2013–14 GRF Exercise / ECS*

32. In the 2013–14 General Research Fund (GRF) exercise, HKU again received the largest share of the funding (now for sixteen of the last seventeen exercises). HKU Principal Investigators secured a quarter of the total number of projects supported. Of the 587 applications submitted by HKU in this round, 218 were approved, representing a success rate of 37.1%. As with last year, the University received the largest amount of funds for projects under the Humanities and Social Sciences Panel and the Biology and Medicine Panel. HKU was awarded HK\$143.483 million out of HK\$560.626 million (excluding on-costs).

33. In the latest funding round of the Early Career Scheme (ECS) (2013–14), a total of 149 projects were supported by RGC. The University submitted 61 applications, of which 27 were approved securing HK\$20.329 million in funding (excluding on-costs).

*SPPR 2012–13*

34. Both of the funded projects in the latest funding round of the Strategic Public Policy Research (SPPR) scheme (2012–13 exercise) were awarded to HKU, with a total of HK\$4.78 million in funding:

- (a) ‘Social integration of children born in Hong Kong to Mainland women: A study of long-term implications on education, health and social services’, Principal Investigator: Dr E.K.L. Chan (Department of Social Work and Social Administration); and
- (b) ‘An Integrated Study of the Population Policy for Hong Kong’, Principal Investigator: Professor P.S.F. Yip (Department of Social Work and Social Administration).

*2012–13 CRF Exercise*

35. In the 2012–13 round of the RGC’s Collaborative Research Fund (CRF), HKU is lead institution of 3 of the 12 projects funded and participating in a further 8 projects as a collaborating institution. The following 3 projects are those for which HKU is the lead institution:

- (a) ‘To Establish a Metabolic Study Centre in Hong Kong: Focusing on the Emerging Metabolic Hormones’, HK\$8 million\*, Project Coordinator: Professor K.S.L. Lam (Department of Medicine), in collaboration with CUHK;
- (b) ‘Ecology and biodiversity of benthic marine ecosystems before and after the trawling ban in Hong Kong coastal waters’, HK\$7.3 million\*, Project Coordinator: Professor K.M.Y. Leung (School of Biological Sciences), in collaboration with CityU, HKBU, CUHK and PolyU; and
- (c) ‘Ventilation of a High-Rise Compact City’, HK\$5 million\*, Project Coordinator: Professor Y. Li (Department of Mechanical Engineering), in collaboration with PolyU.

\* excluding on-costs

*Humanities and Social Sciences Prestigious Fellowship Scheme (HSSPFS)*

36. In the 2013–14 funding round of the Humanities and Social Sciences Prestigious Fellowship Scheme, of the 8 applications funded HKU received the largest share, with 2 successful projects awarded a total of HK\$1.32 million:

- (a) ‘Art in twentieth-century China’, Principal Investigator: Professor D.J. Clarke (School of Humanities); and
- (b) ‘The neuroplastic effect of meditation on attention and emotion’, Principal Investigator: Professor T.M.C. Lee (Department of Psychology).

*NSFC/RGC Joint Research Scheme*

37. Under the National Natural Science Foundation of China/Research Grants Council (NSFC/RGC) Joint Research Scheme, in 2012–13 funding of HK\$21.25 million was awarded to 23 projects from six UGC-funded institutions. HKU submitted 47 initial applications, of which 11 were shortlisted and 6 funded. It received funding of HK\$6.1 million, representing about a quarter of the total allocation.

*ANR/RGC Joint Research Scheme*

38. The French National Research Agency and the Research Grants Council Joint Research Scheme (ANR/RGC)—introduced for the first time in this reporting period—aims to strengthen the collaboration between French and Hong Kong research communities in areas of mutual interest to be jointly identified in order to achieve world-class scientific and technical results, leading towards new knowledge. In total 4 applications were funded by RGC, and HKU secured the largest share of projects and funding, with 2 successful projects awarded a total of HK\$4.92 million in funding.

*SRFDP/RGC ERG Joint Research Scheme*

39. In the newly introduced Specialized Research Fund for the Doctoral Program of Higher Education and RGC Earmarked Research Grants Joint Research Scheme (SRFDP/RGC ERG), which aims to promote collaboration between researchers and PhD students in Hong Kong and institutions supported by the SRFDP under the Centre for Science and Technology Development of the Ministry of Education, HKU received a total of HK\$1.093 million for 3 awarded projects.

*Partner State Key Laboratories*

40. In July 2013, the State Ministry of Science and Technology (MOST) supported the establishment at the University of a new Partner State Key Laboratory (Partner SKL) of Pharmaceutical Biotechnology in strategic collaboration with Nanjing University. This Partner SKL, whose Director is Professor A. Xu, Department of Medicine, aims to conduct basic, clinical and translational research on obesity, diabetes and its cardiovascular complications. It will serve as a key platform to strengthen collaborations and academic exchanges with the Mainland and international scientists, to train young researchers, and to support the pharmaceutical industries as well as clinical practice in Hong Kong and mainland China. HKU now has 5 Partner SKLs, the most of any local institution.

*National Key Basic Research Development Program (973 Program)*

41. The National Key Basic Research Development Program (973 Program) of the Ministry of Science and Technology of the People's Republic of China (MOST) aims to strengthen basic research in line with national strategic targets. Since 2011, members of the HKU–Shenzhen Institute of Research and Innovation (HKU–SIRI) have been eligible to apply for funding through the 973 Program. During the reporting year, funding totalling RMB16 million was obtained for two projects under this program:

- (a) “Excited States of Metal Complexes: Basic and Practical Researches”, Chief Scientist: Professor C.M. Che (Department of Chemistry); and
- (b) “Studies on several natural products of their syntheses, target identification and mechanism”, Project Leader: Dr. X.C. Li (Department of Chemistry)

*National Natural Science Fund— National Natural Science Foundation of China (NSFC)*

42. HKU-SIRI members are also eligible to apply for funding through the National Natural Science Fund of the National Natural Science Foundation of China (NSFC). In the reporting year, HKU-SIRI received total funding of RMB20 million for 32 projects under NSFC.

*Innovation Technology Support Programme (ITSP)*

43. Since the introduction of the Innovation and Technology Fund’s Innovation Technology Support Programme (ITSP) in 1999, the University has had 142 projects approved from 1999 (up to the end of June 2013). This represents 21% of the 688 projects approved under ITSP. The total funding granted to HKU for these projects is \$388.05 million.

*Health and Medical Research Fund*

44. The Health and Medical Research Fund (HMRF), created in December 2011, consolidates the former Health and Health Services Research Fund (HHSRF) and the Research Fund for Infectious Diseases (RFCID). In the 2012–13 HMRF funding round, HKU has had 54 projects approved (up to mid-October 2013), with total funding granted of \$42.86 million.

*Croucher Foundation ASIs*

45. The Croucher Foundation sponsors a number of Advanced Study Institutes (ASIs) each year to enable experts in a particular field to meet and conduct advanced tuition on a defined topic.

46. An ASI on “Stem cells: Niches, Regeneration & Repair” took place on March 4–8, 2013. It was organised by Professor K.S.E. Cheah (Department of Biochemistry) with funding of \$600,000.

47. In April 2013, a grant of HK\$590,000 was awarded to the University for an ASI on “Chemical Biology”, by Professor D. Yang (Department of Chemistry), scheduled to be held in December 2013.

*Croucher Foundation Sponsorship of Conferences, Workshops and Symposia*

48. Sponsorship is also provided by the Croucher Foundation for international

conferences and seminars in the fields of natural science, technology or medicine. Such events must be of direct benefit to Hong Kong, and preferably have a strong research emphasis. Two conferences sponsored in this way were organised by HKU researchers during the report period:

- (a) November 26–27, 2012, Hong Kong Society for Developmental Biology Symposium – From Embryology to Disease Mechanisms, by Professor K.S.E. Cheah (Department of Biochemistry) with funding of HK\$100,000; and
- (b) June 14, 2013, Molecular Mechanisms of Innate Immunity, by Professor D. Jin (Department of Biochemistry) with funding of HK\$100,000.

49. The Croucher Foundation also approved sponsorship grants during the report period of HK\$100,000 each for the following events:

- (a) 9th Pan Pacific Connective Tissue Societies Symposium – The extracellular matrix niche, by Dr. D. Chan (Department of Biochemistry), to be held on November 24–27, 2013;
- (b) Advances in live cell and intravital imaging in biomedicine, by Professor G.S.W. Tsao (Department of Anatomy), to be held in November 2013; and
- (c) International Food Safety Conference – From Experience to Perspectives, by Dr. H.S. El-Nezami (School of Biological Sciences), to be held on May 26–28, 2014.

#### *Croucher Summer Courses*

50. To educate and inspire promising postgraduate students and early career researchers from Hong Kong and the wider region, funding is provided for summer courses in a particular field of natural sciences, technology and medicine. Under this scheme, the summer course on “Cancer Biology”, led by Professor I.O.L. Ng (Department of Pathology) and co-directed by Professor T.W. Mak (University of Toronto), has been awarded HK\$600,000, to be held once every two years over a six-year period.

#### *Croucher Innovation Awards*

51. The Croucher Foundation set up a new award in 2012 to offer substantial support to a small number of exceptionally talented scientists at a formative stage in their careers, in order to enable them to pursue their own scientific, intellectual and professional inclinations. The two awards of the first exercise were both granted to HKU researchers. Dr. W. Yao (Department of Physics) and Dr. H.K.H. So (Department of Electrical and Electronic Engineering) were awarded HK\$5 million each over a 5-year period for their research.

#### *HK Scholars Program*

52. In the third round of the Hong Kong Scholars Program, six HKU researchers were

selected to supervise postdoctoral fellows (PDFs) for a period of two years. This cross-border initiative—introduced by the Society of Hong Kong Scholars and the Office of the National Administrative Committee of Postdoctoral Researchers under the Ministry of Human Resources and Social Security—aims to nurture outstanding PDFs from the Mainland in Hong Kong.

#### *External Academic Honours*

53. The University has a proud record of academic recognition. HKU has been awarded more Croucher Foundation Senior Research Fellowships (40 out of a total of 94 fellowships awarded since 1997, including Senior Medical Research Fellowships) than any other local institution.

54. A number of important academic awards and honours have been bestowed on HKU researchers over the reporting period including the following examples:

- (a) Professor S. Kwok, Dean of Science and Chair Professor of Physics, was elected Vice-President of the International Astronomical Union (IAU) Bioastronomy Commission. He will help the Union to organise worldwide research and education activities including conferences. Professor Kwok was also elected as a fellow of the American Association for the Advancement of Science (AAAS).
- (b) Professor P.K.H. Tam, Pro-Vice-Chancellor and Vice-President (Research) and Chair of Paediatric Surgery, was elected as an Honorary Fellow of the American Surgical Association (ASA), the oldest surgical association in the US. The ASA's Honorary Fellowship is awarded to outstanding non-US surgeons for their contributions in the field of surgery throughout the years.
- (c) Professor A.G.O. Yeh, Head and Professor of the Department of Urban Planning and Design, was honoured with the 2012 Dr Gill-Chin Lim Global Award in recognition of his global leadership as a scholar and an educator and his contributions in the advancement of humanistic globalisation.
- (d) Dr. K.W. Fung, Associate Professor of the School of Chinese and Honorary Associate Professor of the Hong Kong Institute for the Humanities and Social Sciences, was conferred the Sixth Zhu Kezhen History of Science Visiting Research Professorship by the Chinese Academy of Sciences (CAS). Dr. Fung's tenure at CAS ran from October 2012 to March 2013.
- (e) Professor R.S.Y. Hui, Philip KH Wong Wilson KL Wong Professor in Electrical Engineering of the Department of Electrical and Electronic Engineering, was awarded a Croucher Senior Research Fellowship 2013/14, and Professor I.O.L. Ng, Chair Professor and Head of Department of Pathology of the Li Ka Shing Faculty of Medicine, was awarded a Croucher Senior Medical Research Fellowship 2013/14.
- (f) Professor C.M. Che, Dr Hui Wai-Haan Chair of Chemistry, was elected as a Foreign Associate of the National Academy of Sciences (NAS), United

States, in recognition of his distinguished and continuing achievements in original research. The NAS, a private, non-profit society of distinguished scholars that was established in 1863, has approximately 2,200 members and 400 foreign associates.

- (g) Professor Lap-Chee Tsui, Vice-Chancellor, was conferred honorary doctorate degrees from Fudan University of Shanghai in 19 May 2013 and Western University (The University of Western Ontario) of Canada on May 19 and 26, 2013 respectively, in recognition of his achievements in scientific research, in particular in the study of the human genome.

#### *Outstanding Researcher Award Scheme*

55. The annual internal awards for research excellence enable the University to give recognition to the outstanding performance of its researchers. At a ceremony on March 27, 2013, the following awards, for research achievements during and prior to the report period, were presented:

(i) *Outstanding Researcher Award*

Professor G.K.Y. Chan (Department of Chemistry)  
Professor X. Guan (Department of Clinical Oncology)

(ii) *Outstanding Young Researcher Award*

Dr. C.K. Cheng (Department of Computer Science)  
Dr. J.J. Wang (Department of Biochemistry)  
Dr. M. Wang (School of Biological Sciences)  
Dr. Y. Zhao (Department of Law)

(iii) *Outstanding Research Student Supervisor Award*

Professor A.N.Y. Cheung (Department of Pathology)  
Dr. J. Huang (Department of Biochemistry)  
Mr. S.S.Y. Lau (Department of Architecture)

56. The HKU Research Output Prize—included in the Outstanding Researcher Award Scheme since 2005—aims to reward the authors of outstanding individual publications such as refereed journal papers, books, or CD-ROMs. Individual Faculties select an output item for the prize, and they can determine the research output form that best represents their research achievement. Ten Research Output Prizes were awarded at the ceremony in March 2013 for the following research output items:

Faculty of Architecture: ‘Intraurban Location of Producer Services in Guangzhou, China’, *Environment and Planning A*, 2011, Vol.43, No.1, pp. 28-47, by Hong Yi, Fiona F Yang, Anthony G O Yeh

Faculty of Arts: *Strangers on the Western Front: Chinese Workers in the Great War*, London: Harvard University Press, 2011, 366pp, by Xu Guoqi

Faculty of Business and Economics: ‘Intellectual Capital and Financing Decisions: Evidence from the U.S. Patent Data’, *Management Science*, October 2011, Vol. 57, No. 10, pp.1861-1878, by Qiao Liu, Kit Pong Wong

Faculty of Dentistry: ‘Structural and functional insight into the mechanism of an alkaline exonuclease from *Laribacter hongkongensis*’, *Nucleic Acids Research*, 2011, Vol. 39, No. 22, pp. 9803-9819, by Wen Yang, Wen-yang Chen, Hui Wang, John W.S. Ho, Jian-Dong Huang, Patrick C.Y. Woo, Susanna K.P. Lau, Kwok-Yung Yuen\*, Qionglin Zhang, Weihong Zhou, Mark Bartlam, Rory M. Watt, Zihao Rao

Faculty of Education: *Citizenship and Citizenship Education in a Global Age: Politics, Policies, and Practices in China*, New York: Peter Lang Publishing, 2011, 259pp, by Wing-Wah Law

Faculty of Engineering: ‘Clock Synchronization of Wireless Sensor Networks’, *IEEE Signal Processing Magazine*, January 2011, Vol.28, No.1, pp. 124-138, by Yik-Chung Wu, Qasim Chaudhari, Erchin Serpedin

Faculty of Law: *Resolving Disputes in the Asia-Pacific Region: International Arbitration and Mediation in East Asia and the West*, Abingdon, Oxon: Routledge, 2011, 146pp, by Shahla F. Ali

Li Ka Shing Faculty of Medicine: ‘Long-term evolution and transmission dynamics of swine influenza A virus’, *Nature*, 26 May 2011, Vol. 473, Issue 7348, pp. 519-522, by Dhanasekaran Vijaykrishna, Gavin J.D. Smith, Oliver G. Pybus, Huachen Zhu, Samir Bhatt, Leo L.M. Poon, Steven Riley, Justin Bahl, Siu K. Ma, Chung L. Cheung, Ranawaka A.P.M. Perera, Honglin Chen, Kennedy F. Shortridge, Richard J. Webby, Robert G. Webster, Yi Guan, J.S. Malik Peiris

Faculty of Science: *Dirichlet and Related Distributions: Theory, Methods and Applications*, Chichester, West Sussex: Wiley, 2011, 310pp, by Kai Wang Ng, Guo-Liang Tian, Man-Lai Tang

Faculty of Social Sciences: ‘The Causality Analysis of Climate Change and Large-scale Human Crisis’, *Proceedings of the National Academy of Sciences of the United States of America*, October 18, 2011, Vol. 108, No.42, pp. 17296-17301, by David D. Zhang, Harry F. Lee, Cong Wang, Baosheng Li, Qing Pei, Jane Zhang, Yulun An

### *Major International Research Events*

57. A variety of important international research conferences were organised by HKU during the 2012–13 report period, including the following:

- (a) December 6–8, 2012—An International Conference on “Philanthropy, the State and Globalisation”, organised by HKU’s Hong Kong Institute for the Humanities and Social Sciences, focused on comparing local, indigenous charities to their foreign counterparts, those having been brought into a particular community from a greater region or internationally. Charitable operations and experiences from many corners of Asia and Africa were examined.
- (b) March 9–10, 2013—the Eighth International Symposium on Healthy Aging, “How to Age with Finesse”, was organised by the Research Centre of Heart, Brain, Hormone and Healthy Aging. It focused on the promotion of healthy aging from a multidisciplinary perspective and provided updates on the development of novel therapeutic as well as diagnostic approaches against aging-related problems.



- (c) June 17–21, 2013—the 7th International Conference on Marine Pollution and Ecotoxicology, supported and sponsored by the United Nations, was attended by about 250 scientists and environmental managers from 24 countries. The aim was to discuss and advance the understanding of local, regional and global marine pollution problems.
- (d) October 29–31, 2012—the 2012 International Conference on Information and Communications Security brought together individuals involved in multiple disciplines of information and communications security in order to foster the exchange of ideas. The conference was co-organised by the Center for Information Security and Cryptography, HKU's Department of Computer Science and the Institute of Software Chinese Academy of Sciences.

### *Published Research*

58. HKU has an excellent record of published research, both in discipline-specific journals and in more high-profile publications such as *Science*, *Nature*, and *The Lancet*. The University has the highest number of refereed publications, both in absolute terms and expressed as a ratio of publications per staff member, of any UGC-funded institution. For 2011–12 (the latest available statistics; see the CDCF data mart website) HKU had 5,901 peer-reviewed refereed publications.

59. The University does particularly well in scientific publications. According to statistics published by Thomson Reuters, there were a total of 331,086 citations of 24,061 HKU papers in journals tracked by Thomson Reuters between January 2003 and June 2013. This was the highest number of citations of any UGC-funded institution. In 2012 the University had 3,535 publications in journals tracked by Thomson Reuters, again more than any other UGC-funded institution. Thomson Reuters also ranked 125 HKU professoriate staff among the world's top 1% of scientists.

### *Patents*

60. Since 1998, the University has filed 1277 patents in various parts of the world, mostly in the United States (594), the European Union (193) and Greater China (191 in China, including Hong Kong, and 18 in Taiwan). Within the same period 353 patents were granted, 45% of which were in the United States (159). During the 2012–13 academic year, HKU filed 86 patents, and 33 patents were granted and 19 patent applications were abandoned.

### *Agreements/Legal Documents*

61. During 2012–13, HKU has handled 440 technology/knowledge transfer related agreements/legal documents—such as licensing, consultancy and materials transfer agreements—with counter signing parties mostly in Hong Kong (147), the People's Republic of China (102), North America (95.5) and the European Union (51.5).

### *Visit to HKU by New RGC Chairman*

62. Professor Benjamin Wah—Chairman of the Research Grants Council since January this year—visited HKU on March 26, 2013. He first met with the Pro-Vice-Chancellor

(Research) and some University Research Committee members to discuss research at HKU. An interactive session followed with more than 50 HKU academics, including Deans and Associate Deans, principle investigators and co-ordinators of major research projects, and research award winners. After being welcomed by the Vice-Chancellor, Professor Wah gave a brief presentation on three areas: funding sources for the RGC, the RGC structure and funding schemes, and other major ongoing issues. Most of the session was given over to discussion with the audience. Points raised included the distribution of on-costs, the use of quantitative metrics in the RAE, funding of future public policy research, collaborative research funding, international funding sources, the Early Career Scheme, and limitations on grant spending.