

Overview of Research Activities of The University of Hong Kong 2016–17

1. Institutional Policy on Research

1. At the core of the mission of the University of Hong Kong (HKU) is creating opportunities for excellence and impact in both research and innovation as well as to advance human knowledge for the benefit of society in Hong Kong, the wider region and the rest of the world. The University's vision for 2016–2025 to be **Asia's Global University** is underpinned by three pillars: teaching and learning, research and innovation, and knowledge exchange and impact. The realisation of this vision is based on (3+1)Is: Internationalisation, Innovation and Interdisciplinarity, which converge to create Impact.

2. HKU intends to undertake world-leading research in critical areas that leads to knowledge creation, translation, realisation and impact that can be benchmarked against the best institutions in the world. Its research policy provides the framework to strengthen capabilities in both fundamental and outcome-driven research as well as knowledge exchange in a culture that enables our researchers to flourish and create impact. The University emphasises innovative, high-impact and multidisciplinary research, and develops a research culture that enables quality research postgraduate (RPg) education and enriches career opportunities. It recognises full accountability for the effective management of public and private research resources, and embraces the opportunity to partner with the wider community to generate, disseminate and apply knowledge to create social, cultural and economic impact in the open innovation system.

3. HKU's research strategies and policies are formulated by the University Research Committee (URC), which is a committee of the Senate chaired by the Vice-President and Pro-Vice-Chancellor (Research) (VP(R)). In line with the University's vision, the URC has sharpened its strategies to further cultivate a supportive, dynamic environment in which staff and students can excel in research at an international level and realise their full potential in advancing, translating and transferring knowledge. The University aims to

- (a) Focus on research quality and impact, and the translational potential and value to industry, business and the community,
- (b) Raise competitiveness towards external funding and strategic partnership,
- (c) Foster outcome-based, cross-disciplinary and inter-institutional collaboration,
- (d) Promote social and technological innovation, entrepreneurial incubation and public-private partnership, and drive innovation and entrepreneurship through research and talent development,
- (e) Foster international and mainland China research collaboration, and
- (f) Build core capabilities for sustainable growth.

4. Over the past decade, the University used an initiative on Strategic Research Themes (SRTs)/Emerging SRTs (e-SRTs) to foster collaboration and focus. Launched in 2004 and completing its third cycle, the initiative aimed to identify strategic research areas and themes where interdisciplinary collaboration has the potential for important breakthroughs. It also served as a platform for nurturing interdisciplinary collaborative research projects to raise competitiveness for external research grants. To continue this aim of nurturing large-scale, cross-discipline projects, the scheme has evolved into a more sustainable Seed Funding for Strategic Interdisciplinary Research Scheme and the

Platform Technology Scheme (see below). Alongside this, the office of the VP(R), in consultation with the URC and other bodies, is also in the process of refining the key research areas and themes for future strategic development at the University.

5. Supporting these research strategies, the University continues to invest in the human resources that are necessary to sustain a research culture dedicated to excellence and impact. This includes developing a proactive human resource policy and management structure to, inter alia, facilitate academic recruitment and retention, recognise performance, and enhance diversity in international staff recruitment. Introduction of the specialist track in research in academic staffing last year was a clear example. HKU attracts outstanding staff from around the world, bringing with them international expertise. For example, in 2016–17 around 40% of professoriate staff were from overseas, 20% from mainland China and the remaining 40% from Hong Kong.

6. Within this broad strategic framework the University continues to encourage research excellence in a number of important focused areas. It continues to fund curiosity-driven research and to incubate new research initiatives with seed-funding grants. Emphasis is also increasingly placed on the impact of its research through the translation and application of its findings and through knowledge exchange and technology transfer. The University also continues, through its RPg 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 Interdisciplinary Research

8. To better support strategic interdisciplinary research, the URC decided to conclude the scheme on SRTs/e-SRTs and continue with development through a recurring seed funding scheme that helps the Faculties build knowledge and capabilities and raise the University's competitiveness for major external research grants/programmes. This new scheme enables academic staff to submit proposals in areas of emerging importance as well as more established areas, thus allowing the inclusion of those that were not in the SRT/e-SRT lists. At the same time, the office of the VP(R) is in the process of refining HKU's key research areas/themes for future strategic development. These help to ensure that the University is kept abreast of emerging areas of excellence in which HKU academics can impart a positive impact.

9. The SRTs/e-SRTs scheme ran at the University over three cycles and helped nurture relevant group projects, including the following large-scale projects awarded in the reporting year: an Areas of Excellence project on “Chemical Biology Approach to Molecular Medicine” related to the SRTs on Drug, Neuroscience, Cancer and Public Health; and a Theme-based Research Scheme project on “Translational Studies for Elucidating the Tumor Heterogeneity and Molecular Evolution in Metastatic Gastrointestinal Tract Cancers for Personalized Medicine” related to the SRTs on Cancer and Genomics.

10. The new Seed Funding for Strategic Interdisciplinary Research Scheme is used to groom large-scale external peer-reviewed research projects involving interdisciplinary collaboration – such as the Collaborative Research Fund, Areas of Excellence Scheme, Theme-based Research Scheme, Partner State Key Laboratories and overseas grants. Central funding is through the URC, with Faculties providing matching funding.

Platform Technology Funding

11. In May 2017, the URC launched a new funding scheme, namely Platform Technology Funding, which encourages and helps the HKU community develop platform technologies that can provide knowledge and capability bases upon which a range of programmes, projects and applications can be advanced and sustained. The primary drivers of these platforms are emerging cultural, social, technological and economic challenges. This is a major milestone in the history of the University in taking a defining step in building overarching platform technologies for a sustainable future.

Research Integrity

12. While pursuing excellence and impact in research, HKU intends to establish a culture among the university community of upholding research integrity. Promoting responsible academic conduct has therefore been made a top priority of the research management as it is the core value of the University.

13. Professor Frederick K.S. Leung has been appointed as the Director of Education and Development for Research Integrity since June 2011. His remit includes areas covering training and education for staff and students, as well as sharing the latest developments in research and good international practice. To strengthen the team, Professor Danny Chan has been appointed as the Deputy Director of Education and Development for Research Integrity since January 2015. The research ethics compliance continues to be handled by the relevant ethical approval bodies, namely the Human Research Ethics Committee, the Institutional Review Board of the University of Hong Kong/Hospital Authority Hong Kong West Cluster, and the Committee for the Use of Live Animals in Teaching and Research.

14. A number of ongoing and new initiatives are undertaken at HKU to promote responsible conduct of research (RCR). RCR seminars for staff are a regular event at the University, generally held once each semester. Since March 2010, more than 2,260 academics at all grades – from Post-doctoral Fellows to Chair Professors, including Heads of academic departments – have attended the 19 RCR seminars that have been organised. 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. This mandatory requirement was extended in February 2015 to existing staff who joined the University before July 2012; they had to attend an RCR seminar by June 30, 2017. During the reporting year, the RCR seminars were held in November 2016 and May 2017.

15. Other measures at the University to promote research integrity include a compulsory research ethics course for RPg students, online RCR materials for self-education, and active participation in research integrity networks. 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. A total of 23 proposals were funded in the past five rounds.

16. A key event during the reporting year was the Asian and Pacific Rim Research Integrity (APRI) Network Meeting 2017 in HKU over three days in February 2017. This was the first APRI network meeting held in Asia, and more than 100 delegates from across

the region attended the event. The meeting was held in Hong Kong and co-hosted by HKU and the University of California, San Diego, with generous support from the Croucher Foundation and the US Office of Research Integrity. APRI seeks to foster research integrity (RI) through multinational awareness, understanding and opportunities for collaboration. The Network first met in the US in February 2016. HKU was proposed as the meeting host because of its widely acknowledged commitment to promoting RI, as well as its easy accessibility from many countries in the region. Participants came from Australia, Bhutan, Cambodia, Canada, mainland China, Hong Kong, India, Indonesia, Japan, Malaysia, Nepal, Pakistan, the Philippines, Singapore, South Korea, Sri Lanka, Taiwan, Thailand, and the USA. The meeting had 4 key objectives: articulate differences as well as areas of common ground, identify best or recommended practices, identify opportunities for research collaboration, and set an APRI network agenda for the coming years. To meet these objectives, 7 plenary and 4 break-out discussion sessions were held, as well as numerous opportunities for informal chats. Topics discussed included definitions of terms, issues faced, good practices, teaching about RI, institutional mechanisms, cross-border misconduct, regional collaboration, and the future of APRI. Participants valued the emergence of the Network, particularly as a facilitating body and resource hub, and suggested initiatives such as sharing materials and expertise, developing a website, and fostering deeper collaboration in research in RI. The group will convene again next year.

17. The University has been supporting staff and research students to attend World Conferences on Research Integrity since 2010. This is the largest international conference in RI, attracting more than 800 participants from all over the world to attend including researchers, teachers, funding agencies, publishers, government officials and senior university administrators. At the 5th World Conference on Research Integrity in May 2017 in Amsterdam, and upon the invitation of the steering committee, HKU successfully secured the right to co-host (with RMIT, Melbourne, Australia) the 6th world conference in 2019. More participants in Hong Kong, mainland China and nearby countries can be expected to attend the next world conference to learn about the best global research practices.

Preparations for the Next Research Assessment Exercise (RAE)

18. In preparation for the Hong Kong-wide assessment of research by the University Grants Committee (“RAE 2020”), HKU undertook a mock exercise in 2017 with the objective of self-assessment and improvement. A Small Group was set up under the URC to oversee the exercise. The aims of the exercise were to (i) give some indication of how the University stood today as compared with the last RAE in 2014, (ii) help follow-up actions and plans to sustain effort in areas of strengths and improve in areas with shortcomings, (iii) focus on both the quality and impact of the research, and (iv) raise the awareness of and readiness for RAE 2020. The exercise was coordinated with faculty-based assessments, and appropriate experts with relevant experience were engaged in the review process to adopt a stringent approach and have a good reflection of the current strengths/weaknesses. Faculties have been asked to review both research outputs and impact case studies.

19. An HKU Research Management Colloquium was held on November 7, 2016. The Colloquium – attended by some Senior Management Team members, Faculty Deans and Heads of Departments, and representatives from sister institutions – included a presentation by a prominent UK professor on the UK Research Excellence Framework

(REF), followed by an experience-sharing session on the RAE in HK.

2017 Research Management Colloquium – Citations, Impact & International Ranking

20. HKU, in partnership with Elsevier, hosted an international colloquium on popular topics related to citations, impact and international ranking on May 12, 2017, providing a forum for critical discussion of developments, challenges and potential solutions in higher education. Attracting some 200 participants from Hong Kong, mainland China, Asia, Europe and North America, the colloquium is part of a series aimed at generating dialogue and progress in key areas affecting international research communities.

Follow up on the RGC Visit to HKU in 2016

21. Following the RGC's Visit to HKU on June 16, 2016, the RGC Chairman wrote to the University in October 2016 commenting that the visitors "were impressed with the excellent and world-leading research activities and advanced laboratory facilities". They "appreciated HKU's strong emphasis in inter-disciplinary collaboration" and noted that "the collaborative research results were extraordinary". Members met with "high morale faculty members" and "were impressed to meet with HKU's highly intellectual and multicultural research postgraduate students and fascinated by their enthusiasm towards research work".

22. The RGC message was disseminated to Faculties and other relevant units for feedback and proposed follow-up actions, which were discussed at the URC. The URC is using various existing and new schemes to encourage cross-disciplinary research, to provide seed funding for staff in basic, translational and applied research, and to support the acquisition of small-to-medium but essential equipment. The VP(R) and his management and administrative team also conducted annual faculty visits to meet the Dean and his/her management team to explain policies, discuss topics of common interest and improve communication. The VP(R) also gave seminars to staff, particularly new and young staff, on the research demands and expectations.

Research Data and Records Management Policy

23. In recent decades, measures to tackle the challenge of effectively managing growing amounts of research data have been introduced overseas, for example in the UK and the USA. Although Hong Kong currently has no mandatory requirement in place, HKU acknowledges its responsibility to manage and safeguard research data, and it is implementing a requirement in view of the increasing emphasis on proper data management as part of responsible research conduct. The University's Policy on the Management of Research Data and Records (<http://www.rss.hku.hk/integrity/research-data-records-management>) was approved by the Senate in May, 2015, along with the establishment of a Task Force on Management of Research Data and Records to oversee the planning of the implementation of the Policy. According to the Policy, researchers are responsible for, among other things, planning for the ongoing custodianship of their research data.

24. HKU has now prepared a platform, through the Libraries, for depositing public and restricted research data through the HKU Scholars Hub, and researchers are being encouraged to make use of this new infrastructure for depositing their research data. Difficulties are expected in the implementation, including establishing such culture among

staff and the anticipated diversity of data that will be deposited. The Task Force has prepared a data management plan template (to be adapted for different types of data) and funding will be provided for the Libraries for infrastructure and training materials. Libraries and the Graduate School will also incorporate such a training component into their workshops and courses. Principal Investigators of external research grants from the Research Grants Council, Food and Health Bureau, Education Bureau and Innovation and Technology Commission that are administered by Research Services with funds released from July 2018 onwards are required to submit a Data Management Plan together with any revised budget before the funding can be spent for all projects that involve the collection, generation or use of research data. They are also required to submit additional information and deposit the raw data for these projects before final reporting. Research postgraduate students registering in September 2017 and thereafter are required to submit a data management plan before the expiry of their probationary period and a dataset of their research, where applicable, at the time of thesis submission for examination.

Small Equipment Grant

25. As part of the efforts of the URC to further strengthen the infrastructure support for research, a new funding scheme, namely the Small Equipment Grant, was introduced in the reporting year. Faculties and Departments were invited to bid for co-funding for small but key equipment that will serve strategic needs and research initiatives of the Faculties. The funding programme complements other existing schemes, such as the Equipment Grant under the RGC Collaborative Research Fund, which supports the purchase of major equipment.

2. Collaborative Research

26. Collaboration in research at a wide range of levels is highly valued by the University's management and by individual researchers. Research across disciplines at HKU is actively encouraged, for example through the new Seed Funding for Strategic Interdisciplinary Research Scheme. Other examples of initiatives at the University to stimulate cross-fertilisation include the Hong Kong Jockey Club Building for Interdisciplinary Research, which focusses on human research, particularly relating to human health and disease, bringing together research from Medicine, Science and Social Sciences. Cross-discipline research centres, such as the Centre for the Humanities and Medicine and the Law and Technology Centre, also aim to encourage productive relationships between fields. The University made available HK\$1.5 million to promote interdisciplinary collaborations in knowledge exchange (KE), with priority being given to cross-Faculty KE projects.

27. Researchers of the University are also heavily involved in large-scale collaborative projects with local institutions and international partners. For example, of the 56 Areas of Excellence (AoE) and Theme-based Research Scheme (TRS) projects awarded to date, HKU is co-ordinating 25 and participating in a further 23. Such projects thrive on interdisciplinary and international collaboration; for example, an AoE project on molecular functional materials brings together chemists, physicists and engineers for local and international collaborations, and a TRS project on enhancing Hong Kong's future as a leading international finance centre draws on the expertise of scholars from economics and finance, geography, law, and international relations.

28. Internationalisation through productive and strategic engagement in China, Asia and the rest of the world is a key feature that is embedded in many elements of the University's strategic plan. HKU has positioned itself to be a globally competitive, regionally engaging and locally impactful university, and in the face of the challenges ahead, the enhancement of collaboration with international and Mainland partners is highly valued. In addition to working closely with other local institutions, HKU actively participates in Universitas 21, a consortium of leading universities around the world dedicated to the internationalisation of higher education. The University is also a member of the Association of Pacific Rim Universities (APRU), a regional network of 45 world-class institutions. The VP(R) was appointed to be the convenor of the Research Leaders of APRU.

29. HKU also collaborates with a number of leading institutions, laboratories, pharmaceutical companies, research institutes and government bodies, both overseas and in mainland China. The University currently has 5 Partner State Key Laboratories (PSKLs) – the most of any Hong Kong institution – in the areas of Brain and Cognitive Sciences, Emerging Infectious Diseases, Liver Research, Synthetic Chemistry, and Pharmaceutical Biotechnology. The research at the PSKLs is integrated with mainland Chinese engagement strategies, and HKU's PSKLs are evolving as innovation hubs. A review of the PSKLs established in or before 2010 has been undertaken in 2017 by the Innovation and Technology Commission. As outlined below, partnership between the University and industry is also an ongoing focus to promote the application of research results.

30. Another form of international partnership by the University to enhance research collaboration is joint supervision of PhD students with prestigious overseas universities. To date, partners include King's College London, the University of Toronto, and the Southern University of Science and Technology. Through these initiatives, students have the opportunity to benefit from shared research excellence in a wide range of disciplines between HKU and its partners and to acquire enriching international experience. In addition, there are over 30 RPg student exchange partners in Europe, the USA, Southeast Asia, mainland China, etc. formed at the university level, along with many more at faculty and department levels.

31. In 2016, three projects led by PhD candidates from HKU and their supervisors received Universitas 21 Graduate Research Project Grants. The scheme was launched as a pilot in 2016 by Universitas 21 with the aim of enabling doctoral candidates to develop and implement international research collaborations within its network. The three projects involve collaborations with institutions in Australia, Canada, China, New Zealand, Singapore, the UK, and the USA.

32. The University has set targets for 50% of full-time RPg students to have at least one research experience overseas or in mainland China by 2019, and 100% by 2022. With an additional one-off fund from the UGC, an allocation from the URC and matching funding provided by Faculties, RPg students are supported to gain international exposure through various opportunities arranged by their Departments, supervisors and the students themselves.

33. New initiatives for international collaboration include the following examples:

- (a) HKU and University College London (UCL) have established a strategic partnership building on an extensive existing relationship. Agreements for further collaborations and exchanges were signed by the two parties on

October 31, 2016. 2016 was a banner year for the two institutions. In September, they welcomed the first cohort of Dual Degree students in Law (HKU-UCL Law Programme) marking a strategic collaborative relationship between the two premier law schools. In February, HKU President and Vice-Chancellor Professor Peter Mathieson led an HKU delegation to UCL to explore more opportunities for co-teaching programmes and research collaborations. More than 30 HKU current academic staff members were previously at UCL and more than 50 UCL academic staff visited HKU in the past five years. In 2015 alone, more than 130 research papers jointly co-authored by academics from the two universities were published. UCL has identified HKU as a key partner in the world.

- (b) HKU and Shanghai Jiao Tong University (SJTU) have formed a strategic partnership to bring new medicine to the public. The Presidents of the two institutions signed an agreement in January 2017 to establish a joint fund to support emerging areas of collaboration. Both institutions have a remarkable complementarity in several areas of research strength. The strategic partnership will advance research and education in many areas including drug discovery and development. An integral part of the partnership is the establishment of the HKU–SJTU Consortium on Translational Medicine, which will serve as a platform where the distinct strengths of each institution can be synergised and coordinated along the drug discovery and development continuum: from basic research to development to pre-clinical and clinical studies. The Hong Kong Science and Technology Park has committed to offer support for the development of the Consortium. As a kick-off event, a public Education Workshop was held in February 2017.
- (c) HKU entered into a partnership agreement with the National Academy of Medicine (NAM) in February 2017 to nurture future talents and to jointly tackle global challenges in Hong Kong and elsewhere. NAM is a world premier non-profit, non-governmental organisation that provides advice on issues relating to biomedical science and health to policy-makers, professionals, leaders, and the public in the US and around the world. Several collaboration projects have been established between HKU and NAM. These opportunities include (a) the first-ever HKU-NAM International Fellowship Program for mid-career HKU faculty staff to work in Washington DC; (b) the organisation of international roundtables and summits to tackle global health-related issues such as regenerative medicine, mental health, ageing, and gender equity; and (c) the contextualisation of NAM consensus studies that are of practical use for HK. The International Fellowship Program is intended to strengthen faculty research programmes and to enhance the development of new research, while creating opportunities for scholars to experience and participate in healthcare or public health studies that improve the care and access to care of patients in domestic and global health care systems.
- (d) To support Hong Kong's aspirations of becoming a financial technology (FinTech) hub, Professor D.W. Arner from HKU's Faculty of Law has joined forces with law professors from Europe and Australia to cooperate in researching the law and regulation of FinTech. Professor Arner is partnering with Professor D. Zetsche (ADA Chair in Financial Law/Inclusive Finance) at the University of Luxembourg and Professor R. Buckley at the University

of New South Wales in Sydney, Australia to form an international law team based in three continents and three major global financial centres. The team, alongside other renowned researchers and FinTech regulators, presented their latest work at the third annual FinTech Conference organised by the University of Luxembourg's Research Unit in Law in October 2017.

34. HKU will take advantage of emerging opportunities for further strategic partnerships for example through the MIT Innovation Node, HKSTP/Cyberport, ASTRI, the Beijing Institute of Collaborative Innovation, and the Universitas 21 Translational Research Alliance.

35. Through partnership with local governments, HKU has established bases in Shenzhen and Zhejiang for research, innovation and enterprise. The institutes represent an integral part and an extension into the Chinese Mainland of the University's research. The facilities offer opportunities for HKU researchers to widen their areas of investigation and strengthen partnerships with Mainland research communities. They also play an important role in harnessing technology and innovations from HKU and incubating them in mainland China with potential industry adoption. Administrative support for activities and developments in the Mainland is provided by HKU's Mainland Research Projects Office (MRPO).

36. MRPO supports and promotes HKU's research in the Mainland by informing the HKU community about funding opportunities in China, coordinating submissions, monitoring award progress and managing project completions. This complements other administrative units to create synergy and coordinate research activities in the Mainland. MRPO also organises seminars and workshops that promote Mainland research, innovation and entrepreneurship opportunities on the HKU campus. A forum was held on November 28, 2016 on research, innovation, and funding opportunities in mainland China. In addition, a grant briefing workshop and a grant writing workshop were held on January 12, 2017 and February 6, 2017, respectively.

37. The HKU-Shenzhen Institute of Research and Innovation (HKU-SIRI, www.siri.hku.hk) provides an HKU base in the Pearl River Delta region. Since its inception in 2011, HKU-SIRI has attracted considerable funding at both local and national levels such as the National Key Research and Development Program of China (previously known as the 973 Program) (國家重點研發計劃-前稱 973 計劃), the National Natural Science Foundation of China (NSFC) (國家自然科學基金), and the Shenzhen Science and Technology Program. For example, in the past reporting year, HKU-SIRI received total funding of RMB8.7 million for 4 projects under the National Key Research and Development Programme, over RMB5 million for 10 projects under NSFC, and RMB3 million for 1 basic research project (Theme-based) under the Shenzhen Science and Technology Program. Currently 6 laboratories are involved, with 148 research projects to date, 6 patents granted and 2 filed, and nearly 250 papers published.

38. HKU-SIRI will be relocated from the Shenzhen Software Park to the nearby Shenzhen Virtual University Park by the end of 2017. The new location will have both dry and web laboratories and is expected to be operationally ready by early 2018.

39. As well as the joint PhD supervision with the Southern University of Science and Technology (SUSTech), HKU is also involved in synergistic collaboration with SUSTech in establishing an HKU-SUSTech joint research laboratory, with an agreement signed in May 2017. A joint research symposium comprising presentations by postgraduate students

and supervisors was held in October 2017 in HKU.

40. The HKU-Zhejiang Institute of Research and Innovation (HKU-ZIRI, www.ziri.hku.hk) is a tactical initiative of HKU for research-innovation-enterprise value-chain development in a strategic location in China. It was set up through a four-party agreement, and collaborations with Zhejiang local institutes and enterprises are expanding. HKU-ZIRI works along five research directions – Alternative Energy, Smart Materials, Advanced Manufacturing, Biomedical Interfaces and Sustainable Environment – under HKU’s framework of (3+1)Is: Internationalisation, Innovation and Interdisciplinarity, all converging to create Impact. HKU-ZIRI has wet lab facilities for chemical and biological sciences. HKU-ZIRI members also attract national and local funding – for example, through the Zhejiang Provincial Key Research Plan (浙江省重點研發計劃) and the National Natural Science Foundation of China (NSFC) – and received total funding of RMB1.5 million for 2 research projects in the reporting year. To date, 78 papers have been published.

41. A 3-day Inaugural Symposium for HKU-ZIRI attended by nearly 300 participants was held on September 21–23, 2016 to mark the launch of the research and innovation initiatives. The Symposium focused on 5 themes: advanced manufacturing, alternative energy, biomedical interfaces, smart materials and sustainable environment. Academics from HKU, the Chinese Academy of Sciences, Tsinghua University, Zhejiang University, Fudan University, and overseas universities including the University of Pittsburgh, University of Melbourne, and Agency for Science, Technology and Research of Singapore participated in academic exchanges and discussions. Officials from the Zhejiang Province Technology Office, Hangzhou Science and Technology Committee, Lin’an city government and Qingshan Lake Sci-tech City management committee attended the inauguration ceremony.

42. A spring symposium, attracting over 150 participants, was held at HKU-ZIRI on March 17, 2017, focusing on new materials, biomedical sciences, energy and the environment. In addition, a summer industrial symposium was also held on June 26, 2017. This one-day forum focused on industrial collaborations on some of the themes that represent the research directions of HKU-ZIRI. There was also a session by the Technology Transfer Office on Innovation, Entrepreneurship, IT and Artificial Intelligence initiatives. The forum provided an excellent opportunity to discuss with potential industry collaborators as well as exchange with other research and academic leaders in these fields.

43. Large numbers of individual researchers undertook collaborative projects during the report period with researchers in mainland China or elsewhere in the world across a wide range of activities, including joint research projects, co-authoring of papers, academic visits with or without teaching activities, providing consultancy or peer review services, supervising research students, serving as external examiners, and so on.

44. To help increase research competitiveness and international collaboration, HKU has introduced a number of initiatives. Details are given below for the application rounds for these initiatives during the reporting period.

- (a) *Distinguished Visiting Scholars Scheme*: The scheme, introduced in 1996, aims to enhance the University’s visibility in the international academic community; provide opportunities for our academics to interact with world-class scholars; provide the impetus to promote the development of targeted

academic areas; and establish links with institutions leading in the discipline. Over 70 prominent scholars who are at the forefront of their discipline have been appointed under the scheme as Distinguished Visiting Professors, including 4 appointed during the reporting year for visits in 2017–18.

- (b) *Visiting Research Professors Scheme*: Since its inception in 2009, the Visiting Research Professors Scheme (VRPS) has attracted 55 leading scholars from around the world. In this reporting year, 9 nominations were received, and 4 awards were made to prominent professors from Seoul National University, the University of St. Andrews, the University of Edinburgh, and the University of the Basque Country. The mid-term/final reports on VRP appointments received from Faculties highlighted 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.
- (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 2016–17, 7 HKU staff visited overseas universities – Harvard University, Stanford University, Princeton University, Imperial College London, the University of British Columbia, the University of Michigan, Columbia University and New York University – while 7 awards were freshly given to support HKU staff to visit overseas institutions within the 2017–18 academic year.
- (d) *Glasgow/HKU Early Career Mobility Funds*: HKU and the University of Glasgow launched the reciprocal Glasgow/HKU Early Career Mobility Funds to enable early career researchers to spend part of their research time in the partner institution. In the reporting year, 4 awards were made to members of academic staff who will visit the University of Glasgow in the 2017–18 academic year.
- (e) *King's/HKU Fellowships*: HKU and King's College London established 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, 2 Fellowships were awarded to HKU staff members who will visit King's in the academic year 2017–18.
- (f) *Doris Zimmern HKU-Cambridge Hughes Hall Fellowship*: 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. Since its inception in 2009, 67 HKU members have been awarded Fellowships to reside at Hughes Hall for research collaboration and academic exchange, and 8 of them paid their visits in the academic year 2016–17.

3. Knowledge Exchange

45. Translating knowledge and discovery into societal impact is the University's ultimate goal, and knowledge exchange (KE) is regarded as the engine of impact. The UGC's earmarked funding for knowledge transfer has enabled the University to build capacity and develop strategies that take HKU knowledge from the campus to the community through technology transfer, entrepreneurship, community engagement, and knowledge access.

46. Since 2009, the University has put in place infrastructure to support KE, including a KE Office (KEO, www.ke.hku.hk) and counterpart units within each faculty. KE activities are reported to UGC annually. Some highlights from the 2016–17 reporting year include the following:

- (a) *Enhancing Capabilities and Capacity for Realising and Corroborating Impactful Research*: In 2016 the university-wide KE Excellence Award – launched the previous year and which has a strong emphasis on the significance of impact – went to Ms Amanda S. Whitfort of the Department of Professional Education in the Faculty of Law. The project was a “Review of Animal Welfare Legislation in Hong Kong” and it serves as an excellent example of the impact of HKU's KE. Other examples of the impact of HKU's KE include (i) an RFID-enabled real-time ubiquitous manufacturing platform, (ii) an immersive and interactive virtual reality system, (iii) high performance phosphorescent platinum (II) emitters for OLED applications, and (iv) an evaluation of a pioneering service delivery model for pre-schoolers with special education needs. In the reporting year, 6 impact workshops by experts from UK universities were organised by the KEO in collaboration with the Faculties concerned. The UGC issued a consultation document on the Research Assessment Exercise (RAE) 2020 in May 2017, proposing, inter alia, that impact be introduced as an element of assessment in the next RAE, with a weighting of 20%. The proposed framework is very close to that of the REF 2014. The efforts of HKU's KEO in the past years are in alignment with this development and the UGC's direction.

Interdisciplinary KE Project Fund

The University allocated HK\$1.5 million to support KE, using the additional funding allocated by the UGC to the University at the end of the 2012–15 triennium. KEO has used this funding to conduct a one-off funding exercise to encourage interdisciplinarity in KE. This initiative supports the University's strategy to promote ‘Interdisciplinarity’, which is one of the (3+1)Is – Internationalisation, Innovation and Interdisciplinarity, which converge to create Impact – set out in the ‘HKU Vision 2016–2025’, the strategic outline that defines HKU as Asia's Global University. The Interdisciplinary KE Project Fund aims to facilitate interdisciplinary KE projects that have the potential to create social, economic, environmental or cultural impacts for industry, business or the community by building on interdisciplinary research in the University, with priority given to cross-Faculty collaboration. Projects should last for no more than 2 years. The funding has successfully encouraged cross-Faculty KE projects, attracting 21 quality proposals, of which 9 were supported.

Impact Project Funding Scheme

The University continued to use the KT funding to run the Impact Project Funding Scheme in 2016/17, which has become an important enabler for our academic staff to benefit the broader community with their expert knowledge. In the reporting year, 58 proposals were received, of which 51 were supported. Completed projects include (i) “An Integrated Approach to Conservation Forensics: Reducing Wildlife Trade Globally through Technology, Analytics and Education”, and (ii) “Empowering a Non-Governmental Non-Profit Organization to Deliver Oral Home Care and Promote Awareness of Dementia in Elderly Care Centers”.

- (b) *Broadening Knowledge Access and Community Engagement*: Community engagement has become embedded not only in the regular activities of our Faculties but also in collaborative projects. For example, the Faculty of Arts and the University Museum and Art Gallery jointly organised the exhibition ‘Rising Above: The Kinsey African American Arts & History Collection’ from December 2016 to February 2017, in collaboration with KBK Enterprises, Inc. and the Bernard and Shirley Kinsey Foundation for Arts & Education. The Gerontech and Innovation Expo cum Summit (GIES), held on June 16–18, 2017 in the Hong Kong Convention and Exhibition Centre, was jointly organised by the HKSAR Government, Hong Kong Council of Social Service and HKSTP. GIES aims to support the Government’s policy of promoting healthy and active ageing. KEO coordinated HKU’s participation to showcase 7 projects, and talks were given by HKU researchers. The KT funding was used to support 30 student KE projects in the reporting year. The University also makes use of other funds to encourage students to undertake community projects, for example, the Service 100 Fund and the We Are With You Project Scheme that are administered by the Centre of Development and Resources for Students.

University–Industry Partnership

47. An important part of KE is university–industry partnership, and a key aim at HKU is to bring the University’s innovative research results to the wider world through technology transfer, as the practical application of technological advances benefits both the University and the community as a whole. The Technology Transfer Office (TTO) provides services relating to Intellectual Property (IP) management, technology marketing and transfer, research contract review and liaison with industries and businesses, while commercial operations come under Versitech, a wholly-owned subsidiary of HKU.

48. One example of an ongoing partnership between HKU and industry is a project related to the University’s OLED research. TCL Corporation Ltd is collaborating with Professor V.V.W. Yam of the Department of Chemistry on the development of new OLED materials based on Professor Yam’s innovative Au(III)-based OLED system. Together they applied for the Introduced Innovative R&D Team of Guangdong 廣東省引進創新創業團隊計劃 funding under a project titled “Core Team of New Printable OLED Materials and Technology 廣東省第五批珠江人才計畫 — 新型印刷 OLED 材料與技術核心團隊”. Professor Yam is the lead researcher of the project, which was approved by the Guangdong Government with funding of RMB50 million. The new HKU-TCL Joint-Research Laboratory for New Printable OLED Materials and Technology was officially

opened at HKU in August 2017 to support the collaboration.

49. Important links formed by HKU in the reporting year to aid university-industry collaboration and the translation of research and transfer of technology include a memorandum of understanding between HKU and the Hong Kong Applied Science and Technology Research Institute (ASTRI) signed in October 2016 to set up the HKU-ASTRI Joint Research Laboratory. This is the first time that HKU has established collaboration with a research institute to focus on financial technologies (FinTech) education, health technologies (HealthTech) and smart city technologies. These are areas in which ASTRI has devoted significant research effort with the aim of enhancing Hong Kong's competitiveness and contributing to its transformation into a sustainable and diversified economy. The collaboration will help enable creative basic research to flow through the value chain to become innovative technology and have significant impact, in the form of products, processes, services, even new industries or setting consumer trends and industry standards. Both ASTRI and HKU have agreed to jointly carry out R&D projects in areas covering FinTech, HealthTech and Smart City and promote scientific and technological co-operation. The co-operation is committed to continue for at least 5 years under which a new generation of researchers will be trained through scientific and student exchanges.

50. Over the past year, TTO has continued to strengthen professional capabilities in technology transfer in support of the University's mission of KE. The following training courses and events were organised in 2016–17:

- (a) *InnoCarnival*: HKU was one of the co-organisers for this major 9-day event that was organised by the Innovation and Technology Commission and held from October 29–November 6, 2016 at the Hong Kong Science Park. Under the theme of “Smart Living. Innovative Hong Kong”, HKU showcased 7 research projects from the Faculties of Education, Engineering, Medicine and Science, with the key exhibit of the solar car – Helios – which won the 2016 Overall Champion Award and Innovative Design Award of the “New Energy New Generation” solar car competition held by the Electrical and Mechanical Services Department.
- (b) *AUTM AISA 2017*: HKU co-organised AUTM Asia 2017 with other universities in Hong Kong and Macau, and the Hong Kong Science and Technology Parks Corporation (HKSTP). The event was held on April 23–26, 2017 at the HKSTP. This was the first time that this international technology transfer conference had been held in Hong Kong. It brought together speakers from academic research institutes and industries, entrepreneurs and technology transfer professionals to address global issues on innovation and IP development, entrepreneurship and technology transfer in different regions, and trends in technology management. HKU invited a number of prominent overseas speakers to deliver keynote addresses and take part in panel discussions at the conference.
- (c) *Entrepreneurship Academy 2017*: The popular workshop on entrepreneurship by DreamCatchers was offered again in February 2017. Over 400 students, staff and alumni signed up. In this ten-week workshop, speakers from industries who themselves are successful entrepreneurs shared their experience in turning their ideas and research into real business, while HKU professors explained the fundamental concepts of business development and finance to participants. Participants also visited Cyberport and theDesk, a co-working space in Sai Wan, to explore their

possible startup routes through the support available from this open co-working space for entrepreneurs.

- (d) *HKU DreamCatchers 100K 2017*: DreamCatchers 100K is the seed fund competition for all entrepreneurial students and young alumni under the age of 35. In the second year of the competition, 104 applications were received in December 2016 and 55 teams were invited to a 5-min Pitch. 20 finalists were selected and each team was matched with a mentor from industry. The Final Pitch was held in April 2017 and 10 teams were awarded a HK\$100,000 prize each to kick start and continue their business ventures. Judges included academics, investors and CEOs from Cyberport and Hong Kong Science Park. The winning teams will be invited to station at iDendron, HKU's brand-new Innovation and Entrepreneurship Hub, to continue their business ventures.
- (e) *DreamCatchers MedTech Hackathon 2017*: HKU co-organised with HK Science Park a 1-week intensive programme from June 18–25, 2017 to let participants find solutions for unmet medical needs. 10 students (and recent graduates) from Stanford University, 32 from HKU and 8 from HK Science Park and other local universities including PolyU and HKUST joined the programme. HKU students from the Faculties of Medicine, Engineering, Science, and Business and Economics attended lectures about business models, Hong Kong's Healthcare system, the Stanford Biodesign method, and patent and pitching skills as well as visited clinicians in hospitals and met with technical and business mentors. On the final day, they produced their prototype solutions in the Science Park and pitched them to industry experts and investors.
- (f) *EmTech Hong Kong 2017*: HKU was the Premier Innovation Partner of EmTech Hong Kong 2017, held on June 6–7, 2017 at the Hong Kong Convention and Exhibition Centre. It brought together some leading scientists and industry experts in artificial intelligence, materials science, biomedicine, cybersecurity and FinTech to share breakthrough research and discoveries and commercialisation. It also provided academics, companies, business partners and innovators around the world with some good networking opportunities. Professor V.V.W. Yam of HKU's Department of Chemistry gave an invited talk on new classes of molecular materials for various optoelectronic applications.
- (g) *Dialogue with Dov Moran – the inventor of the USB memory stick*: In this event jointly organised by the Graduate School and the TTO on June 14, 2017, Mr Dov Moran – a renowned inventor/entrepreneur/investor who invented the USB memory stick – shared his valuable experience on how to translate research results into commercial products and services. Research postgraduate students, researchers and spin-off founders of HKU had the opportunity to have an informal and interactive dialogue with Mr Moran and gain better insight into entrepreneurship and successful cases of startup companies.
- (h) *The Global Youth Entrepreneurs Forum 2017*: HKU DreamCatchers co-organised this forum with the Hong Kong Federation of Youth Groups on June 13-14, and connected over 1,000 young entrepreneurs, industry experts, angel investors, corporate and government representatives, and

stakeholders from 20 countries and regions. The two-day programme included a full-day forum at HKU and a visit to the Qianhai innovation hub. Over 70 speakers shared their insights and experiences of innovation in China, the internet of things, fundraising, travel entrepreneurship, social media, FinTech, social innovation, e-commerce, etc.

HKU Innovation and Entrepreneurship Hub (“iDendron”)

51. In the reporting year, work began on a dedicated physical base for innovation and entrepreneurship development in HKU – iDendron – which was recently launched at the beginning of the 2017–18 academic year. The innovation space aims to

- Ignite and develop the culture on creativity, innovation and entrepreneurship across the campus through entrepreneurship-based and innovation-inspiring activities;
- Act as the resource hub to incubate and support early-stage startups initiated by HKU students and young alumni; and
- Build and engage a community of innovators and entrepreneurs within and beyond our network. This will include undergraduate and postgraduate students, alumni, staff, friends, other institutions and industries of the entrepreneurial movement worldwide.

TSSSU@HKU

52. In the reporting year, the TSSSU@HKU funding scheme entered its fourth round of application. A total of 22 applications were received in January 2017 for new and existing start-up companies, and 9 were awarded (7 of which are commercialising HKU technologies), with total funding of HK\$4 million:

- (a) Accosys Limited – an indoor localisation system for providing indoor positioning solutions and services;
- (b) CISC Limited – provision of cyber intelligence and cyber security consulting service and solutions;
- (c) Conzeb Limited – high-speed imaging for cancer diagnostics;
- (d) EN Technology Limited – novel encapsulation technologies for the food and cosmetics industries;
- (e) Enzyme Design Limited (new) – design and improvement of industrial enzymes that have remarkable industrial potentials;
- (f) Hactis Limited – virtual reality technology for training and education;
- (g) ImmunoDiagnostics Limited – provision of immunology and diagnostic solutions;
- (h) Lifespans Limited (new) – implants for repairing bone fractures in the elderly; and
- (i) SkinData Limited – development of skin-whitening products.

Contract Research Projects and Licensed Inventions

53. A number of examples of successful university-industry partnerships took place during the reporting year. Versitech Ltd undertook a total of 9 contract research projects within 2016–17 with various industrial sectors.

54. Some examples of the latest developments of HKU technologies transferred include the following:

- (a) *Flow-through Hybridisation*: Developed by a research team in Biochemistry, the “flow-through hybridisation” is a patented technology of the University to address the problems in conventional DNA hybridisation techniques. In conventional hybridisation of nucleic acids, DNA samples are dotted or transferred to a membrane by blotting techniques. Only a small part of the target DNA is located at the surface of the membrane, and fragments smaller than 300pb are undetectable because they are trapped inside the membrane, so multiple runs are always needed. A low density medical gene chip working platform, HybriMax, was developed based on the above-mentioned HKU technology, which was licensed to Guangdong HybriBio Biotech Co., Ltd (“HybriBio”). HybriMax provides rapid, sensitive and highly accurate diagnosis of diseases by analysing nucleic acid samples.

HybriBio is gradually becoming a lead provider of in vitro diagnostic assays in Greater China, with a fully integrated operation chain from R&D, manufacturing, sales and marketing to an after-sales technical support service. One of the kits used with HybriMax is the next generation 37 HPV GenoArray Diagnostic Kit, which can simultaneously detect 37 HPV genotypes in a single run. More than 1,200 hospitals and medical institutes in China have adopted this HPV diagnostic technology, and more than 20 countries around the world have been using its products for clinical and research purposes. On April 12, 2017, HybriBio was successfully listed on the GEM of the Shenzhen Stock Exchange.

- (b) *“CR eFiling” Mobile Application*: The Companies Registry’s e-Registry was launched in 2011 to provide electronic incorporation (e-Incorporation) and electronic submission (e-Submission) services to users. The underlying electronic form processing technology was developed at the University, providing a cross-platform solution that allows end users to fill out and submit their e-Forms on desktop computers running different operating systems such as Microsoft Windows, Apple OSX and the open-sourced Linux. With the enabling e-Form technology, the time to process a new company incorporation by the Companies Registry has been greatly reduced from four days to less than an hour.

Furthermore, a new mobile electronic form processing technology developed at the University has recently been adopted by the Companies Registry. The new “CR eFiling” mobile solution, launched by the Companies Registry earlier this year, enables users of its e-Registry service to submit 13 of the most commonly used e-Forms using mobile devices such as Apple iPhones and Android tablets. The number of e-Forms supported will continue to grow as the Companies Registry rolls out new phases regularly in the near future.

4. Undergraduate Research

55. In September 2016, the sixth round of the Undergraduate Research Fellowship Programme (URFP) was undertaken. The URFP was introduced by HKU in 2011 with the

aims of enhancing the learning experience of undergraduate students and nurturing the next generation of researchers/scholars through providing opportunities for students to undertake research study under the guidance and supervision of academics with a strong research track record and experience in training research postgraduate students. In the first 5 rounds, 332 academically outstanding undergraduate students enrolled in the programme, 151 of whom were granted awards to undertake internships locally, in the Mainland or overseas. In the sixth round, 69 students were selected for enrolment, of which 32 were granted awards to undertake internships. These students are expected to complete their research study within the 2017–18 academic year.

56. The annual URFP poster session – the second such event – was held in April 2017 for recipients of the research internship awards from different Faculties to present their research findings and share their experience, as well as to promote the URFP to undergraduates and the wider community at HKU. The event, which ran for a week, opened with a welcoming session hosted by the Vice-President (Teaching and Learning) and was attended by students, academics and senior management.

5. Research Highlights

57. Research highlights for HKU in 2016–17 include the following:

Theme-based Research Scheme (TRS)

58. The Theme-based Research Scheme (TRS) was introduced to support themes of strategic importance to the long-term development of Hong Kong. In the seventh round of the scheme – the results of which were announced in July 2017 – 2 HKU-led projects received a total budget valued at HK\$83.3 million (including on-costs) for a period of 5 years. The projects represent a collaborative effort by researchers from local and overseas institutions and look at tumour heterogeneity and molecular evolution in metastatic gastrointestinal tract cancers and big data technologies for air pollution monitoring and health management. HKU is also collaborating in all 3 other projects funded in this round.

59. In the 7 rounds of TRS, the RGC has awarded funding to a total of 35 projects. HKU is the co-ordinating institution of 16 awarded projects, which have received total funding of HK\$723 million, with HKU researchers also involved in a further 15 projects.

Areas of Excellence (AoE)

60. To nurture areas of international excellence through high-quality research and inter-institutional collaboration, the Areas of Excellence (AoE) scheme has provided support for 21 projects over 7 funding rounds since its inception. HKU is the co-ordinating institution of 9 of these 21 AoE projects, representing total funding of HK\$689 million. The University is also participating in a further 8 co-ordinated by other institutions.

61. HKU-led AoE projects include one project funded during the reporting year in the 7th round of scheme. The project is titled “Chemical Biology Approach to Molecular Medicine”, with an approved budget of HK\$83.82 million.

2017–18 General Research Fund / Early Career Scheme (GRF/ECS) Exercise

62. HKU was awarded total funding of HK\$138.155 million (excluding on-costs) for 198 projects in the 2017–18 General Research Fund (GRF) exercise, with a fifth (20.6%) of the supported projects being those of HKU Principal Investigators. HKU submitted 618 applications in this round, giving a success rate of 32%. As with last year, the University received the largest amount of funds for projects under the Biology and Medicine Panel. HKU has secured the largest number of projects and share of funding in 14 of the last 15 GRF rounds.

63. In the 2017–18 funding round of the Early Career Scheme, RGC supported a total of 151 projects. HKU submitted 72 applications in this round, of which 27 were approved, securing HK\$16.00 million in funding (excluding on-costs).

2016–17 Collaborative Research Fund (CRF) Exercise

64. Of the 18 projects funded in the 2016–17 round of RGC’s Collaborative Research Fund, HKU is the coordinating university of 7 Group Research Grants and 1 Equipment Grant. The University is participating in a further 7 projects as a collaborating institution. The awarded amount to HKU is HK\$47.5 million, which is the highest amount amongst the UGC-funded universities. The 8 projects with HKU as lead institution are as follows:

Equipment Grant

- (a) “Establishment of Third Generation Sequencing Core Facility”, HK\$3.22 million*, Project Coordinator: Professor P.C. Sham (Li Ka Shing Faculty of Medicine), in collaboration with CityU, HKBU, CUHK, PolyU and HKUST;

Group Research Grants

- (b) “Making Modernity in East Asia: Technologies of Everyday Life, 19th–21st Centuries”, HK\$6.63 million*, Project Coordinator: Professor K.C.A. Leung (Hong Kong Institute for the Humanities and Social Sciences), in collaboration with HKUST;
- (c) “Mechanisms of Renal Inflammation: Role of Toll-like Receptor 4”, HK\$7.52 million*, Project Coordinator: Professor S.C.W. Tang (Department of Medicine), in collaboration with CUHK;
- (d) “Environmental Studies of the Spread of Respiratory Viruses in a Large Dense Urban Social Network”, HK\$7.60 million*, Project Coordinator: Professor Y. Li (Department of Mechanical Engineering), in collaboration with HKUST;
- (e) “Regulation and Pathogenic Role of Latent Infection of Epstein-Barr Virus in Nasopharyngeal Carcinoma”, HK\$6.32 million*, Project Coordinator: Professor G.S.W. Tsao (School of Biomedical Sciences), in collaboration with CUHK;
- (f) “Advancing China’s Urbanization Inside Out: Urban Redevelopments in Chinese Cities Amidst Accelerated Urban Transition”, HK\$2.71 million*, Project Coordinator: Professor G.C.S. Lin (Department of Geography), in collaboration with EdUHK;
- (g) “Multi-scale Single-cell Optical Imaging: Architecture and Biomedical Applications”, HK\$7.33 million*, Project Coordinator: Dr K.K.M. Tsia (Department of Electrical and Electronic Engineering), in collaboration with

CUHK; and

- (h) “Optogenetic Functional MRI Dissection of Long-range Brain Networks”, HK\$6.14 million*, Project Coordinator: Professor E.X. Wu (Department of Electrical and Electronic Engineering), in collaboration with CityU and CUHK.

* excluding on-costs

Humanities and Social Sciences Prestigious Fellowship Scheme (HSSPFS)

65. In the 2017–18 funding round of the Humanities and Social Sciences Prestigious Fellowship Scheme, of the 5 applications funded HKU received the largest share, with 2 successful projects awarded a total of HK\$1.784 million (excluding on-costs):

- (a) “Assessing Early Childhood Development and Learning: The First Step to Building Human Capital in One Belt One Road Countries”, Principal Investigator: Professor N. Rao (Faculty of Education); and
- (b) “Impacts of Economic Restructuring of Export-oriented Industrialization on Urban Development in the Pearl River Delta – A Case Study of Dongguan”, Principal Investigator: Professor A.G.O. Yeh (Department of Urban Planning and Design).

66. Since the scheme began in 2012–13, HKU has the highest cumulative number of fellowships and largest funding amount of any UGC-funded institution: 13 fellowships (total value HK\$9.067M) out of a total of 34 awarded (total value HK\$23.189M).

NSFC/RGC Joint Research Scheme

67. Through the National Natural Science Foundation of China/Research Grants Council (NSFC/RGC) Joint Research Scheme in 2016–17, funding of HK\$24.21 million was awarded to 22 projects from 6 UGC-funded institutions. HKU submitted 38 initial applications, of which 8 were shortlisted and 4 funded. HKU received total funding of HK\$4.298 million for the following projects:

- (a) “Construction and Mechanism of Supertough/Superwetting Nanocrystalline Interface on Flexible Polymeric Membranes for Water/Oil Separation”, Dr C. Tang (Department of Civil Engineering);
- (b) “Ultrafast Spectro-temporal Measurement Based on Photonic Integration”, Professor K.K.Y. Wong (Department of Electrical and Electronic Engineering);
- (c) “Study of the Degradation Behaviors and Osteogenic Effects of Mg-Si Based Biomaterials”, Professor K.M.C. Cheung (Department of Orthopaedics and Traumatology); and
- (d) “Identification of Susceptibility Genes Involved in the Pathogenesis and Prediction of Thyrotoxic Periodic Paralysis”, Dr C.L. Cheung (Department of Pharmacology and Pharmacy).

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

68. HKU-SIRI members are eligible to apply for funding through the National Natural Science Fund of the National Natural Science Foundation of China (NSFC). HKU-SIRI

received total funding of RMB5.28 million in 2016–17 for 10 projects under the NSFC.

European Commission (EC)/Research Grants Council (RGC) Collaboration Scheme:

69. The EC/RGC Collaboration Scheme was launched in 2016–17 by the EC and RGC to foster European-Hong Kong collaboration in academic research and support the participation of Hong Kong researchers in joint research projects conducted under the framework of Horizon 2020. Funding of HK\$9 million was awarded to 4 projects from 3 UGC-funded institutions. Dr H. Yen of HKU's School of Public Health received funding of HK\$2.5 million for a project entitled "Delta-Flu: Dynamics of Avian Influenza in a Changing World" in collaboration with the Friedrich-Loeffler-Institut.

Innovation Technology Support Programme (ITSP)

70. Up to the end of June 2017, HKU has had 198 projects approved under the Innovation and Technology Fund's Innovation Technology Support Programme (ITSP), which was introduced in 1999. This represents about a fifth (18%) of the 1,124 projects approved under ITSP, and HKU has received total funding of HK\$498.67 through this scheme.

71. In the reporting year, 11 HKU projects were awarded total funding of HK\$14.05 million. A further 3 projects were funded HK\$8.22 million under the University-Industry Collaboration Programme (UICP).

Public Policy Research Funding Scheme

72. The University was awarded total funding of HK\$4.46 million for 9 projects in 2016–17 under the Public Policy Research funding scheme, which is administered by the Central Policy Unit (CPU).

Strategic Public Policy Research Funding Scheme

73. The CPU introduced the re-modelled Strategic Public Policy Research Funding Scheme in 2016–17 to facilitate longer-term public policy research, capacity building and collaboration. Dr X. Yan (Department of Politics and Public Administration) has been awarded HK\$3 million for a project entitled "The Implementation of 'One Country Two Systems' in Hong Kong".

Croucher Foundation: Fellowships and Innovation Awards

74. HKU has been awarded more Croucher Foundation Senior Research Fellowships (52 out of a total of 112 fellowships awarded since 1997, including Senior Medical Research Fellowships) than any other local institution. In the reporting year, all 3 fellowships awarded by Croucher were to HKU scholars: Professor X. Cui (Department of Physics) and Professor L.M.L. Poon (School of Public Health) were awarded Senior Research Fellowships, and Professor A.Y.H. Leung (Department of Medicine) received a Senior Medical Research Fellowship.

75. The Croucher Foundation also offers substantial support through the Innovation Awards 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. Of the 12 awards given since the inception of the Innovation Awards in 2012, 7 have been awarded to HKU researchers.

76. In 2016–17, Dr C.C.L. Wong (Department of Pathology) was awarded HK\$5 million over 5 years through the Innovation Awards for her research project “Identifying the Metabolic Vulnerabilities of Liver Cancer”.

Other Croucher Foundation Funding

77. The Foundation also provides support for doctoral and postdoctoral research through studentships and fellowships. For example, in the reporting year, Miss Y.L.B. Cheng (a PhD student in the Department of Medicine) received a Butterfield-Croucher Studentship to support her research at HKU, and Dr X. Lu (a PhD graduate of the Department of Mechanical Engineering) received a Croucher Fellowship for Postdoctoral Research at Yale University.

78. The Foundation offers a start-up allowance for recipients of the Croucher Fellowship for Postdoctoral Research upon their return to Hong Kong to take up tenure-track faculty positions in UGC-funded institutions. Dr T.K. Wong (Department of Mathematics) was awarded HK\$0.5 million to be used over 5 years for his research.

79. To enable experts in a particular field to meet and conduct advanced tuition on a defined topic, the Croucher Foundation sponsors a number of Advanced Study Institutes (ASIs) each year. Sponsorship for 2 ASIs in the coming year was approved in June 2017. Croucher also supported the visit of Professor D.M.P. Mingos FRS of the University of Oxford to deliver a research management colloquium in HKU and visit other universities in Hong Kong in November 2016.

80. The Croucher Foundation also provides funding for summer courses to help educate and inspire promising postgraduate students and early career researchers from Hong Kong and the wider region. Successful applicants receive HK\$0.6 million per course for 3 courses to be held once every 2 years over a period of 6 years. HKU held 2 summer courses in August 2017 on cancer biology and advanced imaging.

81. Sponsorship is also provided through the Croucher Foundation for international conferences and seminars. Three conferences in the areas of biotechnology, influenza transmission and transmission of respiratory viruses were organised by HKU researchers during the reporting period, each with funding of HK\$100,000. Sponsorship for a conference in the coming year on smart transportation was also approved in June 2017.

Hong Kong Jockey Club

82. Substantial support is also provided to the University’s research through donations and funding for research projects from the Hong Kong Jockey Club (HKJC). Examples during the reporting year included a project led by Professor E.Y.H. Chen (Department of Psychiatry) on “Early Mental Health Intervention for Women-in-Need in Hong Kong”, and a project led by Professor T.Y.S. Lum (Sau Po Centre on Ageing) on the “Jockey Club Age-friendly City Project (Second Phase) – Baseline Assessments, Training, District Engagement and Professional Support for Three Districts”.

HK Scholars Program

83. The HK Scholars Program is a 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) that aims to nurture outstanding postdoctoral fellows (PDFs) from the Mainland in Hong Kong. In the sixth round of this initiative (for which the results were announced in July 2017), 10 HKU researchers were selected to supervise PDFs for a period of 2 years.

Overseas Funding Sources

84. Funding also comes from a wide range of overseas funding bodies in Asia, Australia and New Zealand, Europe and North America. Examples include the National Institutes of Health (NIH), the European Commission, and the Australian Research Council. For example, HKU academics from the School of Public Health are involved in an ongoing collaboration with the St. Jude Children's Research Hospital for the NIAID Centers of Excellence for Influenza Research and Surveillance funded by NIH, and a project on influenza research through the Centers for Disease Control and Prevention. In 2016, HKU received funding from the European Commission to carry out 2 projects by researchers in the School of Modern Languages and Cultures.

Published Research

85. 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*. Recent examples include a publication in *Science* on a super steel breakthrough developed by an HKU-led Beijing-HK-Taiwan team, and two series papers and a commentary on paediatric surgery in *The Lancet*.

86. 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 (CDCF data mart website). For 2016–17, HKU had 5,331 peer-reviewed refereed publications. The University does particularly well in scientific publications. According to statistics published by Clarivate Analytics, there were a total of 498,625 citations of 30,746 HKU papers in journals tracked by Clarivate Analytics between January 2007 and April 2017. This was the highest number of citations of any UGC-funded institution. In 2016, the University had 4,740 publications in journals tracked by Clarivate Analytics, again more than any other UGC-funded institution, attracting 15,947 citations to date (data collected from Web of Science on November 1, 2017). Clarivate Analytics also ranked 118 HKU professoriate staff among the world's top 1% of scientists, based on the number of citations recorded for their publications (April 2017). In addition, 12 HKU academics have been named among the world's top scientists in the 2017 Highly Cited Researchers from Clarivate Analytics, based on the number of papers officially designated by Essential Science Indicators as Highly Cited Papers (November 2017) – detailed below in paragraph 113(n).

Patents

87. In 2016–17, HKU filed 144 patent applications, and 64 patents were granted and 8 patent applications were abandoned. HKU has filed 1,850 patents since 1998 in various parts of the world, mostly in the United States (803), the European Union (252) and

Greater China (312 in China, including Hong Kong, and 26 in Taiwan). Within the same period 616 patents were granted, 36.53% of which were in the United States (225).

Agreements/Legal Documents

88. The University handled 654 technology/knowledge transfer related agreements/legal documents in 2016–17 – such as licensing, consultancy and materials transfer agreements – with counter signing parties in Hong Kong (254.5), the People’s Republic of China (166), North America (97.5), the European Union (60.8) and the rest of the world (75.2).

External Academic Honours

89. The University is proud of its record of academic recognition. A number of important academic awards and honours have been bestowed on HKU researchers over the reporting period, including the following examples:

- (a) Professor N. Shah, Professor of Food Science and Technology in the School of Biological Sciences, received the International Dairy Foods Association Research Award in Dairy Foods Processing from the American Dairy Science Association at an award presentation ceremony held in July 2016 in Salt Lake City, Utah. A renowned academic is chosen each year for the award from among the nominees all over the world. Professor Shah has made outstanding contributions to the Australian and international dairy industries over the past 35 years. His contribution in the arena of dairy foods processing research has been recognised internationally through various awards.
- (b) Professor V.W.W. Yam, Philip Wong Wilson Wong Professor in Chemistry and Energy and Chair Professor in the Department of Chemistry, received the Japan Society of Coordination Chemistry (JSCC) International Award. This award – presented at the annual JSCC Symposium – was set up to advance the field of coordination chemistry and is presented to researchers who have contributed to its development through outstanding and pioneering works. Professor Yam was awarded for her work on “Metal-Based Molecular Functional Materials – From Discrete Metal Complexes to Supramolecular Assembly, Nanostructures and Functions”.
- (c) Professor R.S.Y. Hui, Chair Professor of Power Electronics and Philip Wong Wilson Wong Professor of Electrical Engineering, has been named a Fellow by the Royal Academy of Engineering, UK, one of the most prestigious national academies. Professor Hui attended the New Fellow Induction ceremony in London on October 2016. The ceremony was officiated by HRH The Prince Philip, Duke of Edinburgh and Senior Fellow of the Academy. Professor Hui’s ground-breaking research focuses on power electronics, with emphasis on energy saving and reduction of electronic waste. Besides publishing extensively in top-tier research journals in power electronics, he has over 55 patents adopted by industry.
- (d) Dr G. Chiribella, an Associate Professor of the Computer Science Department, has been selected as a CIFAR-Azrieli Global Scholar, under a new international initiative to identify potential world leaders in research by the Canadian Institute for Advanced Research (CIFAR) and the Azrieli

Foundation. The programme aims to support young innovators at a pivotal time in their careers. Each scholar will become part of a global network of leading researchers pursuing answers to some of the most difficult challenges facing the world today in a range of interdisciplinary areas. Dr. Chiribella is among the first cohort of 18 CIFAR-Azrieli Global Scholars selected from among outstanding young scientists all over the world who are considered as rising stars in their fields of research. He is the first academic from an Asian institution to feature in the programme.

- (e) Mr Joshua Bolchover and Mr John Lin, both Associate Professors in the Faculty of Architecture, received the Royal Institute of British Architects (RIBA) Award for International Excellence as well as the RIBA International Emerging Architect award for their ambitious plan for Andong Hospital in Hunan's Baojing County in mainland China. Their award-winning research laboratory, Real Urban Framework (RUF), is part of HKUUrbanLab, the Faculty's research arm. RUF has completed projects in 18 communities across China and Mongolia, which range from small interventions, such as bridge and prototype housing construction, to schools, hospitals, and the post-disaster reconstruction of an entire village.
- (f) Professor F. Dikötter, Chair Professor of Humanities, has been awarded an honorary Doctorate by Leiden University, the Netherlands' oldest university, in recognition of the tremendous importance of his work for scholars in the area of the history of the Chinese Republican period and for both the scholarly and social significance of his work on the history of the People's Republic of China under Mao. Professor Dikötter was presented with this honour at Leiden University's Dies Natalis celebrations in February 2017. Professor Dikötter has also been appointed a Senior Fellow at the prestigious Hoover Institution with effect from September 2017. Established in 1919 and located at Stanford University in California, the Hoover Institution is one of America's most academically respected public policy research centres. Professor Dikötter joins a community of more than 100 outstanding scholars and leaders that seeks innovative policy solutions to modern-day challenges
- (g) Dr K.K.M. Tsia was one of the recipients of the 14th Chinese Science and Technology Award for Young Scientists, the award presentation ceremony for which was held in February 2017. The award was established in 1987 by the China Association for Science and Technology to give recognition to young scientists in China with exceptional accomplishments in the areas of natural science, engineering technology or technology transfer.
- (h) Professor Malik Peiris, Tam Wah-Ching Professor in Medical Science, Chair Professor of Virology of the School of Public Health, Li Ka Shing Faculty of Medicine, has been elected one of the 21 new foreign associates of The National Academy of Sciences (NAS) of the United States, in recognition of his distinguished and continuing achievements in original research. Professor Peiris is a clinical and public health virologist with a particular interest in emerging virus disease at the animal-human interface including influenza, coronaviruses (SARS, MERS) and others. His current research encompasses the pathogenesis, innate immune responses, transmission, ecology and epidemiology of human and animal (poultry, swine, wild birds) influenza viruses. In collaboration with colleagues, his

research has provided understanding on the emergence and pathogenesis of the 2009 pandemic H1N1 virus and on avian influenza viruses H5N1, H9N2 and H7N9. His work has provided evidence-based options for the control of these viruses in poultry and in humans. In 2003, he played a key role in the discovery that a novel coronavirus was the cause of SARS, its diagnosis and pathogenesis.

- (i) A project entitled “Investigation of Fabric Anisotropy for Saturated Sands and Its Influence on the Pile-Soil Interaction Mechanisms” carried out by Dr J. Yang and Dr R.W.M. Yan of the Department of Civil Engineering in collaboration with Zhejiang University was selected for conferment of the Natural Science Award – First Class by the Ministry of Education. The award ceremony was held in May 2017 at the Chinese University of Hong Kong.
- (j) State Natural Science Award (SNSA) 2016: Professor T. Zhang from the Department of Civil Engineering has been awarded a 2nd class award for a project entitled “Environmental Behavior and Health Effects of High Risk Pollutants and the Underlying Biomimetic Mechanisms” in collaboration with Nanjing University.
- (k) Professor C.M. Che, Zhou Guangzhao Chair Professor in Natural Sciences, was awarded the inaugural (Nobel Laureate) Ryoji Noyori ACES (Asian Chemical Editorial Societies) Award for his distinctions in research in luminescent materials, catalysis, and bioinorganic chemistry as well as exceptional contributions to the development of chemistry. He was chosen among a large number of first-class researchers in Australia and Asia, covering all the major Asian countries including China, Japan, Korea, India, etc. He was the inaugural recipient of this new award and the only one honoured this year. The award was presented at an ACES symposium at the Asian Chemical Congress in July 2017.
- (l) Professor P.K.H. Tam, Chair of Paediatric Surgery and Li Shu-Pui Professor in Surgery, was presented the Denis Browne Gold Medal by the British Association of Paediatric Surgeons (BAPS) in a ceremony held during BAPS’s Annual International Congress in July 2017. The medal is the highest honour awarded by BAPS, one of the oldest and most established paediatric surgical associations in the world. The award is made on an annual basis to one individual from worldwide nominations. Professor Tam is the first surgeon in Hong Kong – and the fourth surgeon in Asia – to be presented with this prestigious award since its inception in 1968.
- (m) Professor K.M.Y. Leung of the Swire Institute of Marine Science and School of Biological Sciences was awarded the 19th Biwako Prize for Ecology jointly by the Government of Shiga Prefecture and the Ecological Society of Japan. An award presentation ceremony was held at the Lake Biwa Museum in Japan. This award aims to recognise outstanding ecologists, under the age of 50, who have made academically and socially significant achievements in the field of aquatic ecology in Asia, and demonstrated great potential to become a central figure in ecology.
- (n) Twelve HKU academics have been named among the world’s top scientists whose work has been highly cited by fellow academics and are hence making a significant impact in ongoing research in their respective fields of study. The HKU academics featured in Highly Cited Researchers from

Clarivate Analytics – an annual list recognising leading researchers in the sciences and social sciences from around the world – in 2017 are Professor Y. Guan, Professor J.S.M. Peiris and Professor L.L.M. Poon from the School of Public Health; Professor J. Lam and Professor D.Y.C. Leung from the Department of Mechanical Engineering; Professor T.W. Lam and Dr S.M. Yiu from the Department of Computer Science; Professor N.P. Shah from the School of Biological Sciences; Professor M. Sun and Professor G. Zhao from the Department of Earth Sciences; Professor K.Y. Yuen from the Department of Microbiology; and Professor K.Z. Zhou from the Faculty of Business and Economics.

- (o) Six of the eight awards in the Fulbright-RGC Hong Kong Research Scholar Award 2017-18 went to HKU RPs, who received total funding of HK\$0.6 million. The programme enables PhD candidates to conduct research in elite institutions in the US. Over the past five years, HKU RPs have received 20 of the 38 awards, receiving HK\$2 million of the HK\$3.7 million funding, more than any other local institution.
- (p) HKU RPs secured top awards in the “Challenge Cup” National Competition Hong Kong Regional Final – Hong Kong University Student Innovation and Entrepreneurship Competition 2017, including (i) the Grand Award in Entrepreneurship and the First Place Award of the Start Up Sub-Category for 42Lab, a portable hardware platform for biotechnology experiments developed by PhD graduate Dr C.K. Ng (Department of Physics) and PhD student H.F. So (School of Biomedical Sciences); and (ii) the First Place Award under the Innovation – Energy and Chemical Engineering Category for a nanomotor configured with tunable spectral response developed by J. Wang, J. Zheng, Z. Xiong and B. Dai, PhD candidates in the Department of Chemistry. HKU also received the Outstanding Participating Award.
- (q) HKU sixth-year medical student H.M. Lai won first prize in the “Challenge Cup” National Undergraduate Curriculum Academic Science and Technology Works competition. He developed a solution called OPTIClear, which can turn tissues transparent. It allows researchers to take 3D images using optical tomography and could shorten the time taken to unveil the function of various tissues and help researchers study cancer cells and the pathology and cause of Alzheimer’s disease. Lai has applied for a patent for the technology. As well as this first prize, HKU students won a second prize and three third prizes in the competition.
- (r) Dr M. Adeel, a PhD graduate from the Department of Urban Planning and Design, won the Cooperation for Urban Mobility in the Developing World (CODATU) Prize for the best PhD thesis with his thesis “Transportation Disadvantage and Social Exclusion in Pakistan”. Under the supervision of Professor A.G.O. Yeh, Dr Adeel’s study revealed that gender, income and residential location are the three most important determinants of transportation disadvantage and social exclusion in Pakistan. Dr Adeel is a successful example of HKU’s Internationalization Postgraduate Studentship programme in carrying out research in other international regions outside Hong Kong.
- (s) An HKU team was awarded Best Live Demonstration Prize at the Surgical Robot Challenge in London, a world-renowned event to showcase the latest

innovations in the field of surgical robotics that is organised by the Engineering and Physical Science Research Council and the UK Robotics and Autonomous Systems Network. The HKU team was shortlisted to participate in the final round of the challenge, in which a newly developed catheter robot was demonstrated. The HKU team involved undergraduate, MPhil and PhD students – P.T. Chan, M. Leong, C. Cheung, B. Lee, Z. Guo and Z. Dong – as well as a postdoctoral fellow, Dr D. Fu, who are advised by Dr K.W. Kwok of Mechanical Engineering.

- (t) K.K.H. Wong, a Year 4 Bachelor of Arts student in the Urban Studies programme, won an international geographic information systems (GIS) award with research on traffic noise pollution in Western District, Hong Kong. The award is the Esri Young Scholars Award 2017, received at the 2017 Esri User Conference in the USA in July, attended by over 16,000 scholars and representatives from the GIS industry worldwide. His work represented Hong Kong and was displayed alongside that of other Young Scholar winners from around the world.
- (u) Team DAELead from the Department of Mechanical Engineering was awarded champion of the Airbus Fly Your Ideas 2017 global student competition. Their private stowage compartment design – an effective and innovative storage space underneath passengers’ feet – beat 364 entries by around 5,500 participants from all over the world. The team spent a week at the Airbus ProtoSpace facility in Toulouse, France to compete against four other shortlisted teams from Australia, France, Nigeria and the UK. DAELead team members included D.K.W. Li, L.K.Y. Lo, S.S.W. Leung, and H.H.T. Li, along with Dr C.K. Chan, Lecturer of the Department of Mechanical Engineering.

Outstanding Researcher Award Scheme

90. HKU’s annual Outstanding Researcher Award Scheme recognises the excellent work of the University’s researchers. At a ceremony on March 27, 2017, the following awards, for research achievements during and prior to the report period, were presented:

(i) *Outstanding Researcher Award*

Professor S.C.W. Tang, Department of Medicine
Professor G. Zhao, Department of Earth Sciences
Professor K.Z. Zhou, School of Business

(ii) *Outstanding Young Researcher Award*

Dr X.D. Li, Department of Chemistry
Dr J.A. Tanner, School of Biomedical Sciences
Dr P.J. Yap, Department of Law
Dr H. Zhu, School of Public Health

(iii) *Outstanding Research Student Supervisor Award*

Professor X. Guan, Department of Clinical Oncology
Professor K.M.Y. Leung, School of Biological Sciences

91. As an enduring reminder of the remarkable performances of HKU scholars, a new Plaque of Honour has been created and installed on the lower ground floor of the Centennial Campus. The Plaque is engraved with the names of recipients of these research awards (including the Distinguished Research Achievement Award) over the years alongside the

Knowledge Exchange Excellence Award (see paragraph 67(a)) and a number of teaching awards. The Plaque of Honour Unveiling Ceremony, attended by over 100 awardees from over the years, was held immediately before the Award Presentation Ceremony.

92. The Faculty-level Research Output Prize, part of the Outstanding Researcher Award Scheme since 2005, rewards the author (or team of authors) for a single outstanding item of research output (such as a publication, artistic production or patent). An output item is selected by each Faculty annually for the prize, and Faculties can determine the research output form that best represents their research achievement. The following 9 Research Output Prizes were awarded in the reporting year:

Faculty of Architecture: “Measuring Polycentric Urban Development in China”, *Regional Studies*, March 3, 2015 (published online), by Xingjian Liu, Ben Derudder and Kang Wu

Faculty of Arts: “Youth and Empire: Trans-Colonial Childhoods in British and French Asia”, *Stanford University Press*, Stanford, CA, 2015, 416pp., by David M. Pomfret

Faculty of Business and Economics: “Product market competition, R&D investment, and stock returns”, *Journal of Financial Economics*, 2016 (published online in 2015), Vol. 119, No. 2, pp. 441-455, by Lifeng Gu

Faculty of Dentistry: “The Interplay of Dental Pulp Stem Cells and Endothelial Cells in an Injectable Peptide Hydrogel on Angiogenesis and Pulp Regeneration *In Vivo*”, *Tissue Engineering: Part A*, 2015, Vol. 21, Numbers 3 and 4, pp. 550-563, by Waruna Lakmal Dissanayaka, Kenneth M. Hargreaves, Lijian Jin, Lakshman P. Samaranyake and Chengfei Zhang

Faculty of Education: “Excellence in University Assessment: Learning from award-winning practice”, *Routledge*, London, 2015, 270pp., by Liz Jackson

Faculty of Engineering: “MEGAHIT: an ultra-fast single-node solution for large and complex metagenomics assembly via succinct *de Bruijn* graph”, *Bioinformatics*, 2015, Vol. 31, No. 10, pp. 1674-1676, by Dinghua Li, Chi-Man Liu, Ruibang Luo, Kunihiko Sadakane and Tak-Wah Lam

Faculty of Law: “Constitutional Dialogue in Common Law Asia”, *Oxford University Press*, Oxford, UK, 2015, 244pp., by Po Jen Yap

Li Ka Shing Faculty of Medicine: “Topical imiquimod before intradermal trivalent influenza vaccine for protection against heterologous non-vaccine and antigenically drifted viruses: a single-centre, double-blind, randomised, controlled phase 2b/3 trial”, *The Lancet Infectious Diseases*, February 2016 (published online in 2015), Vol. 16, Issue 2, pp. 209-218, by Ivan Fan-Ngai Hung, Anna Jinxia Zhang, Kelvin Kai-Wang To, Jasper Fuk-Woo Chan, Patrick Li, Tin-Lun Wong, Ricky Zhang, Tuen-Ching Chan, Brian Chun-Yuan Chan, Harrison Ho Wai, Lok-Wun Chan, Hugo Pak-Yiu Fong, Raymond Kar-Ching Hui, Ka-Lun Kong, Arthur Chun-Fung Leung, Abe Ho-Ting Ngan, Louise Wing-Ki Tsang, Alex Pat-Chung Yeung, Geo Chi-Ngo Yiu, Wing Yung, Johnson Y-N Lau, Honglin Chen, Kwok-hung Chan and Kwok-Yung Yuen

Faculty of Social Sciences: “Different outcomes of never-treated and treated patients with schizophrenia: 14-year follow-up study in rural China”, *The British Journal of Psychiatry*, 2015, Vol. 207, No. 6, pp. 495-500, by Mao-Sheng Ran, Xue Weng, Cecilia Lai-Wan Chan, Eric Yu-Hai Chen, Cui-Ping Tang, Fu-Rong Lin, Wen-Jun Mao, Shi-Hui Hu, Yue-Qin Huang and Meng-Ze Xiang

Major International Research Events

93. A range of important international research conferences were organised by HKU in the 2016–17 reporting period, including the following:

- (a) August 25–27, 2016 – the International Symposium on Sustainable Rural Communities in Asian Cities, organised by the Faculty of Social Sciences, provided a platform for the sharing of knowledge and experience on the revitalisation of rural communities in Asian cities. The Symposium showcased 20 world famous rural revitalisation efforts in Asia, including cases on UNSECO World Heritage Sites. Scholars and practitioners from Nepal, Japan, South Korea, Mainland China, Taiwan and Hong Kong shared their knowledge and experience with over 200 participants. The event also saw the official launch of the Faculty’s new initiative, the Policy for Sustainability Lab, established to address the United Nations’ 17 Sustainable Development Goals through action research and cross-sector partnerships
- (b) November 3–4, 2016 – the 3rd International Conference on Phase 1 and Early Phase Clinical Trials, organised by the Clinical Trials Centre of HKU, brought together experts from North America, Europe and Asia to share their insight and wisdom on the latest trends in key areas. This global event attracted around 300 clinical research professionals, including delegates from academic/medical institutions, regulatory/governmental bodies and the pharmaceutical industry, and provided a platform to exchange views and opinions on the latest trends in early clinical research and drug development in Asia and around the world.
- (c) December 6–8, 2016 – the 2nd Interdisciplinary Symposium on Ocean Acidification and Climate Change (ISOACC), co-organised with the University of Glasgow, brought together scientists with a strong interest in multidisciplinary collaboration in marine climate change research. Invited speakers came from more than 15 countries in Asia, Europe, North America, and Australia and New Zealand from multiple scientific disciplines such as marine biology/ecology, oceanography, molecular biology, biomineralisation, biomedical sciences and mechanical engineering.
- (d) January 5–7, 2016 – the 10th Asia GIS Conference with the theme of “Future Smart Cities” was held in Hong Kong and organised by the Asia GIS Association, the Hong Kong GIS Association, the Centre of Urban Studies and Urban Planning, HKUrbanLab and the GIS Research Centre of HKU. The Conference provided a forum to share research and applications of the use of GIS in the development of smart cities as well as to discuss its use for developing future smart cities that can improve people’s livelihood in future cities.
- (e) February 24–25, 2017 – the 1st International Conference on Legal and Healthcare Interpreting was hosted by the School of Chinese in collaboration with the Auckland University of Technology (New Zealand). The conference brought together participants from across the world and enabled scholars to present their research findings in interpreting studies as well as allowing educators to exchange pedagogical ideas in interpreter education.
- (f) March 10–11, 2017 – the HKU-NUS-STANFORD Conference in Statistical Science and Data Analytics conference – which marked the 50th Anniversary of HKU Statistics and Actuarial Science – highlighted new frontiers including

data-driven statistical science and decision analytics, and touched on different related fields such as quantitative finance and actuarial science. It featured distinguished speakers from both academia and industry to foster interaction.

- (g) May 12, 2017 – a 1-day symposium on “Citations, Impact & International Ranking” was hosted by HKU with support from Elsevier to engage in knowledge sharing and critical discussion of developments, challenges and potential solutions of higher education institutes. It was attended by about 200 international and Hong Kong delegates. <http://www.rss.hku.hk/links-resources/spotlight/colloquium>
- (h) June 19–21, 2017 – a 3-day international conference on “Transmission of respiratory viruses: from basic sciences to evidence based options for control” (Transmission Conference 2017) was hosted by the WHO Collaborating Centre for Infectious Disease Epidemiology and Control at the School of Public Health, Li Ka Shing Faculty of Medicine. The conference was attended by over 160 healthcare policy leaders, clinical practitioners, scientists, academics and students.

International Rankings

94. The University stands among the world’s top universities, ranking 26th and 40th in 2017/18 by Quacquarelli Symonds (QS) and Times Higher Education (THE), respectively. In the QS 2017 subject rankings, HKU was ranked in the top 50 for 29 subjects, including 6 top-ten subjects (architecture, linguistics, civil and structural engineering, dentistry, education and training, and social policy and administration), and a further 5 with top-20 placings. For the second year in a row, HKU’s Faculty of Dentistry was ranked first in the scholastic ratings of dental schools around the world. HKU’s overall ranking in Social Sciences and Management was 11th in 2017, and Arts and Humanities jumped from 19th in the world in 2016 to 13th in 2017. In the THE World University Rankings by Subject 2018 (released in autumn 2017), HKU was the only university in Asia to be ranked in the top 10 for Education (ranked 4 after Stanford, Harvard, and Oxford) and in the top 20 for Law (ranked 18).

95. In 2017, HKU was again ranked the third most international university in the world – and the highest in Asia – by THE. The ranking is compiled using the results of the “international outlook” indicator in the THE 2016–17 World University Rankings, covering international staff, students and co-authors, and also includes a measure of universities’ international reputations, based on THE’s annual Academic Reputation Survey. In the 2017 THE World Reputation Rankings – based on an invitation-only survey of leading academics – HKU rose 6 places to 39th in the world.

6. Conclusions

96. HKU researchers have continued to demonstrate excellence in research and they are making their mark locally, regionally and globally. Guided by the [3+1] vision and purposeful strategies, the University aims to support their vital and cutting-edge work in an environment that promotes **internationalisation**, **innovation** and **interdisciplinarity** and a commitment to making a positive **impact** on technology and society.

97. Whilst the University is proud of its achievements to date, it remains determined to

enhance and expand its research strengths and foster a robust culture for the creation, application and transfer of knowledge. The University has injected an extra sense of dynamism in developing an innovative culture in its research system.

98. The University's strategic intent is to build peaks of excellence, develop synergistic partnerships and deliver community value. An integrated set of mechanisms – including diverse funding, international alliances, community projects, local and global internships, mainland collaboration, corporate partnerships, and strategic themes in key emerging areas – will enable HKU to form a competitive edge. Key goals in the University's research development include

- (a) To grow and sustain target key areas for HKU's research to be world leading, including areas that are of strategic importance to Hong Kong (such as Smart City, Fintech and Active Ageing),
- (b) To strengthen the translational capabilities of the research in HKU in areas of needs and opportunities, such as Fintech, Healthtech and Big Data,
- (c) To develop HKU as a major hub in Asia for innovation and entrepreneurship, with the University's new Innovation and Entrepreneurship Hub, iDendron, serving as the key enabling platform for fostering holistic development,
- (d) To use the research platforms of HKU in the mainland, notably HKU-ZIRI in Hangzhou as well as HKU-SIRI and HKU Shenzhen hospital in Shenzhen, to fully develop translational research and our innovation potential,
- (e) To provide global opportunities for all HKU graduate students through academic, research, industry and cultural immersion, and
- (f) To enhance collaboration with other universities, public bodies and private enterprises to co-develop deep capabilities and strive for sustainable impact.