HKBU

ANNUAL REPORT 2016-17

Knowledge Transfer Office

香港浸會大學
HONG KONG BAPTIST UNIVERSITY

Global Partnership with UC Berkeley

"Byrdes of on kynde and color flok and flye allwayes together."

— William Turner, 1545, *The Rescuing of Romish Fox*

BIRDS OF A FEATHER FLOCK TOGETHER

How entrepreneurship at HKBU is attracting like-minded partners from near and afar

— Alfred TAN, Kylie WONG, Becky POON

The proverb 'birds of a feather flock together' has been used since the mid-sixteenth century. This proverb usually carries the meaning of those of similar taste or beliefs congregate in groups. Ornithologists explain that in nature, birds of a single species frequently form flocks. So is the tendency of entrepreneurial minds and entrepreneurs.

Global Engagement — Hong Kong Baptist University (HKBU) Partners with University of California at Berkeley (UC Berkeley)

On 21 April 2017, HKBU and UC Berkeley signed a Global Partnership agreement to foster technological innovation and entrepreneurship education. The auspicious event was marked with the inaugural HKBU Entrepreneurship Bootcamp, a four-day immersive entrepreneurship boot camp run by faculties from both Sutardja Center for Entrepreneurship and Technology (SCET), as well as UC Berkeley and the Knowledge Transfer Office (KTO) at HKBU. A total of 11 UC Berkeley and 29 HKBU students from a mix of disciplines (Figure 1) took on this mind-provoking challenge. Among the HKBU students, 12 won a once-in-a-lifetime chance to attend the UC Berkeley Method of Entrepreneurship Bootcamp, which will be held in August 2017. This Global Partnership between HKBU and UC Berkeley will open up an avenue for HKBU students to travel and study overseas through student exchange during their four-year university studies at HKBU. For more information, see excerpts from the reflections of both UC Berkeley and HKBU students in Annex 1A of HKBU Annual Report 2016–17. A short video clip of the HKBU Entrepreneurship Bootcamp is also available for viewing at: http://hkbutube.lib.hkbu.edu.hk/ov/display.php?id=10073 .

Berkeley student working with HKBU students at HKBU Entrepreneurship Bootcamp

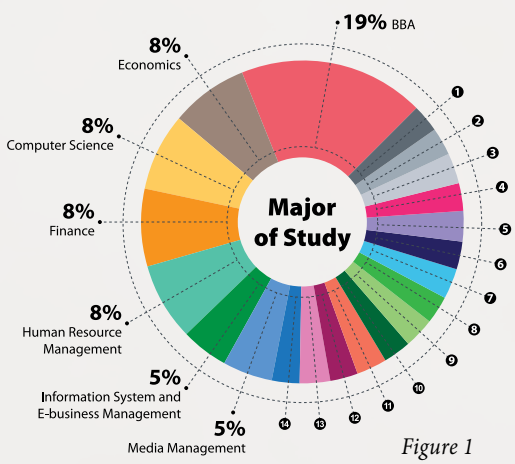


Figure 1

Digital Enrichment — A Massive Open Online Course (MOOC) - styled Online-to-Offline Entrepreneurship Programme

Our collaboration in entrepreneurship with UC Berkeley started a few years ago, with one recent achievement being a MOOC-styled online-to-offline entrepreneurship programme entitled *'BEST1001 — Berkeley Method of Entrepreneurship in Hong Kong'*, which was co-developed by KTO at HKBU and Professor Ikhlaq SIDHU, Chief Scientist and Founding Director of SCET at UC Berkeley. For the academic year 2016–17, the BEST1001 online training module is offered campus-

wide on HKBU's e-learning platforms — HKBU Moodle and School of Continuing Education (SCE) Moodle. As of 27 June 2017, the number of students who have accessed the BEST1001 module on HKBU Moodle and SCE Moodle were 5,028 and 2,393, respectively. Among them, 94 students have completed the training module on HKBU Moodle and 26 students have completed the training module on SCE Moodle. Figure 2 shows that HKBU students from various disciplines found the entrepreneurship education of BEST1001 to be of interest. For more information, see excerpts from the reflections of HKBU students who have completed the BEST1001 in Annex 1B of HKBU Annual Report 2016–17. A short video clip introducing the *BEST1001 — Berkeley Method of Entrepreneurship in Hong Kong* is also available for viewing at: http://hkbutube.lib.hkbu.edu.hk/ov/display.php?id=10062 .

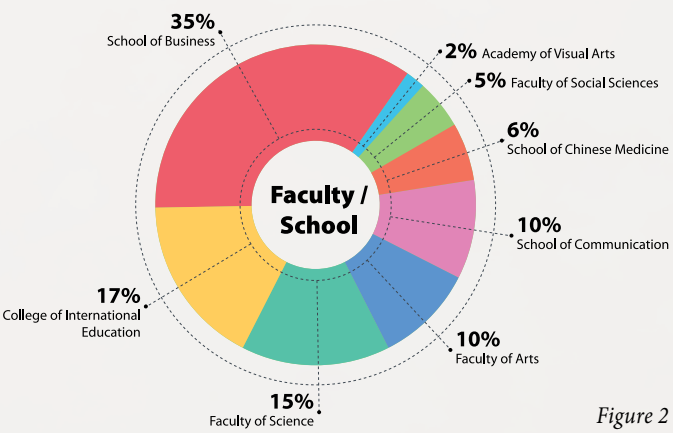


Figure 2

Local Empowerment — The Young Entrepreneurs' Club (YEC)

Having seen many successful cases of students' entrepreneurship sprouting from the Business Entrepreneurship Support and Training (BEST) programme and from the Entrepreneurship and Innovation Centre (EIC) at our School of Business, Professor SHIH Wing-ching kindly donated HK$1,000,000 to HKBU to support the foundation of a Young Entrepreneurs' Club. The YEC, under the HKBU BEST programme, aims to provide a platform for successful regional and Hong Kong young entrepreneurs to share their multitude of entrepreneurial experiences with our HKBU students. The nine founding members of YEC are: Mr Stan TANG, Chairman of Stan Group; Ms Chloe SUEN, Chair of Simon Suen Foundation; Mr William SHUM, Founder and CEO of Memorigin Watch Company Limited; Mr Robert CHAN, General Manager of ACT Foods

(Shenzhen) Limited; Mr Samuel LAM, Co-Founder and CEO of X Social Group Limited; Mr Aaron LEE, Founder and Managing Director of Dash Serviced Suites; Mr Jimmy TAO, Managing Director and CEO of Vitargent International Holdings Limited; Mr Tommy CHAN, Senior Director of Tai Hing Worldwide Development Limited; and Mr Timothy YU, Founder and CEO of Snapask. This dynamic network of successful local young entrepreneurs has empowered the young entrepreneurial minds at HKBU to greater opportunities. Since its founding on 1 December 2016, the YEC has held a multitude of entrepreneurial activities including, but not limited to, a talk on the F.O.C.U.S.E.D.+ framework by Dr Robert WRIGHT, the HKBU Entrepreneurship Bootcamp, the YEC Networking Dinner and the Recognition Ceremony for Donation by Professor SHIH Wing-ching, JP cum Celebrating the Formation of the Young Entrepreneurs' Club. More information of these events can be found in Annex 1C of HKBU Annual Report 2016-17. A short video clip documenting the formation of this Young Entrepreneurs' Club is also available for viewing at: http://hkbutube.lib.hkbu.edu.hk/ov/display.php?id=10078 .

+ F – FRESH perspective
O – Think, feel and act like an OWNER
C – Show CONNECTED thinking
U – Have a sense of URGENCY
S – Show team SPIRIT
E – Always ENGAGED
D – Exercise DELIBERATE practice

Focused Entrepreneurship — The HKBU Business Entrepreneurship Support and Training (BEST)

The university-funded HKBU BEST programme is operating in its fifth year since its founding. Over these last five years, 3,496 students have participated in at least one BEST entrepreneurship activity. If online BEST trainings are taken into account, the total number of HKBU students who have benefitted from HKBU BEST rises to 10,917 students. This amounts to an average of 2,184 HKBU students per annum benefitting from the entrepreneurial support and training provided by KTO via HKBU BEST. In the academic year 2016–17, HKBU BEST has organised a total of 10 entrepreneurship seminars, two entrepreneurship competition workshops, five entrepreneurship-training activities and three entrepreneurship events. In addition, it co-hosted 10 entrepreneurship activities together with external parties, such as Hong Kong Trade Development Council, MIT Hong Kong Innovation Node, Our Hong Kong Foundation, The Hong Kong Federation of Youth Groups, Hong Kong X-Tech Startup Platform, Hong Kong Science and Technology Parks Corporation and Hong Kong Cyberport Management Company Limited. HKBU BEST has also supported the student-organised HKBU Entrepreneurship Society to host five entrepreneurship activities on campus, including the Entrepreneur Bazaar, the HKBU Startup Weekend and the BEST Marketing Promotion Campaign. To further promote our extensive list of entrepreneurship support and training services to HKBU students, KTO has also recruited 15 keen entrepreneurs and young students to serve as BEST ambassadors. The vibrant entrepreneurial culture on campus is evidenced by the growing number of entrepreneurial competitions and awards won by our students in both local and regional competitions. For more information, please see examples of entrepreneurial competitions and awards won by HKBU students in Annex 1D of HKBU Annual Report 2016–17. A short video clip introducing an example of our on-campus entrepreneurship competition workshop — *the First Elevator Pitch Challenge at HKBU* — is also available for viewing at: http://hkbutube.lib.hkbu.edu.hk/ov/display.php?id=10061 .

Birds of a Feather Flock Together

By focusing on doing well and doing good in nurturing entrepreneurship on campus, the HKBU BEST programme has successfully developed a vibrant entrepreneurial culture at HKBU. Our entrepreneurial students and their extraordinary achievements have attracted the attention of local businesses and supportive donors. The positive responses will further empower our concerted efforts on providing the best entrepreneurship education and experiences at HKBU. Our good work is set to attract the best global partners in entrepreneurship education — and this ultimately exemplifies that birds of a feather do indeed flock together.

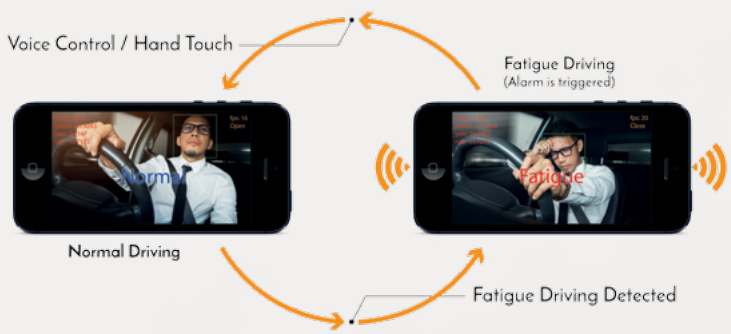
STRATEGIC IP PROTECTION AND PURPOSEFUL COMMERCIALISATION

A purposeful focus on building, marketing and commercialising IP portfolios of HKBU on the global market leads to great success
— Mandy LIU, Kate CHEUNG

GOING GLOBAL – A TESTIMONY TO WINNING TOP PRIZES IN GENEVA

Following the success of winning the Grand Prix, two gold medals and two special awards at the 44th International Exhibition of Inventions of Geneva held in Switzerland last year, a delegation from HKBU has swept nine top prizes, including two Grand Prizes, four gold medals (two with distinction) and three special awards, at the 45th International Exhibition of Inventions of Geneva held from 29 March to 2 April this year. This is the second year HKBU participated in this prestigious international event. For two years running, HKBU is the only institution or participant from Hong Kong wherein all projects submitted were awarded top prizes.

HKBU submitted four entries this year. The winning projects are:



the Fatigue Driving Detection and Alarm System invented by Professor CHEUNG Yiu-ming, which uses a smartphone to capture real-time video of the driver, as well as detection and tracking technologies to analyse his facial expression and head pose. An alarm is automatically set off to alert the driver when symptoms of drowsiness are observed. The invention won a gold medal with distinction in the computer science category, as well as the Swiss Automobile Club Prize. A short video clip of *the Fatigue Driving Detection and Alarm System* is also available for viewing at: http://hkbutube.lib.hkbu.edu.hk/ov/display.php?id=10069 .

the Portable Gait Analyser invented by Professor Jeffrey CHEUNG Tai-kin, which assesses the way people walk and highlights their biomechanical abnormalities. It is also used in sports biomechanics to help athletes run more efficiently and to identify posture-related or movement-related problems for people with injuries. The new method puts a single sensor behind a patient's waist and requires the patient to walk 20 steps. Compared with traditional methods that use up to 15 cameras and take hundreds of pictures, this invention is simpler, faster and cheaper. It won a gold medal with distinction in the sports category, as well as the Prize of the Romanian Association of Nonconventional Technologies (special medal). A short video clip of *the Portable Gait Analyser* is available for viewing at: http://hkbutube.lib.hkbu.edu.hk/ov/display.php?id=10065 .

the Portable Balance Scale also invented by Jeffrey, which measures people's balance index to reduce their risks of falling over. By analysing the body's moving amplitude when it tries to maintain balance on an unstable platform, the specific index value can then be measured. The greater the amplitude, the higher the index; and a high index indicates poor balance capability. The whole measurement process is as simple as stepping on a scale. The invention won a gold medal in the sports category, as well as the Prize of the Romanian Association of Nonconventional Technologies (special medal). A short video clip of *the Portable Balance Scale* is available for viewing at: http://hkbutube.lib.hkbu.edu.hk/ov/display.php?id=10067 .

the Lanthanide Toolbox invented by Dr Gary WONG Ka-leung, a primary cilium marker that detects Joubert syndrome and an emerging class of genetic disorders called ciliopathy. The reagent can provide test results in a mere six hours and at a fraction of the cost of current technologies. The measurement process is much simpler because it operates under normal conditions and can achieve 100% accuracy. The invention clinched the gold medal in the medicine category, the International Innovation Award of the Polish Academy of Science Institute of Genetics and Animal Breeding (special Medal), as well as the Prize of the Malaysian Association of Research Scientists. A short video clip of *the Lanthanide Toolbox* is available for viewing at: http://hkbutube.lib.hkbu.edu.hk/ov/display.php?id=10075 .

"The award-winning inventions are all from high-impact research areas that tackle global real-world problems, such as fatigue-related road accidents, for which many researchers across the world have been working hard to come up with solutions. HKBU researchers have found solutions that promise great commercialisation potential. HKBU students and researchers have yet again demonstrated that Hong Kong's innovative R&D achievements are highly regarded by international experts."

Professor Roland CHIN,
President and Vice-Chancellor of HKBU

For further details of the first three projects, please see Annexes of HKBU Annual Report 2015–16 (http://kto.hkbu.edu.hk/publication/AR201516_Annex/#p=6). For further details of Lanthanide Toolbox, please see Annex 2A of Annual Report 2016–17.

A short video clip on the Exhibition is also available for viewing at: http://hkbutube.lib.hkbu.edu.hk/ov/display.php?id=10074.

STRENGTHENING OUR KEY RESEARCH — EVIDENCE FOR OUR SUCCESS IN RUNNING KNOWLEDGE TRANSFER PROGRAMMES

Matching Proof-of-Concept Fund (MPCF) supported by the Knowledge Transfer Committee, which aimed at bridging the gap between IP rights of HKBU and the commercialisation of technologies in start-up companies or the industry, was launched in 2013–14 and had been in operation for more than four years. MPCF focuses on technological areas that are of key economic benefits to society and in line with the key research strengths of HKBU. The scheme operates on a three-dollar-to-one (3:1) matching basis up to a cap of HK$200,000 per project. For example, a grant of HK$150,000 from MPCF is to be matched by HK$50,000 from the applicant. The successful rate has doubled compared to last year. Examples of successful cases include:

- eight technology start-up companies supported by the Technology Start-up Support Scheme for Universities (TSSSU) under the governance of the Innovation and Technology Commission (ITC)
- the winning of prestigious awards at the 44th and 45th International Exhibition of Inventions of Geneva
- successful deals in IP licenses. The table below shows the list of MPCF projects in the reporting period (project summaries are provided in the Annexes 2B–2D).

Membership and Composition of Knowledge Transfer Committee

Chairman
Prof Frank FU Hoo-kin,
Associate Vice-President
Chair Professor of Physical Education
(From 1 Jul 2016 to 31 Dec 2016)

Chairman
Prof Rick WONG Wai-kwok,
Vice-President (Research & Development)
(From 1 Jan 2017 to 30 Jun 2017)

Executive Secretary & Ex-Officio Member
Ir Dr Alfred TAN Keng-tiong,
Head of Knowledge Transfer Office

Ex-Officio Members
Prof Rick WONG Wai-kwok,
Vice-President (Research & Development)
(From 1 Jul 2016 to 31 Dec 2016)

Prof Gordon TANG Yu-nam,
Director of Student Affairs

Senior Academic Members

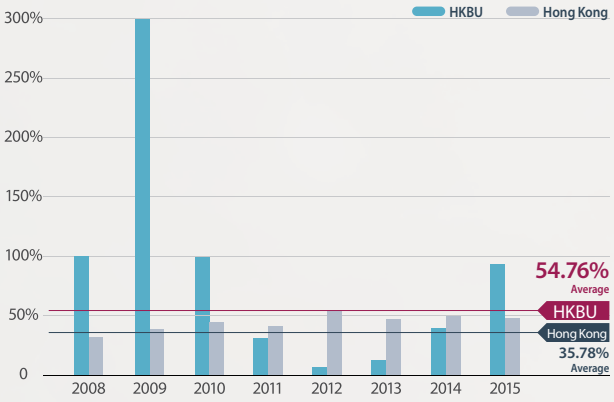
Faculty of Arts	**Dr Ester LEUNG Sin-man,** *Associate Professor of English Language and Literature*
Faculty of Science	**Prof Ricky WONG Ngok-shun,** *Associate Vice-President (Teaching and Learning), Chair Professor of Biology*
Faculty of Social Sciences	**Prof MA Hing-keung,** *Professor of Education Studies*
School of Business	**Mr Simon SO Kwan-kow,** *Associate Programme Director of Bachelor of Business Administration (Hons)*
School of Chinese Medicine	**Prof BIAN Zhao-xiang,** *Associate Vice-President (Chinese Medicine Development), Director of Clinical Division*
School of Communication	**Prof Kara CHAN Ka-wah,** *Professor of Communication Studies*
Academy of Visual Arts	**Mr Kalen LEE Wing-ki,** *Lecturer of Visual Arts*

Project title	Principal investigator / Department or School	Project start date	Project status	Target completion date
 Development of lead ion-testing paper with naked-eye observable readout for 10-minute on-site detection	Dr Edmond MA Dik-lung Chemistry	15 August 2016	Ongoing	14 August 2017
 A non-invasive fast diagnostic method for prostate cancer using patients' urine samples	Dr Gary WONG Ka-leung Chemistry	15 August 2016	Ongoing	14 August 2017
 A *Cordyceps sinensis* quality control marker and its use in quick, efficient and low-cost herb authentication	Dr Simon HAN Quan-bin School of Chinese Medicine	15 August 2016	Ongoing	14 August 2017

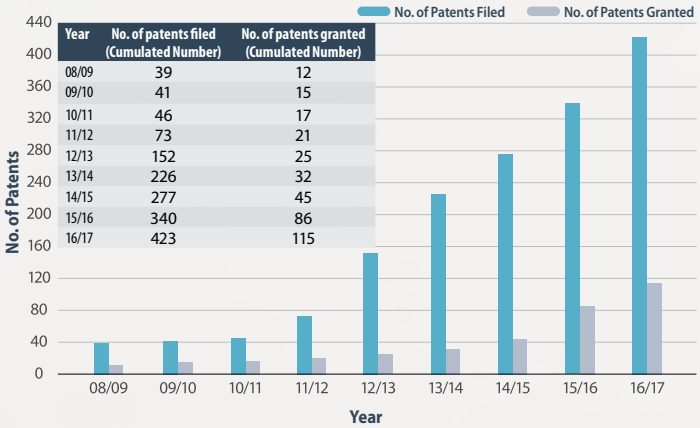
LEADING POSITION IN IP — SETTING A RECORD HIGH PATENT GRANT RATE IN HONG KONG

The success in identification and protection of new technologies at HKBU is attributed to KTO's value — providing professional customer-oriented knowledge transfer services to all whom we serve. Special focus has been given in successful attainment of patent grants and award-winning innovations. This year, HKBU has attained a patent grant rate above the average (i.e., total number of granted patents over filed patents) for a Hong Kong entity according to the World Intellectual Property Organization (WIPO). This is because we focus on quality patent filing applications and strictly follow holistic governance in IP protection set out by the University. With the support of Strategic Patent Fund (SPF) established since the academic year 2013–14, the protected IPs are submitted for international award competitions across many jurisdictions.

Number of Granted Patents / Number of Filed Patents



Cumulative No. of Patents Filed and Granted per Year



Year	No. of patents filed (Cumulated Number)	No. of patents granted (Cumulated Number)
08/09	39	12
09/10	41	15
10/11	46	17
11/12	73	21
12/13	152	25
13/14	226	32
14/15	277	45
15/16	340	86
16/17	423	115

DELIVERING TECHNOLOGY TRANSFER — AN INCREASING NUMBER OF SUCCESSFUL DEALS IN IP LICENSES

By building interpersonal relationships with all stakeholders, HKBU R&D Licensing Limited (HKBURDL), a HKBU wholly-owned company (limited by shares) has successfully licensed a total of 35 patents and two trademarks to 10 companies wherein eight of them are HKBU TSSSU companies. Among these IP licenses, seven IPs created from two research projects have been licensed to one listed company and one private company. Details of these two projects are provided in Annex 2E and Annex 2F. In this reporting year, HKBURDL received a licensing income totalling HK$3.2 million. Such in-house support and good relationship with all stakeholders further facilitated our technology transfer to the community. Our good work and efforts on exhibiting many HKBU inventions at both local and international conventions have enabled us to attract commercial interests for collaborations and making successful licensing deals — which shows that our purposeful focus does lead to great successes. For further details of two highlighted conventions, please see Annex 2G of HKBU Annual Report 2016–17.

(From left to right) Dr Hisayoshi Norimoto, Head of Research & Development (PuraPharm); Prof Justin Wu, Associate Head of Shaw College (CUHK); Prof Roland Chin, President and Vice-Chancellor (HKBU); Prof Walter Ho, Director of Office of Research and Knowledge Transfer Services (CUHK); Dr Alfred Tan, Head of Knowledge Transfer Office (HKBU); Prof Rick Wong, Vice-President (Research & Development) (HKBU); Prof Bian Zhaoxiang, Associate Vice-President and Associate Director of Institute of Creativity (HKBU); Prof Lyu Aiping, Dean, School of Chinese Medicine (HKBU)

IMPACTFUL RESEARCH IMPACTING LIVES

How Knowledge Transfer Partnership Projects at HKBU impacted the everyday lives of a Hong Kong family

— Anna CHAN, Mike NG

HONG KONG — CHEN Xiao-qing, 19, checked her mobile phone on her way back home to Tin Shui Wai. She could not help feeling bewildered yet excited seeing the following message on her phone's newsfeed, 'Click here to watch, tell your family your wish to become an organ donor!'

Enhance Youngsters' Willingness of Family Discussion on Organ Donation by Using Narrative Animation

Dr Timothy FUNG Kai-fung and Dr Kelvin LEE Kai-wah, School of Communication, HKBU

After watching an animation produced by Dr Timothy FUNG Kai-fung and Dr Kelvin LEE Kai-wah, Xiao-qing decided to register as an organ donor and tell her family about her decision. She felt more determined after knowing the Hong Kong Government had adopted the animation in its citywide campaign: 'Say Yes to Organ Donation'. She had seen the government's organ donation promotion vehicle stopping near her home in Tin Shui Wai and attracted numerous visitors. Dashing home, Xiao-qing believed that her decision would be supported by her family members, especially her grandmother, who just went through a roller-coaster battle of cancer recovery. She believed that she should seize the day and take action to help the community.

"I never thought I needed to tell my family I want to be an organ donor. Now I feel like telling everyone!" (Xiao-qing)

A video of the animation *Say your wish, save a life* is available at: https://youtu.be/li3xLVFQ1Dw .

「分甘同味」Sharing Plates: Community Cookbook Collaboration for Holistic Cancer Care

Dr Angela MAK Ka-ying, School of Communication, HKBU
Dr DANG Yi, School of Chinese Medicine, HKBU

At home, Xiao-qing greeted her grandmother, Ma-po, 72, who was reading a new cookbook, by Dr Angela MAK Ka-Ying and Dr DANG Yi, which she had just bought at the Hong Kong Book Fair. She was exploring new recipes that suited her taste buds after a weary battle with cancer.

Being a conservative, Ma-po was surprised when Xiao-qing expressed her intention of becoming an organ donor. "Donating a part of the body?" Ma-po thought. She rarely heard of anyone around her doing it. Nevertheless, as a cancer survivor herself, she knew from first-hand experience how critical it was to receive help in a timely manner. An organ transplantation can mean a new lease of life for another patient-in-need. She often read from newspaper that patients often passed away while waiting for suitable organs.

"As a cancer survivor myself, this cookbook containing cancer care recipes just came in handy!" (Ma-po)

A video of the interview with top chef Ricky CHEUNG is available at: http://hkbutube.lib.hkbu.edu.hk/ov/display.php?id=10070 .

With a supportive pat on Xiao-qing's shoulder, her grandmother encouraged her to tell other family members her decision. In return, Xiao-qing offered to cook dinner, trying one of the dietitian-certified recipes in the cookbook. At the same time, she decided to call her mother.

Transferring Knowledge of Tackling Double Demands Faced by Women Through Training Up Cooperative Organisers

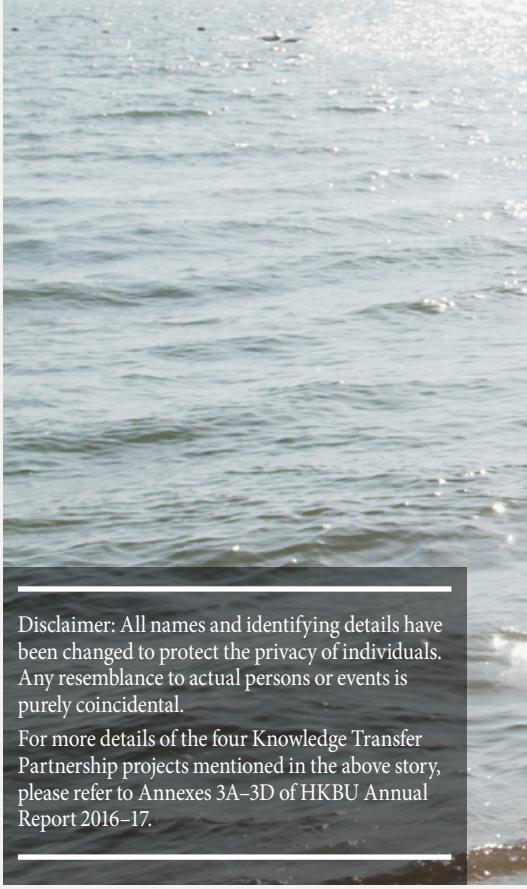
Dr Sam YU Wai-kam, Department of Social Work, Faculty of Social Sciences, HKBU

Buzzed by her phone, Xiao-qing's mother, Hua-lian, 46, took a short break from work and answered the call at a campus canteen.

Just like Xiao-qing's grandmother, her mother acknowledged the importance of giving timely help to those in need. She congratulated Xiao-qing over the phone and urged her to take action. After the call, she pondered over the changes her family has gone through lately: Xiao-qing's grandmother recovered from a long, tough battle with cancer; Xiao-qing's grandfather found out that he had knee arthritis; and her re-entrance into the workforce after years of being a full-time housewife. At first, she found it difficult to get a job because of her education level and the need to look after her family, which made a regular nine-to-five job impossible. Luckily, she was introduced to Dr Sam YU Wai-kam, who recommended her a job opening at the HKBU Shek Mun Campus canteen.

"I feel so empowered now being able to work flexibly and to take care of my family at the same time!" (Hua-lian)

A video clip of the project is available for viewing at: http://hkbutube.lib.hkbu.edu.hk/ov/display.php?id=10081 .



Disclaimer: All names and identifying details have been changed to protect the privacy of individuals. Any resemblance to actual persons or events is purely coincidental.

For more details of the four Knowledge Transfer Partnership projects mentioned in the above story, please refer to Annexes 3A–3D of HKBU Annual Report 2016–17.

The place was operating as a cooperative society and allowed women like Hua-lian to work in flexible hours to meet the double demand of work and family without sacrificing the well-being of either.

Promoting Light Volleyball among Older Adults in Hong Kong

Prof CHUNG Pak-kwong and Dr Carman LEUNG Ka-man, Department of Physical Education, Faculty of Social Sciences, HKBU

Putting down her phone, Xiao-qing felt deeply encouraged by her mother. As she skimmed through the new cookbook, she was amazed by how heart-warming the 12 stories of cancer patients and their caregivers were. Since her grandmother was diagnosed with cancer, it had always been the daily concerns for her whole family. Reading through the stories and understanding what it was like to be a family member of a cancer patient, she felt deeply empathic about the real-life experiences of others in similar predicaments. The cookbook's useful recipes, which were verified by a Chinese medicine practitioner from HKBU and a dietician from Hong Kong Cancer Fund, impressed her.

Meanwhile, Xiao-qing's grandfather, Kam-pak, 74, came back home from his weekly light volleyball class organised by Prof CHUNG Pak-kwong and Dr Carman LEUNG Ka-man. Suffered from knee arthritis, he joined the class to improve his physical and psycho-social health with his senior friends after hearing about this new sport from the HKBU Knowledge Transfer Office (KTO) booth at the Golden Age Expo and Summit (GAES) 2017. Since joining the light volleyball class, his limb mobility and aerobic endurance had greatly improved. With his newfound vigour in life, he was happy to know his granddaughter's wish to become an organ donor. 'Never too late' has always been his life motto and advice to others. Even at his age, he never felt he needed to stop exercising for health. He wished more elderly people in Hong Kong would adopt the same mindset.

"Rebirth is what I would call after joining the light volleyball class. My legs no longer tremble as I walk!" (Kam-pak)

Having heard her family's response, Xiao-qing felt like the happiest girl in the world. She went on with the registration procedures of organ donation. She then eagerly waited for her mother to come home from the cooperative society to try her cooking.

A video of the project is available at: http://hkbutube.lib.hkbu.edu.hk/ov/display.php?id=10079 .

香港浸會大學
HONG KONG BAPTIST UNIVERSITY

KTO 知識轉移處
KNOWLEDGE TRANSFER OFFICE

HKBU R&D LICENSING LTD
浸大科研發展有限公司

REMARKABLE ACHIEVEMENTS BY
HKBU Tech-Heroes

Awards 2017

45th International Exhibition of Inventions Geneva

4 INVENTIONS

❶ A Mobile-based Fatigue Driving Detection and Alarm System
Prof CHEUNG Yiu-ming | COMP

❷ Lanthanide Toolbox
Dr Gary WONG Ka-leung | CHEM

❸ Portable Gait Analyser (GA)
Prof Jeffrey CHEUNG Tai-kin | PHYS

❹ Portable Balance Scale
Prof Jeffrey CHEUNG Tai-kin | PHYS

HKBU

ANNUAL REPORT ANNEXES 2016-17

Knowledge Transfer Office

香港浸會大學
HONG KONG BAPTIST UNIVERSITY

The Fatigue Driving Detection and Alarm System

HKBU Professors Win Nine Top Awards at the 45th International Exhibition of Inventions of Geneva 2017

THE HKBU ENTREPRENEURSHIP BOOTCAMP

In a four-day boot camp held from 21 to 24 April 2017, 29 and 11 like-minded students from HKBU and UC Berkeley teamed up to foster entrepreneurial culture across campus. These like-minded youngsters pitched ideas, attended lectures and participated in interactive workshops organised by UC Berkeley consultants and industry experts.

STUDENT TESTIMONIALS

"For me, the Bootcamp is an important platform to gain cross-disciplinary insights. Without it, I would still be thinking from a narrow perspective."

— Angus CHOW Tsz-shing, a third-year student in Government and International Studies at HKBU

"Having been to many startup boot camps around the world, I have to say that this is by far the most impressive one. The organisation, the diversity and, most importantly, the people were world-class. I will give this boot camp five stars!"

— Kevin TIAN Yuan, a fourth-year student in Business/Mathematics at UC Berkeley

"Thank you KTO for organising this boot camp! Not only did you connect us with UC Berkeley students, you also built bridges between master and undergraduate students within HKBU!"

— David HO Kin-ting , a first-year student in Business Administration at HKBU

"Over the last three days, we learned from our lecturers, as well as listened to mentors and industry specialists. We then engaged in projects, teamed up, came up with ideas, and pitched them before an audience. I never thought I could do so many things in just three days. KTO made it happen."

— Zakson FENG Zhen , a third-year student in BBA Finance at HKBU

"I learned to collaborate with people, contribute to the team, embrace different opinions and, most importantly, become a confident public speaker in any situation."

— Josh TONG Yeung, a fourth-year student in Human Resources Management at HKBU

"I thought the Bootcamp was great! It was very thought-out, organised, and well-executed. The mentors were incredibly helpful and the lectures were great!"

— Kaycee Claire ANTOSIAK, a fourth-year student in Political Economy at UC Berkeley

Twelve HKBU student winners from this boot camp will participate in a five-day boot camp held by one of the premier institutions in Silicon Valley - UC Berkeley in August 2017. There they will have the opportunity to further their entrepreneurial skills.

MOOC-STYLED ONLINE-TO-OFFLINE ENTREPRENEURSHIP PROGRAMME

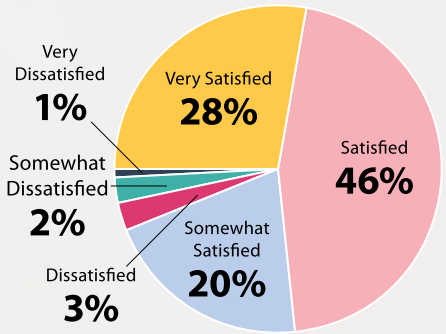
Jointly developed by the Knowledge Transfer Office (KTO) and Professor Ikhlaq SIDHU of the Sutardja Center for Entrepreneurship & Technology (SCET) of University of California, Berkeley, *BEST1001 Berkeley Method of Entrepreneurship in Hong Kong* is our first MOOC• styled online-to-offline entrepreneurship training module for fostering entrepreneurial and innovative minds. As of 27 June 2017, the number of students who have accessed to BEST1001 through HKBU Moodle and SCE Moodle were 5,028 and 2,393, respectively.

• Massive Open Online Course

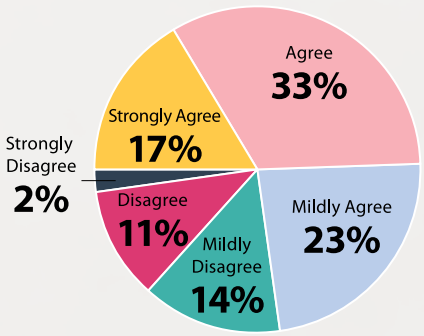
What HKBU students think about BEST1001

1. The online training module was quite good. Students could learn techniques to increase their competitiveness.
2. A good training module to recommend to innovators.
3. Better to have these training modules in every semester!
4. Every business student should take this training module.
5. The training module was very good and fully utilised the Internet. It gave students the flexibility needed to self-study.
6. The training module was useful. It changed my bad behaviours and now I understand my weaknesses.
7. The module changed my mindset and taught me the way to accept new things.
8. The training module gave me a lot of information about entrepreneurship. Many professions shared their experience and knowledge with us. I gained more than I expected.
9. The sharing by local entrepreneurs was helpful. I learned a lot.
10. The content was good and I was really pleased to be taught by a professor from UC Berkeley.
11. The overall design of the training module was attractive and efficient. I learned a lot about innovative mindsets and behaviours.
12. It trained up the minds of students.
13. It was helpful to my career path.
14. The video was informative. It made the concept easy to understand.
15. It was an informative training module to those who wanted to become entrepreneurs.
16. This training module was very applicable to whole person development.
17. This online-to-offline idea was new and a good way for us to learn at our own pace.
18. It was very impressive! I hope KTO will arrange more online training modules like BEST 1001.

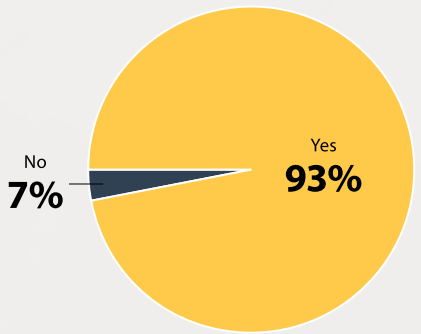
Overall, how would you rate this online training module?



This training module improved my awareness and understanding of the mindset for entrepreneurship and innovation



Will you be interested to join this kind of entrepreneurship online training module again?



THE YOUNG ENTREPRENEURS' CLUB

Thanks to the staunch support and generous donation by Professor SHIH Wing-ching, the Young Entrepreneurs' Club (YEC) was established in December 2016 to support the entrepreneurship ecosystem at HKBU. The mission of YEC is to inspire the spirit of entrepreneurship through education, research, knowledge transfer and community services. A multitude of entrepreneurial events have already been held since the establishment of YEC and there are more exciting events to come!

1 December 2016
Recognition Ceremony for Donation by Professor SHIH Wing-ching, JP cum Celebrating the Formation of the Young Entrepreneurs' Club

A Ceremony to thank Professor Shih and to celebrate the establishment of YEC

28 February 2017
YEC Networking Dinner

First official meeting of YEC with patrons, advisory boards, committee members and young entrepreneurs to sketch out entrepreneurial activities for HKBU students

30 March 2017
Entrepreneurial Talk on F.O.C.U.S.E.D.+ Framework

Dr Robert WRIGHT, Associate Professor of the Hong Kong Polytechnic University (front row, sixth from the left), taught us the way to learn better, faster and more through an innovative pedagogy called 'staying F.O.C.U.S.E.D.'

21–24 April 2017
HKBU Entrepreneurship Bootcamp

Mr Jimmy TAO, YEC Young Entrepreneur and Mr Mark SIU, Committee Member of YEC, gave one-to-one mentoring to students

+ F – **FRESH** perspective
  O – Think, feel and act like an **OWNER**
  C – Show **CONNECTED** thinking
  U – Have a sense of **URGENCY**
  S – Show team **SPIRIT**
  E – Always **ENGAGED**
  D – Exercise **DELIBERATE** practice

HKBU BUSINESS ENTREPRENEURSHIP SUPPORT AND TRAINING (BEST)

BEST provides students with ample opportunities to try hands-on entrepreneurship and commercialisation of ideas. This year, we organised a series of entrepreneurship events for HKBU students, including:

Entrepreneur Bazaar

This was the second Bazaar run by HKBU students, as well as jointly organised by the Entrepreneurship Society and KTO. It offered a platform for students to sell their products and get a taste of running a business.

HKBU Startup Weekend

Startup Weekend was a worldwide event that aimed to build a community of like-minded people for collaboration and sharing. The 54-hour event brought together designers, developers, entrepreneurs and experts from all domains to do amazing things!

BEST Marketing Promotion Campaign

To foster an entrepreneurship culture across campus, a marketing campaign team was formed in February 2017 to promote the *BEST1001 Berkeley Method of Entrepreneurship in Hong Kong*, BEST programmes, as well as HKBU activities.

HKBU Entrepreneur Day

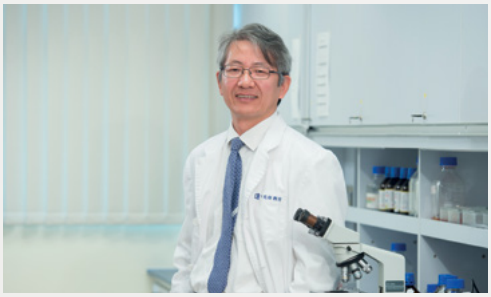
Organised by KTO and co-organised by Hong Kong Trade Development Council (HKTDC), HKBU Entrepreneur Day aimed to celebrate the remarkable achievements of knowledge transfer, innovative research, as well as technology startups.

Three winning teams from the HKBU Entrepreneurship Bootcamp, namely *World Class*, *Homeal* and *Ledo ADs*, also presented their outstanding projects at the event.

The Hon Nicholas W. YANG, JP, Secretary for Innovation and Technology, delivered a keynote speech at the event.

KT Awards 2017

Winner of the Innovationem Award



The Chinese Herbal Medicine for Treating Irritable Bowel Syndrome *by Professor BIAN Zhao-xiang from the School of Chinese Medicine.*

Winning Team of the Knowledge Transfer Award

Enhance Youngsters' Willingness of Family Discussion on Organ Donation by Using Narrative Animation *by Dr Timothy FUNG Kai-fung and Dr Kelvin LEE Kai-wah from the School of Communication, and external partner — the Hong Kong Society of Transplantation.*

Achievements of HKBU students in external startup events and competitions

With regular promotion of entrepreneurship programmes and activities across campus, HKBU students have been more proactive in different external startup events and competitions for exposure and business opportunities.

Remarkable results have been achieved as follows:

Team name / Winner name	Competition / Programme	Achievement
Pair Trade **CHAN Ka-yi** – Year 4, Undergraduate Student, School of Business **CHOY Chun-yat** – Year 4, Undergraduate Student, School of Business **HO Kin-sang** – Year 4, Undergraduate Student, School of Business	Cyberport University Partnership Programme 2016	Selected team to Stanford Graduate School of Business
宏熹醫療有限公司 **余炬成**-五年級，學士，中醫藥學院　**宋佳**-三年級，學士，工商管理學院 **張逸琳**-五年級，學士，中醫藥學院　**王天**-四年級，學士，工商管理學院	2016「創青春」全國大學生創業大賽	創業計劃競賽銀獎
LeDo ADs **KWOK Yuen-yee** – Year 2, Undergraduate Student, School of Communication	第五屆深港澳台（兩岸四地）青年創新創業交流營	創業精英挑戰賽三等獎
	Hong Kong Young Entrepreneur Awards presented by Hong Kong Young Entrepreneur Association	Hong Kong Young Entrepreneur Awards
	The Best Creative Award presented by Hong Kong Young Entrepreneur Association	The Best Creative Award
	HKIEF Roadshow — Hong Kong International Entrepreneur Festival 2016	Top Ten Finalist Award
	Young Entrepreneurs Development Council — Youth Dare to Change Stand-up Pitch Competition	Champion
	Hong Kong Trade Development Council Entrepreneur Day STARTHUB 3.0	Top Ten Investment Value Award
	Best Business Solution in the HKICT Award	Bronze and Best SME Awards
	Hong Kong University Student Innovation and Entrepreneurship Competition — Challenge Cup	Second Prize for Start-up Projects
Happy Farm **PAN Zhiqi** – Year 3, Undergraduate Student, Faculty of Science	MEMSI — MIT Entrepreneurship & Maker Skills Integrator Programme	Most Favourite Product Prize
HomeTaste **CHUNG Ho-yin** – Year 4, Undergraduate Student, Faculty of Science **KONG Chak-ming** – Year 3, Undergraduate Student, School of Business **TSUI Ka-ho** – 2016 Alumni, Faculty of Social Sciences	Good Seed 2016 Cohort 2	Finalist
	The Jockey Club Incubation Programme for Social Innovation	Grantee
	Google EYE (Empowering Young Entrepreneurs) Programme 2016	Final Top 6 Winners
	Cyberport Creative Micro Fund (CCMF)	Grantee
	2017 Young Genius (Hong Kong) Convention cum 2017 Chinese International Invention Expo	Special Gold Award (Champion)
BeThere **WANG Hanyuan** – Year 3, Undergraduate Student, Faculty of Science	MEMSI - MIT Entrepreneurship & Maker Skills Integrator Programme (Summer)	Shortlisted Candidate
Gihon Biotech Limited **PAN Wenhui** – Year 4, PhD Student, School of Chinese Medicine **XIA Yixuan** – Year 2, PhD Student, School of Chinese Medicine	Hong Kong University Student Innovation and Entrepreneurship Competition — Challenge Cup	Second Prize for Start-up Projects
LU Jun – Year 3, PhD Student, School of Chinese Medicine **LIU Jin** – Year 3, PhD Student, School of Chinese Medicine **LI Fangfei** – Year 3, PhD Student, School of Chinese Medicine	Hong Kong University Student Innovation and Entrepreneurship Competition — Challenge Cup	Second Prize for Innovation in Life Sciences
DANG Lei – Year 2, Undergraduate Student, School of Chinese Medicine **LIU Jin** – Year 2, Master Student, School of Chinese Medicine **LI Defang** – Year 3, PhD Student, School of Chinese Medicine	Hong Kong University Student Innovation and Entrepreneurship Competition — Challenge Cup	Third Prize for Innovation in Life Sciences

Annex 2A

A lanthanide toolbox

New markers help uncover the underlying cause of Joubert disease

Imaging reagents that can benefit the lives of people have wide applications in medical diagnostic and life sciences. For instance, GFP-ARL13B is an imaging reagent used in the early detection of a rare genetic disorder called Joubert syndrome. However, the reagent has many drawbacks including exorbitant cost, stringent testing and storage requirements. Dr Gary WONG Ka-leung and his team from Hong Kong Baptist University (HKBU)'s Department of Chemistry have developed a 'lanthanide toolbox' that could overcome all these problems. More importantly, Gary's invention can be applied not only in the early detection of Joubert syndrome, but also in early cancer detection and organelle-specific imaging.

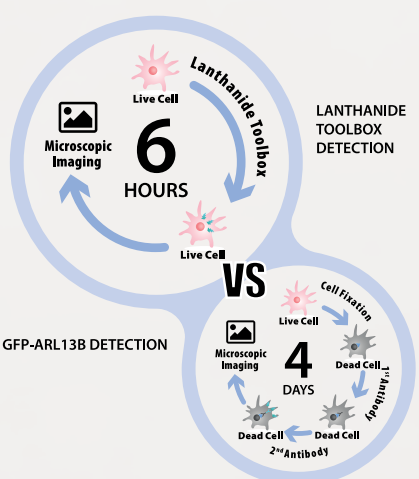
Joubert syndrome is a rare genetic disorder that affects the cerebellum, an area of the brain that controls balance and coordination. About one in every 100,000 babies born in the world is affected. Early detection is helpful because affected children can benefit from physical and occupational stimulations, as well as speech and hearing therapies. Joubert syndrome is a member of ciliopathies, an emerging class of diseases caused by the dysfunction of primary cilia (PC) or the cell's antennae. Current technologies used to detect ciliopathies include GFP-ARL13B, but they have many drawbacks including exorbitant cost (US$1,726 per mg), stringent testing (requiring for cell fixation) and cold storage (below 20 °C) requirements.

The recent resurgence of research on PC was initiated by substantial and overwhelming new evidence in support of their significant correlation with human diseases and developmental disorders. For instance, the dysfunction of PC is strongly correlated with human polycystic kidney diseases, epithelial ovarian cancer and aberrant skeletal development. In addition, the absence of PC and over-expression of proteins nearby have been observed in every stage of pancreatic, breast and prostate cancers.

That said, little is known about the roles of PC due to limitations of conventional imaging methods (e.g., visible-to-near infrared fluorescence imaging and magnetic resonance imaging). PC-specific markers are currently available for the visualisation of mitochondria, Golgi apparatus and lysosome. Until now, however, the visualisation of PC can only be accomplished through immune staining using antibodies or green fluorescent proteins. This is because PC-specific probes are not yet discovered.

To address the above problems, Gary and his team synthesised a compound that specifically targets PC. The new patented technology is not only simple by design, but its quantum yield could reach 10% in water and has a lifetime of 0.56 milliseconds. The new PC-specific marker is able to provide test results in a mere six hours and at a fraction of the cost of existing technology under normal conditions. More importantly, the marker is able to achieve 100% accuracy, whereas GFP-ARL13B has an accuracy of just 80%. Apart from detecting Joubert syndrome, this toolbox can also detect liver, lung and other types of cancer.

In view of its commercial potential, the HKBU Technology Start-up Support Scheme for Universities (TSSSU) has granted Gary a capital to form New Life Medicine Technology Company Limited in January this year. Gary is



Comparison	LANTHANIDE TOOLBOX	GFP-ARL13B
Accuracy	**100%**	80%
Time	**6 hours**	4 days
Cost	**Low**	High
Process	**Simple** (Not require cell fixation)	Complicated (Require cell fixation)
Storage Condition	**Room Temperature**	< -20°C
Shelf Life	**Long (>2 years)**	Short

Annex 2A

expecting to launch the novel imaging reagent in the market by end of 2017. The endeavour will not only advance our scientific understanding of PC, but also provide a possible route to PC-based gene therapies and cancer treatment. At present, three personnel including two senior technologists and one technologist have joined Gary's team.

The lanthanide toolbox was awarded the gold medal in the medicine category at the 45th International Exhibition of Inventions of Geneva held in Switzerland from 29 March to 2 April 2017. Besides, it won the International Innovation Award of the Polish Academy of Science Institute of Genetics and Animal Breeding (Special Medal), as well as the Prize of the Malaysian Association of Research Scientists. In recognition of his research work, Gary was also awarded the President's Award for Outstanding Young Research at HKBU on 12 April 2017.

With his technology, Gary is now looking into the development of PC-specific carriers for drug delivery and other applications. Recently, he established a visualisation protocol that could enable direct 3D fluorescence imaging of PC in the near infrared region. Comprehensive *in vitro* studies and co-localisation experiments have confirmed that the specificity of the lanthanide toolbox is superior to that of conventional imaging reagents, such as GFP-ARL13B and IFT88. The marker is therefore an ideal diagnostic tool for studying the functions and roles of PC in the pathogenesis of cancer. The breakthrough technology is expected to have impact on the economy and human health.

Annex 2B

Development of lead ion testing paper with naked-eye observable readout for 10-minute on-site detection

Fast and simple

Lead (II) ions are dangerous contaminants. An excess of lead ions in the environment can have adverse effects on human health, such as retarded child development, permanent intellectual disability and chronic kidney damages. In recent years, reported cases of contaminated tap water with lead ions exceeding the permissible limit have increased substantially. The problem is particularly severe in housing estates and schools where children are likely to be affected. Therefore, an effective method for monitoring lead ions in the environment is greatly needed.

Dr Edmond MA Dik-Lung and his team from HKBU's Department of Chemistry have previously developed an on-site detection method that could measure lead ion concentrations in less than ten minutes. Using this as a basis, they have currently developed an equipment-free DNA-based testing paper that allows users to quantify lead-ion concentrations by naked eyes.

Over the past decades, much effort has been devoted to the topic of lead ion detection. However, conventional methods have had limited applications due to their poor mobility, stringent requirements and highly technical procedures. These problems have largely prevented the Hong Kong SAR Government and other regulatory authorities from rapidly and efficiently measuring

lead ion concentration at the site of contamination.

With the newly developed testing paper, the concentration of lead ions in drinking water can easily be measured without any assistance from a skilled or trained person. The device is compact and affordable even to developing countries, such as West Africa and India, where contaminated water is a common problem.

Patents

- *A luminescent iridium(III) complex and its uses thereof for the G-quadruplex-based switch-on rapid detection of lead ions* (US 15/291,041) was filed on 10 November 2016.
- *Development of lead ion testing paper with naked-eye observable readout for ten-minute on-site detection* (US 15/291,089) was filed on 12 October 2017.

Annex 2C

A Non-invasive Fast Diagnostic Method for Prostate Cancer Using Patients' Urine Samples

Glad tidings for men

In recent years, Hong Kong and China have seen a rising number of prostate cancer cases. As a result, high-risk patients are urged to seek medical advice on cancer prognosis. However, current screening methods such as Prostate Specific Antigen (PSA) blood test and digital rectal examination not only suffer from accuracy and reliability problems, but also are invasive and have side effects.

Dr Gary WONG Ka-leung and his team from HKBU's Department of Chemistry have now developed a non-invasive, accurate and fast diagnostic method for screening prostate cancer.

Recent research has found that citrate and polyamine levels are highly correlated with increased risk of prostate cancer. In theory, chemo sensors of citrates and polyamines can be used to detect prostate cancer, but current systems have several drawbacks, including broad emission bands, short luminescence lifetime and low signal-to-noise ratio.

Gary and his team have previously synthesised a luminescent lanthanide-based chemo sensor that specifically responds to polyamines in aqueous solution. Using this chemo sensor as a basis, they have now developed a highly sensitive, polyamine-specific lanthanide complex that could accurately determine the polyamine concentration of urine samples. They tried it on patients of different age groups and stages of prostate cancer and demonstrated that polyamine levels are trustworthy biomarkers for the early detection of prostate cancer. The discovery if implemented into clinical practice can reduce the mortality of prostate cancer with minimal risks and harms to patients. Two provisional patents have been filed in the US and a portable self-testing device is under development. Due to its potential applications, the Technology Start-ups Supporting Scheme for Universities (TSSSU) 2017–18 has awarded Gary and his team a grant to form New Life Medicine Company Limited.

Annex 2D

A Cordyceps Sinensis QC marker and Its Use in Quick Efficient and Low-cost Herb Authentication

Good herbs, bad herbs

The dried bodies of *Cordyceps sinensis*, otherwise known as Dongchong Xiacao, is a highly prized Chinese medicine. Its authentication remains a great challenge as many species with similar appearances are often mistaken as the real thing. Conventional authentication methods heavily depend on botanical experts' experience and subjective judgement. A more accurate method is DNA sequencing, but the technology is very expensive and time-consuming. Therefore, it is not suitable for use as a routine quality-control method. Moreover, the method does not indicate whether certain active ingredients are present in the sample.

Dr Simon HAN Quan-bin and his team from HKBU's School of Chinese Medicine have previously developed and patented a method for detecting polysaccharide markers. Using this as a basis, they have currently developed an innovative test that could speed up the authentication process of *Cordyceps sinensis*. The method involves measurement of polysaccharide markers, high-performance gel permeation chromatography and data analysis. This fast and simple technique has been filed a US non-provisional patent and received several enquiries from the industry requesting for consultancy service.

Annex 2E

An exemplar case of translational Chinese medicine

A jointly developed Chinese herbal concoction proves to be an effective treatment for irritable bowel syndrome

THE 2017 WINNER OF INNOVATIONEM AWARD

Professor BIAN Zhao-xiang and his team from HKBU's School of Chinese Medicine have developed a Chinese herbal medicine treatment that can effectively cure irritable bowel syndrome (IBS), a functional gastrointestinal disorder that is painful and difficult to cure. Developed in collaboration with the Chinese University of Hong Kong (CUHK), this is the first new Chinese medicine in Hong Kong that has been awarded a clinical trial certificate by the China Food and Drug Administration (CFDA). A license of the technology has been granted to a Chinese medicine granules manufacturer.

IBS is one of the most common gastrointestinal diseases in Hong Kong. There are reportedly about 3.1 million sufferers in the territory. It is estimated that about a third to a half of the population suffer from gastrointestinal symptoms due to high stress and work pressure — and as much as 90% of these symptoms are caused by IBS.

IBS patients tend to suffer intestinal dysfunctions, disorders and allergies. Even if patients receive normal results for their colorectal endoscopy, they can still have frequent abdominal pain, bloating, constipation, diarrhoea and other symptoms that affect their daily life. There is no radical cure for IBS, and current treatments such as traditional chemical medication, dietary adjustment and psychotherapy are only good for relieving symptoms. Lubiprostone, Alosetron, Rotundine, Belladonna Sulfamethoxazole and Trimerhoprim tablets are Western medications commonly used to treat IBS. However, these medicines are known to have strong side effects.

In 2002, Professor Bian established a collaboration with Professor Joseph SUNG and Professor Justin WU from the Faculty of Medicine at CUHK to investigate the feasibility of treating IBS using traditional Chinese medicine. Through funding support by the Innovation and Technology Commission, the two universities jointly developed a Chinese herbal medicine formula for the treatment of IBS.

The treatment composition is made from seven Chinese herbal medicines, including Terminaliae Chebulae, Radix Paeoniae Lactiflorae, Cortex Magnoliae Officinalis, Rhizoma Corydalis Yanhusuo, Herba Polygoni Chinensis, Rhizoma Atractylodis Macrocephalae and Semen coicis Lachryma-jobi. The extracts are formulated as powders or suspensions. The research group demonstrated that this composition is effective in curing visceral pain, torso pain and diarrhoea. The medicine can soothe the pain and discomfort caused by IBS. Through clinical studies, they showed that patient symptoms improved after taking the new Chinese herbal medicine for just eight consecutive weeks. Even when the patients stopped taking the medicine for two months, there was no recurrence of symptoms. It was unlike Western medicine treatment, which has a relatively high recurrence rate [1.1] [1.2]. The invention was awarded two patents in China and Hong Kong [1.3] [1.4].

Recognising the huge impact of the invention, several grants from external organisations were awarded to Professor Bian and his team from 2005 to 2010 [1.5] [1.6] in support of their research.

Both universities have exclusively licensed two patents to Hong Kong's largest concentrated Chinese medicine granules manufacturer, PuraPharm

Publications

1.1 Leung, W. K., Wu, J. C. Y, Bian, Z. X., Suen, B. Y., Ziea, E., Yim C. & Sung, J. J. Y. A pilot study comparing traditional Chinese herbal medicine or hyoscine on treatment of irritable bowel syndrome. *Journal of Gastroenterology and Hepatology* **22**, A143 (2007).

1.2 Bian, Z. X., Zhang, M., Han, Q. B., Xu, H. X. & Sung, J. J. Analgesic effects of JCM-16021 on neonatal maternal separation-induced visceral pain in rats. *World Journal of Gastroenterology* **16(7)**, 837–845 (2010).

Patents

1.3 預防和治療胃腸功能紊亂的中藥組合物、提取物及其應用 (CN Patent No. CN101176777B) was filed on 9 November 2006.

1.4 預防和治療胃腸功能紊亂的中藥組合物、提取物及其應用 (HK Patent No. HK1118014) was filed on 9 November 2006.

Grants

1.5 Chinese herbal medicine for irritable bowel syndrome: from basic mechanism to clinical cure (JCICM-16-02 revised). Hong Kong Jockey Club Institute of Chinese Medicine Ltd. ICM/16-02, HK$4,780,000 (2005–2007).

1.6 Towards drug development of JCICM-16-02 formula for irritable bowel syndrome. Hong Kong Jockey Club Institute of Chinese Medicine Ltd. ICM/4-7, HK$7,348,000 (2008–2010).

News

1.7 中大浸大研新藥 治腸易激綜合症, *Headline Daily*, 11 November 2016.

1.8 培力中醫藥科研產業見成果, *Sing Pao Daily News*, 15 November 2016.

Corporation Limited (PuraPharm). The company has been carrying out clinical trials in Mainland China since 2016. It is expected that this new medicine will be registered in Mainland China in the next four to five years, providing a new treatment option for IBS sufferers. Mr Abraham CHAN, the founder and chairman of PuraPharm, said:

"This partnership illustrates the first successful collaboration between the government, industry, academia and research sectors, promoting innovation and technological advancement in local Chinese medicine and developing Hong Kong into an international hub of Chinese medicine."

The partnership not only brings enormous benefits to the Chinese medicine industry, but also promotes the development of Chinese medicine in Hong Kong. A press conference cum collaboration signing ceremony for celebrating the receipt of clinical trial certificate from the CFDA was held in November 2016 in Hong Kong. The event received extensive local media coverage [1.7] [1.8], showing the extent of public interest in this new treatment.

The new Chinese medicine is also the first Hong Kong-developed compound mixture to be granted a clinical trial certificate by the CFDA. At present, only single compounds can be registered under the Chinese Medicine Division of the Department of Health, Hong Kong. However, Professor Bian made a breakthrough by convincing the Hong Kong SAR Government to conduct clinical trials in Hong Kong. HKBU, CUHK and PuraPharm have agreed to complete the clinical trials and register the herbal composition as a new medicine in Hong Kong and China. This case is unprecedented in that it changed the public's perception of Chinese medicine. In addition, it encouraged future government policies on the registration of new Chinese medicine. Furthermore, it is the first successful collaboration between the government, industry, academia and research sectors. It raises the standard of research and development in Hong Kong so that the city can emerge as a hub for Chinese medicine.

Annex 2F

Solving the mystery of autophagy

The compound MTOR-independent activator of TFEB can promote clearance of toxic protein aggregates

Parkinson's and Alzheimer's diseases are incurable neurodegenerative diseases. Professor LI Min and her team from HKBU's School of Chinese Medicine have discovered synthetic compounds that could inhibit Parkinson's and Alzheimer's disease by promoting clearance of toxic protein aggregates. Their discovery has resulted in two US patents, a licence agreement and a best poster award.

Neurodegenerative diseases are progressive and fatal human diseases. It is currently estimated that over 50 million people worldwide have dementia, Parkinson's disease or Alzheimer's disease, and over half of these people are from China. The alarming fact is that the number is set to double by 2030. Although many neuroprotective agents have been discovered and studied, no drug has been shown to cure Parkinson's or Alzheimer's disease in clinical trials at the moment.

Annex 2F

Recent studies have associated dysfunction in the autophagy–lysosome pathway (ALP) to neurodegenerative disorders (Pan *et al.*, 2008; Wong *et al.*, 2010). In addition, the transcription factor EB (TFEB) has been identified as a master regulator of ALP. In theory, small molecules that enhance TFEB expression or stimulate its nuclear translocation can promote the clearance of toxic protein aggregates, thus providing a disease-modifying intervention for neurodegenerative disorders (Decressac *et al.*, 2013; Parr *et al.*, 2012). Certain drugs, such as rapamycin and temsirolimus, can activate TFEB expression by promoting TFEB translocation (Roczniak–Ferguson *et al.*, 2012; Pena–Llopis *et al.*, 2011). However, their pharmacokinetic profile and side effects make them non-ideal for long-term use. Drugs that target TFEB instead hold great promise for the development of efficient neuroprotective therapies.

Autophagy is a process by which unwanted proteins and damaged organelles are transported to lysosomes for degradation. Professor Li and Dr Ju-xian SONG, Research Assistant Professor from the School of Chinese Medicine, have been actively engaged in identifying and developing novel autophagy regulators derived from Chinese medicine. Thanks to their academic background and research experience, they have identified several neuronal autophagy enhancers from herbal medicines [1.1–1.3]. These autophagy enhancers — a series of synthesised curcumin analogues — could directly bind and activate TFEB. This triggers the degradation of toxic protein aggregates, such as amyloid plaques, tau tangles and alpha-synuclein, and thereby protect neurons.

References

1. Pan, T., *et al.*, The role of autophagy-lysosome pathway in neurodegeneration associated with Parkinson's disease. *Brain* **131**(8),1969-78 (2008).
2. Wong, E. & A.M. Cuervo. Autophagy gone awry in neurodegenerative diseases. *Nature Neuroscience* **13**(7), 805-11 (2010).
3. Decressac, M., *et al.*, TFEB-mediated autophagy rescues midbrain dopamine neurons from alpha-synuclein toxicity. *Proceedings of the National Academy of Science of the United State* **110**(19), E1817-26 (2013).
4. Parr, C., *et al.*, Glycogen synthase kinase 3 inhibition promotes lysosomal biogenesis and autophagic degradation of the amyloid-beta precursor protein. *Molular and Cellular Biology* **32**(21), 4410-8 (2012).
5. Roczniak-Ferguson, A., *et al.*, The transcription factor TFEB links mTORC1 signaling to transcriptional control of lysosome homeostasis. Science Signal **5**(228), ra42 (2012).
6. Pena-Llopis, S., *et al.*, Regulation of TFEB and V-ATPases by mTORC1. *EMBO Journal* **30**(16), 3242-58 (2011).

The therapeutic market for Alzheimer's disease was worth US$8 billion in 2009 and $9.6 billion in 2014. For Parkinson's disease, the therapeutic market, which includes the US, Japan, Germany, the UK, France, Italy, Spain, Brazil, China, India and Russia, was estimated to worth US$3 billion. The market was primarily driven by two key parameters: increased prevalence in Parkinson's disease due to an aging population and increased cost of therapy. The global Parkinson's disease therapeutics market is expected to grow at a modest CAGR of 2.2% and reach US$3.65 billion by 2020. Therefore, the discovery of TFEB activators that can inhibit neurodegenerative diseases is expected to have huge economic benefits.

In 2015, Professor Li's invention titled *A Synthesised Curcumin Derivative Activates TFEB to Promote Autophagy and Lysosome Biogenesis and Protect Neurons Independent of MTOR Inhibition* won the best poster award at the Seventh International Symposium on Autophagy in China by outperforming 100 other posters. The award is an attest to Professor Li's efforts in autophagy, neurodegenerative diseases and drug discovery.

Professor Li's research has significantly raised the awareness of Chinese medicine and natural autophagy regulators that would further advance the development of new drugs and treatment for neurodegenerative diseases. Many researchers in the field of autophagy are interested in their compound since it directly targets TFEB without inhibiting the mammalian target of rapamycin pathway. The elimination of neurotoxic protein aggregates will not affect the normal functioning of cells. In addition, this small molecule is easily manufactured and can be taken orally.

A total of five patents — two in the US [1.3] and three in other jurisdictions [1.4–1.6] were granted and filed for this invention respectively. A license of the technology has been granted to a company in 2017. Furthermore, this research has received over HK$4.5 million of sponsorship and research grants for drug development.

Publications

1.1 Song, J. X., Li, M., *et al.* A synthesised curcumin derivative activates TFEB to promote autophagy and lysosome biogenesis and protect neurons independent of MTOR inhibition. Poster presentation at the 7th International Symposium on Autophagy (7th ISA), Huangshan, China, 19–23 March (2015).

1.2 Song, J. X., Li, M., *et al.* A novel TFEB activator promotes autophagy and lysosomal biogenesis in rat brain independent of MTOR inhibition. *Autophagy* **12(8)**, 1372–1389 (2016).

Patents

1.3 *A MTOR-independent activator of TFEB for autophagy enhancement and uses thereof* (US Patent No. 9351946B2 and US Patent No. 9540299B2) was filed on 6 and 16 March 2016.

1.4 *A MTOR-independent activator of TFEB for autophagy enhancement and uses thereof* (EP Patent Application No. 15759224.7) was filed on 6 March 2015.

1.5 *A MTOR-independent activator of TFEB for autophagy enhancement and uses thereof* (CN Patent: International Application No. PCT/CN2015/073764) was filed on 6 September 2016.

1.6 *A MTOR-independent activator of TFEB for autophagy enhancement and uses thereof* (HK Patent Application No. 16113937.1) was filed on 7 December 2016.

Annex 2G

Holistic innovation

HKBU forges new partnerships at the second conference of Emtech Hong Kong

The second edition of Emtech returned to Hong Kong on 6–7 June 2017 which was co-organised by Massachusetts Institute of Technology (MIT) Technology Review and Koelnmesse Pte Ltd. The conference showcased emerging technologies with the greatest potential to change our lives and provided an access point to the most innovative people and companies in the world. This year's theme was 'The Future of Technology' and key topics included New Materials, Innovation, Cloud, Big Data, Artificial Intelligence, Robotics, Automation, Virtual Reality, Augmented Life, Healthy Ageing, FinTech, Cybersecurity and Future Cities.

HKBU joined the second Emtech Hong Kong as Holistic Innovation Partner. In view of the large exposure provided by the conference, HKBU aimed to forge new partnerships and strengthen existing industry relationships.

Emtech Hong Kong was sponsored by five local universities this year. At the event, HKBU played the role of Holistic Innovation Partner. Meanwhile, PolyU was the Host Innovation Partner, HKU was the Premier Innovation Partner, and CUHK and CityU were both Strategic Innovation Partners. HKBU, PolyU, HKU and CityU set up exhibition booths at the venue to promote their innovation projects in the two-day events.

At HKBU's booth, three projects from three different departments including Physics, Biology and Chemistry were displayed. The titles of three projects were "Ultra-hard, Anti-scratch Thin Film" developed by Professor CHEAH Kok-wai, "Autologus Neural Stem Cell Harvest" developed by Professor Ken YUNG Kin-lam and "Lanthanide Toolbox" developed by Dr Gary WONG Ka-leung.

Thirty speakers coming from different categories of technology community attended the industry agnostic conference. The speakers delivered presentations in addition to engaging panel discussions and chats. Professor Cheah was invited as one of the speakers and joined the first session on the first day event, "New Materials: Bending the Rules of Physics". He talked about ArmoGlass™, an Ultra-Hard, Anti-Scratch Thin-Film Coating Technology and shared his experience about the prospect of commercialisation of the invention.

Besides, on 13 June 2017, an article titled *Hong Kong Biotech Start-up Claims*

▸ Annex 2G

World First in Stem Cell Treatment of Alzheimer's and Parkinson's diseases was published on the website of SCMP. (Source: https://goo.gl/ctu6fV)

PROFESSOR TESTIMONIALS

"The EmTech was a well-organised event; in particular its pre-conference allowed many investors, industrialists and start-ups to come together under a relax atmosphere. This allowed many exchanges in views and information. This allowed all of us to understand more during the conference when formal presentations were made. I do believe this is a great way to promote and encourage entrepreneurship."

— Professor CHEAH Kok-wai, Associate Head and Elizabeth Law Endowed Chair in Advanced Materials, Department of Physics

"I found EmTech conference very informative and well organised. I had met investors of venture capitals and they expressed great interests to pursue the talks on our techs during the pre-conference dinner. During the conference, the talks were very well-organised and they were excellent. During our exhibition, we attracted audience and media attention. I was invited to talk to a reporter of SCMP and she expressed great interests on our tech of HKBU."

— Professor Ken YUNG Kin-lam, Associate Head, Department of Biology

When East meets West

HKBU finds new biotech opportunities at BIO International Convention 2017

A delegation from HKBU comprising two KTO staff and two academic staff from the Department of Biology and the School of Chinese Medicine successfully exhibited 17 biotechnology inventions of HKBU in Hong Kong Pavilion at BIO International Convention 2017 (BIO 2017) from 19 to 22 June 2017 at San Diego, California, USA.

Through the world's largest biotechnology convention, some famous pharmaceutical companies and research centres such as Intelligent Pharma, JT Pharma, Cedars Sinar Medical Center, Mitsubishi Tanabe Pharma, GE Healthcare, AbbVie Incorporated and Sanofi visited HKBU booth and showed their interests in the University's inventions.

BIO 2017 attracted around 16,000 attendees and 5,000 organisers from 70 different countries. Nearly 40% were C-level executives at their respective companies. BIO 2017 allowed exhibitors like HKBU to showcase products and services in the areas of biopharmaceuticals, industrial biotechnology, life science trade, medical devices and diagnostics.

On 23 June 2017, HKBU delegates joined Biotechnology Mission and visited the Genomics Institute of Novartis Research Foundation. The Foundation helped bridge basic science with preclinical drug discovery for Novartis' global research organisation. HKBU delegates also visited the Scripps Research Institute, one of the top ten biotechnology research institutes in the US. They also had lunch with members of Sino–American Biotechnology and Pharmaceutical Professional Association (SABPA) at Singlera Genomics Inc. Finally, HKBU delegates visited Crown Bioscience Inc. and Johnson & Johnson Innovation — JLABs San Diego to learn about their premier translational platforms for cancer and metabolic diseases. Their goal was to help clients accelerate their drug development programs, as well as to facilitate incubatees to commercialise their products. Through these visits, HKBU delegates have opened up discussions that could potentially bring new collaborations or partnerships in the coming future.

Photo Caption ▸

① *The HKBU exhibition booth at BIO 2017, San Diego*

② *Collaborative meeting with GE Healthcare at BIO 2017*

③ *Interested visitors from Sanofi Pharmaceutical*

④ *HKBU delegates visiting the Scripps Research Institute*

Say a wish, save a life

Narrative animation helps improve youngsters' willingness to discuss organ donation with family

Say Your Wish, Save a Life is an evidence-based animated promotional video produced by Dr Timothy FUNG Kai-fung and Dr Kelvin LEE Kai-wah. The animation has created impact both in public health and public service. Dr Fung, Associate Professor from the School of Communication, has published extensively in the area of health communication. Through research, he identified the underlying psychosocial factors that influence human health behaviour. He also explored the links between uncertainty, affect and attitude towards health behaviour. Dr Lee, Senior Lecturer from the Academy of Film, is also an expert in computer animation. The animation encouraged citizens to tell their families their wish to donate organs. The project team included a specialist in nephrology and a former organ transplant coordinator. Their professional knowledge helped lead the direction of the animation.

The animation was showcased in the 26th International Congress of the Transplantation Society

In view of academic and practical merits, the Food and Health Bureau of Hong Kong adopted the film in its city-wide *Say Yes to Organ Donation* campaign. It debuted at the launching ceremony and was subsequently broadcast through various channels, including promotional channels of the Hospital Authority and social media pages of the Department of Health of Hong Kong. This territory-wide campaign was launched in 2016 to encourage more people to become organ donors. Apart from being screened at the kick-off ceremony of the promotional campaign attended by the Secretary for Food and Health of Hong Kong, the animation was also displayed on governmental websites. Moreover, the animation was broadcast on the government's Organ Donation Promotion Vehicle visiting 18 districts across Hong Kong. Organ donation has now become one of the government's health care and education foci. The adoption and continual use of Dr Fung's research in public service sector are clear indication of its impact.

The project animation was also showcased at the 26th International Congress of the Transplantation Society. The Congress attracted 2,800 scientific researchers, clinicians and other transplantation experts. Showcasing the animation at this medical congress signals the importance of Dr Fung's research in health communication.

Dr KO Wing-man, BBS, JP, Secretary for Food and Health (left) and Dr Timothy FUNG (right) at the kick-off ceremony of ***Say Yes to Organ Donation*** *promotion campaign*

The animation was well received by the Hong Kong Society of Transplantation (HKST), which sets to educate the public and medical professionals about transplantation science and organ donation. The animation was placed on the HKST website and shown to local high school students during the HKST education talks in 2016. Sponsored by the Hong Kong Broadband Network, the animation was showcased in over 80 McDonald's restaurants across Hong Kong. In recognition of its impact to the public, the project was awarded HKBU Knowledge Transfer Award 2017.

A video of the interview with the project team is available at: http://hkbutube.lib.hkbu.edu.hk/ov/display.php?id=10080 .

Selected references to the underpinning research of this project include:

1. Fung, T. K. F., Lee, K. K. W. & Lam M. F. A formative research as the groundwork for designing evidence-based adherence promotion campaigns for patients on peritoneal dialysis. *Journal of Communication in Healthcare* **9(2)**, 98–108 (2016).
2. Fung, T. K. F., Ng, Y. L., Lam, M. F. & Lee, K, K. W. Psychosocial factors predict nonadherence to PD treatment: A Hong Kong survey. *Peritoneal Dialysis International* doi:10.3747/pdi.2016.00094 (in press).
3. Fung, T. K. F., Ng, Isabella, Lam, M. F. & Lee, K. W. K. Deciding to discuss organ donation with parents: An in-depth interview study with Chinese young adults. *26th International Congress of the Transplantation Society* 18–23 (2016).
4. Fung, T. K. F., Griffin, R. & Dunwoody, S. Testing links among uncertainty, affect and attitude toward a health behavior in a risky setting. *Annual Conference of Association for Education in Journalism and Mass Communication* (2015).

Recipes for the soul

A community cookbook collaboration is key to holistic cancer care

Dr Angela MAK at the Hong Kong Book Fair 2016

「分甘同味」Sharing Plates Hong Kong is a visual collection of biographies presented together with easy-to-follow recipes. It tells the stories of 12 inspiring people comprising cancer patients, survivors and caregivers, and their secrets to making comfort food. The recipes were vetted by a Chinese medicine practitioner and a certified dietitian. The book explained the importance of integrating mind and body in cancer survivorship from both Chinese and Western perspectives. The project was led by Dr Angela MAK Ka-ying from HKBU's School of Communication and collaborated with Dr DANG Yi from HKBU's School of Chinese Medicine, top chef Ricky CHEUNG and the Hong Kong Cancer Fund (HKCF). It is the first inter-disciplinary Knowledge Transfer Partnership (KTP) project between the School of Communication and the School of Chinese Medicine.

Through research, Dr Mak and her team identified employer factors in hiring and retaining cancer survivors. Having reviewed the Singapore government's rehabilitation initiatives for cancer survivors, they pointed out that many books on cancer-fighting foods preached what and how patients should eat from an expert's point of view. In real life, however, patients are mentally and physically exhausted from medical treatments and side effects. They are deprived of the simple joy of eating and the willingness to live, which could impair their mental health and inner strength. Apart from HKCF, the Association of Hong Kong Hospital Christian Chaplaincy Ministry (AHKHCCM) and the Hong Kong Christian Cancer Care Association (HKCCCA) were also the external partners of this project. The participating cancer patients, survivors and caregivers were involved throughout the creative process and the writing of the cookbook. The in-depth interviews and engaging real-life stories offered us a peek into the lives of those who went through the traumatic journey. Apart from 12 heart-warming stories of cancer patients and caregivers, the book featured useful recipes verified by Dr Dang and a dietitian from HKCF. The audience can get nutritional tips while reading the cookbook and participating in interactive workshops.

Chef Ricky CHEUNG (left), Dr DANG Yi (right) and Dr Angela MAK (second from right) with participants at the book-sharing workshop

People can easily follow the recipes contributed by cancer patients, survivors and caregivers. The ingredients are all accessible from local supermarkets and fresh markets at affordable prices. The nutritional information verified by Dr Dang made the recipes reliable and authentic.

Book talk held at the Hong Kong Book Fair 2016

A book launch cum book talk was held in July 2016 at the Hong Kong Book Fair organised by the Hong Kong Trade Development Council. The book-sharing session held at Joint Publishing book store in October 2016 was well received. The interactive workshop and book-sharing session greatly increased the public awareness towards holistic cancer care. The project received extensive coverage in printed media, TV shows and radio interviews.

A video of the interview with Dr Dang is available at: http://hkbutube.lib.hkbu.edu.hk/ov/display.php?id=10071 .

Selected references to the underpinning research of this project include:

1. Mak, A. K. Y., Ho, S. S. & Kim, H. J. Factors related to employer's intent to hire, retain and accommodate cancer survivors: The Singapore perspective. *Journal of Occupational Rehabilitation* (2014).
2. Mak, A. K. Y., Chaidaroon, S., Fan, G. & Thalib, F. Unintended consequences: the social context of cancer survivors and work. *Journal of Cancer Survivorship* (2014).
3. Mak, A. K. Y. Toward an occupational rehabilitation policy community for cancer survivors in Singapore: A stakeholder perspective from the SME employers. *Journal of Occupational Rehabilitation* **21**, 77–85 (2011).

Empowering women at home

Cooperative organisers help women by tackling their work–family conflicts

Cooperative canteen in HKBU Shek Mun campus

Cooperative canteen in HKBU Shek Mun campus

Dr Sam YU Wai-kam from the Department of Social Work, Faculty of Social Sciences has established a new cooperative canteen in HKBU Shek Mun campus in partnership with Hong Kong Women Workers' Association (HKWWA).

The cooperative canteen is an important vehicle for helping women participate actively in both the workforce and their family. It provides a friendly working environment for women to achieve their work–life balance. The cooperative canteen not only provides jobs but also gradually enables the sharing of ownership. It is hoped that women can achieve economic independence through setting up such cooperatives.

Participants at a training workshop

Dr Yu has a strong academic background in welfare ideologies and comparative social policy. He and his team examined the link between the effects of pro-market pension reforms on women and familisation measures. Another study conducted by Dr Yu and his team used two methodologies to develop defamilisation typologies across 25 countries. Dr Yu and his team also conducted a study on how the Hong Kong Government used a double-attachment strategy to develop welfare-to-work measures for single parents. Through the implementation of the project, the general public learned how cooperatives help women manage their work and family. The general public also learned about the concepts of familisation and defamilisation.

Selected references to the underpinning research of this project include:

1. Chau, R. C. M., Yu, S. W. K., Foster, L. & Lau, M. K. W. Defamilisation measures and women's labour force participation — a comparative study of twelve countries. *Journal of International and Comparative Social Policy* **33(1)**, 73–86 (2017).

Social Economy and Cooperative Organisers Policy Conference, July 2016

2. Yu, S. W. K., Chau, R. C. M. & Lee, K. M. Using defamilisation typologies to study the Confucian welfare regime. *Journal of International and Comparative Social Policy* doi:10.1080/21699763.2014.992457 (2015).

3. Yu, S. W. K., Chau, R. C. M., Boxall, K. & Chung, W. C. Y. Looking to the east and the west: the double-attachment strategy used by the Hong Kong government to develop welfare to work measures for lone parents. *Journal of International and Comparative Social Policy* doi:10.1080/21699763.2013.861357 (2014).

4. Chau, R. C. M. & Yu, S. W. K. Defamilisation of twenty-two countries: its implications for the study of East Asian welfare regime. *Social Policy and Society* **12**, 355–367 (2013).

Healthy lifestyle for the elderly

Promoting light volleyball to Hong Kong senior citizens

Participant at a light volleyball class

Professor CHUNG Pak-kwong and Dr Carman LEUNG Ka-man, both from the Department of Physical Education, Faculty of Social Sciences, introduced a relatively new sport called light volleyball (LVB) to the elderly of Hong Kong. They did this in partnership with Hong Kong Light Volleyball Association and Caritas Youth and Community Service. They found that the physical and psychosocial health of elderly people improved after LVB classes and intervention. Moreover, they showed that LVB strengthened the upper and lower limb muscles of senior citizens, as well as enhanced their strength, agility, balance and aerobic endurance. Most importantly, LVB reignited their interest in physical activities.

Professor Chung and Dr Leung have previously conducted research in functional fitness, health of older adults and indicators of general health. They collected normative data from older adults in Hong Kong and identified differences in functional fitness that indicate a high risk of falling.

Light volleyball classes

LVB is a great exercise and it is particularly useful for strengthening muscles to prevent falls. The level of fitness required and the pace of the sport make it suitable for older adults. The functional fitness of older adults degenerates with age. Appropriate exercise intervention can slow their rate of degeneration. Not only does exercise ensure older adults have better self-care abilities and psychological health, it can also help governments and families save on healthcare expenses.

A territory-wide physical fitness test conducted by the Sports Commission of the Hong Kong Government revealed the lack of physical activities among middle-aged and older adults. In response, LVB was promoted as a solution to insufficient physical activities. The team organised LVB classes and intervention for middle-aged and older adults in Hong Kong. The concept of 'train the trainer' (i.e., LVB professionals) was used to spread the knowledge and skills of LVB to practitioners. The team published a teaching kit called *Steps of Playing Light Volleyball* to facilitate the promotion of this concept.

The research team invited 90 participants aged over 60 to take part in a 15-week study. The participants were then divided into three groups: LVB, rouliqiu training and control. Results from the study showed that both light volleyball and rouliqiu can improve older adults' lower limb muscle strength and endurance, agility/balance and increase their enjoyment of physical activity. Older adults who played light volleyball showed better aerobic endurance and also displayed greater upper limb muscle strength compared to the other two groups.

A light volleyball seminar

This project gained extensive coverage in printed media and television programmes. It was broadcast on *Sports World*, a TV programme by the Television Broadcasts Limited (TVB). A press conference was held to highlight the success of promoting LVB to middle-aged and older adults in Hong Kong. The project was also warmly received at the Golden Age Expo and Summit (GAES) 2017 held at the Hong Kong Convention and Exhibition Centre.

Selected references to the underpinning research of this project include:

1. Chung, P. K., Zhao, Y. N., Liu, J. D. & Quach, B., Functional fitness norms for community-dwelling older adults in Hong Kong. *Archives of Gerontology and Geriatrics* **65**, 54–62 (2016).
2. Zhao, Y. N. & Chung, P. K. Differences of functional fitness between older adults with and without risk of falls. *Asian Nursing Research* **10(1)**, 51–55 (2016).
3. Chung, P. K., Mui, R., Zhao, Y. N. & Liu, J. D. Training effects of water Tai Chi on health indicators among Chinese older females in Hong Kong. *International Journal of Physical Education, Sports and Health* **1(2)**, 20–24 (2014).
4. Leung, K. M. & Chung, P. K. Government should have walking programmes for older adults. *Bauhinia Tribune* **21**, 94–100 (2015).

UGC Required Performance Indicators

Performance Indicators	2014-15	2015-16	2016-17	2017-18 (Projection)
Number of patents filed in the year (with breakdown by country and type)	Country	Country	Country	Country*
	28 (US)	37 (US)[N1]	47 (US)	55 (US)
	7 (CN)	14 (CN)[N1]	6 (CN)	10 (CN)
	6 (PCT)	3 (PCT)	9 (PCT)	10 (PCT)
	4 (HK)[N1]	6 (HK)	8 (HK)	5 (HK)
	3 (EP)	1 (EP)	4 (EP)	2 (EP)
	1 (CA)	2 (TW)	6 (TW)	6 (TW)
	1 (JP)[N1]		2 (JP)	2 (JP)
	1 (IN)[N1]		1 (KR)	
	Type	Type	Type	Type*
	2 (A47)	1 (A47)	8 (A47)	10 (A47)
	28 (A61)	39 (A61)[N1]	31 (A61)	35 (A61)
	1 (A63)	1 (A63)	1 (A63)	1 (A63)
	1 (B82)	3 (C02)	1 (B01)	1 (B01)
	4 (C02)[N1]	1 (C05)	1 (B82)	1 (B82)
	2 (C07)	3 (C07)	1 (C02)	7 (C02)
	3 (G01)	1 (C12)	10 (C07)	10 (C07)
	7 (G06)	3 (G01)	1 (C09)	5 (G01)
	3 (H01)	5 (G06)	2 (C12)	5 (G06)
		6 (H01)	7 (G01)	15 (H01)
			4 (G06)	
			16 (H01)	
Number of patents granted in the year (with breakdown by country and type)	Country	Country	Country	Country*
	5 (US)	15 (US)[N1]	17 (US)	17 (US)
	8 (CN)[N1]	22 (CN)[N1]	10 (CN)	6 (CN)
		3 (EP)[N1]	1 (HK)	1 (HK)
		1 (TW)	1 (TW)	1 (TW)
	Type	Type	Type	Type*
	10 (A61)	36 (A61)[N1]	24 (A61)	14 (A61)
	1 (A23)	1 (B82)	2 (B82)	3 (B82)
	1 (C07)	1 (C02)	1 (G01)	1 (C02)
	1 (G06)	3 (G06)[N1]	1 (G06)	2 (C07)
			1 (H01)	1 (G01)
				2 (G06)
				2 (H01)
Number of licenses granted (with breakdown by type)	14 (Royalty)	16 (Royalty)	38 (Royalty)	42 (Royalty)
Income (on cash basis) generated from intellectual property rights	HK$6,831,150	HK$5,609,403	HK$8,818,504 [N2]	HK$9,700,354
Expenditure involved in generating income from intellectual property rights	HK$3,871,950	HK$2,645,239	HK$5,827,043	HK$6,409,747
Number of economically active spin-off companies	3 [N3 & N4]	3 [N3 & N4]	3 [N3 & N4]	3 [N3 & N4]
Net income generated (or net loss arising) from spin-off companies	(HK$836,000) [N5]	HK$359,400 [N6]	HK$245,600	HK$270,160
Number of collaborative researches, and income thereby generated	16 HK$10,316,741	17 HK$21,091,809 [N7]	26 [N8] HK$14,575,453 [N9]	29 HK$16,032,998
Number of contract researches (other than those included in "collaborative researches" above), and income thereby generated	61 HK$23,851,333	66 HK$23,975,291	77 [N10] HK$42,548,507 [N10]	85 HK$46,803,358
Number of consultancies, and income thereby generated	234 HK$19,676,326	224 HK$22,264,857	194 [N11] HK$18,891,329 [N11]	213 HK$20,780,462
Number of student contact hours in short courses or e-learning programmes specially tailored to meet business or Continuing Professional Development (CPD) needs	53,153	61,126	69,611 [N12]	76,572
Number of equipment and facilities service agreements, and income thereby generated	230 [N13] HK$6,761,607	233 [N13] HK$7,589,008	209 [N13] HK$6,672,609 [N14]	230 HK$7,339,870

Performance Indicators	2014-15	2015-16	2016-17	2017-18 (Projection)
Income received from CPD courses	HK$3,460,893	HK$3,133,580	HK$2,698,865 N15	HK$2,968,752
Number of public lectures / symposiums / exhibitions and speeches to a community audience	512	565	583	641
Number of performances and exhibitions of creative works by staff or students	132	82	87 N16	96
Number of staff engaged as members of external advisory bodies including professional, industry, government, statutory or non-statutory bodies	156	124	108 N17	119

N1: The data of 2014-15 and 2015-16 were amended due to late reporting of joint patent applications between HKBU and other institutions (lead parties).
N2: The increase was due to an increase in number of license deals.
N3: Company with some institutional ownership and using intellectual property from the institution.
N4: Breakdown of the spin-off companies.
Institute for the Advancement of Chinese Medicine Ltd.
- *Year of establishment: 1999.*
- *Size of employment: 3 (the General Manager, the Assistant Marketing Manager and the Product Development Officer), with other supporting staff contracted from HKBU.*
- *Nature of business: R&D of Chinese medicine products, testing and certification services, clinical trials, and publication of books.*

HKBU Science Consultancy Company Ltd.
- *Year of establishment: 2011.*
- *Size of employment: All contracted out to HKBU for the experts and professionals required.*
- *Nature of business: Provision of consultancy projects on science disciplines.*

HKBU R&D Licensing Ltd.
- *Year of establishment: 2014.*
- *Size of employment: 1 (administrated by KTO).*
- *Nature of business: Intellectual properties commercialisation and trading.*

N5: A net loss was recorded due to additional cost for moving into Hong Kong Science & Technology Parks Corporation and a closure of laboratory.
N6: The income was amended after being audited by the professional.
N7: The significant increase in income was due to an increase in the average of funding received per collaborative project such as Innovative and Technology Fund Collaborative Project.
N8: The increase was due to more new projects being launched.
N9: Some new projects were conducted more than one year and only partial of the income were recorded in this year.
N10: There were more contract researches conducted by staff from School of Chinese Medicine. Hence, the income generated increased.
N11: Number of consultancies decreased due to a decrease in number of activities being undertaken by some key staff. Hence, the income generated decreased.
N12: A project from Academy of Visual Art (AVA) was newly reported this year, so the number of student contact hours was increased.
N13: This number included data from Jockey Club Creative Arts Centre (JCCAC) and the Academic Commuity Hall .
N14: The decrease of income was due to more internal activities/ events being conducted by HKBU's departments.
N15: Although there was an increase in the number of student contact hours, the income received decreased. This was because a sponsorship was received for the AVA's project.
N16: The increase was due to more poetry reading being conducted by Faculty of Art.
N17: The decrease was due to decrease in number of staff (i.e. Faculty of Science, Social Science and School of Business) engaged in external advisory bodies.
* The projections in number of patents filed/granted in the year (with breakdown by country and type) are based on solely owned patents of HKBU or HKBU as a lead party in joint patents.

HKBU Specific Performance Indicators

Performance Indicators	2014-15	2015-16	2016-17
Number of placements / internships, and average length	1,628 (places) 1.97 (months)	2,400 (places) 1.63 (months)	2,268 (places) M1 1.7 (months)
Books and other media for non-academic audiences	1,109	1,041	1,158 M2
Number of mentors by University and non-University staff	313	367	380
Number of videos produced by HKBU available for open access	1,471 M3	1,694 M3	1,836 M3
Download count of postgraduate theses to addresses outside HKBU	30,579 M4	11,227 M4	10,380 M4
View count of BUTube outside HKBU	159,971	129,187	68,034 M5
Number of positive media impact related to knowledge transfer coverage, including print, on-line and electronic media	1,359	1,551	1,202 M6
Number of staff available for media contact	329	344	342
Number of appointments of external members to HKBU advisory boards, committees or panels	261	274	291
Number of other activities related to Knowledge Application outside HKBU	46	104	73 M7

M1: The decrease in number of placements/ internships was due to decrease of enrollment in a double degree programme.
M2: The increase was due to more articles being published by School of Communication.
M3: This was an accumulated number.
M4: This number included the pageview of abstracts and actual downloads.
M5: The decrease in view count was due to fewer new videos were uploaded from departments.
M6: The decrease in number of positive media impact was due to an increase of cultural programmes organised by other organisations in Hong Kong.
M7: More school talks/ courses were conducted last year due to HKBU's 60th anniversary.

香港浸會大學 HONG KONG BAPTIST UNIVERSITY

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