Research Assessment Exercise 2020

Impact Overview Statement

University: The Chinese University of Hong Kong
Unit of Assessment (UoA): 01 Biological Sciences
Total number of eligible staff of the Faculty in the UoA: 30

(1) Context – context for the individual case study (ies)

School of Life Sciences (SLS) has a broad range of world-leading research activities organized into 8 areas (Cell biology, Food & nutritional science, Environmental science, Genomics & bioinformatics, Marine science, Plant & agricultural science, Physiology & developmental biology, Protein science). The UoA engages with diverse non-academic beneficiaries, ranging from industries to the public and secondary school students, to deliver impacts and benefits including **Economy and commerce:** 3 spin-out companies established and 12 patents generated from SLS's researches across the RAE period; industrial collaboration with local and international recognized health care, pharmaceutical, food companies (e.g. AstraZeneca UK, Wyeth, Coca-Cola China, etc.) to address industrial challenges through developing new methods and technologies; **Human health and welfare:** Novel findings on disease mechanisms, new therapeutic compounds and subtype of rare genetic diseases have provided the ground for the drug development. **Policy and International development:** Being appointed to be members or chairperson of various HKSAR government advisory committees to influence policymaking. **Public Engagement:** Diverse range of outreach activities, public lectures, media coverage, exhibitions, etc. to arouse public awareness of the implementation of excellent research works from the UoA into everyday life.

(2) Approach to impact – the unit's approach to impact during the assessment period for impact

Translational impact is built on the solid foundation of excellent scientific researches. The pursuit and delivery of non-academic impacts are recognised as the mission of the UoA by following approaches.

a) Excellent Researches. Inter-disciplinary collaborative researches are established in this UoA with a long history, e.g. plant and agricultural sciences and their biotechnological applications, etc., being supported by high-specification laboratories / centres, including UGC-Areas of Excellence Centers, State Key Laboratories, etc.

b) Strong support for knowledge transfer and industrial collaboration. The Office of Research and Knowledge Transfer Services **(ORKTS)** at University level provides service to forge and maintain industry links, support knowledge transfer and establish University's IP licensing. In this RAE census period, **12 granted patents** were generated from this UoA and **3 spin-out companies** (Codex Genetics Limited, HSK GeneTech Limited, Mushroom-X Limited) were founded by faculty members and alumni associated with the UoA. The UoA has a continuous mission to nurture young scientists for excelling the innovative researches and applying to society. 6 undergraduates in this UoA have enrolled in the **CUHK Entrepreneurship and Innovation (EPIN) programme** since the programme was founded in 2017. With generous private/industrial funded grants of **over HKD43M** in this census period, research findings from the UoA favor the development in **pharmaceutical, food, health care, environmental** industries with the latest technologies. To strengthen the connection between UoA and industries, UoA members transfer their expertise by **delivering continued professional consultation or commissioned services** to various industries, e.g. Lee Kum Kee, Vitasoy, Wyeth, Zigen, Coca-Cola China, AstraZeneca UK, etc. The strong collaboration between industries and the UoA can be demonstrated by the industry supported student internship, e.g. New β Innovation Ltd., GeneHarbor (HK) Biotechnologies Ltd., Xcelom Limited and Sanomics Limited, PHASE Scientific, Widex Technology, etc. These strategic interactions earn the UoA positive reputation and incidentally foster future partnerships.

c) Influencing policymaking. The UoA values the essentiality of bringing impact to the society as well. UoA members are serving the community with their expertise and implementation of their research findings into practices and policy changes by **working with local or national government,**

such as Endangered Species Advisory Committee; Genetically Modified Organisms (Control of Release) Ordinance expert group; Agriculture, Fisheries and Conservation Department; Government Chinese Medicines Testing Institute; Gansu Seed Administrative Bureau, etc.

d) <u>Enhancing public engagement.</u> The UoA has a long track record of emphasizing arousing public awareness of the impact of their cutting-edge researches through public talks, STEM education programmes, media coverage and exhibitions. The UoA has hosted or co-organised with the Faculty for **Yen Kwo Yung Lecture in Life Sciences** (since 2015) and an annual **Lau Oi Wah Memorial Science Lecture Series** (since 2005), respectively, to explore forefront life sciences topics for the future scientists. Numerous of STEM education programmes have been launched to target secondary school students since 2016, including **Coral Academy**, **STEAM@soybean**, **Botany STEAM Education Project** by Shiu-Ying Hu Herbarium. The UoA has collaborated with Amgen Inc. to set up "**Hong Kong Amgen Biotech Experience**", with the vision to bring the robust biotechnology training to students and professional development for teachers. The UoA has co-organized the **HK SciFest**, with Hong Kong Science Museum since 2015. UoA members also participated in various exhibitions since 2011 including **InnoCarnival, China Hi-Tech Fair, Eco Expo Asia**, to showcase their state-of-the-art researches for the general public. It is worthwhile to mention that Prof. Edwin Chan, who is working on Spinocerebellar Ataxia (SCA), has initiated the SCA patient registry project in Hong Kong to improve the quality of life for those affected by rare diseases.

e) <u>Motivating staff to engage in impact development.</u> The UoA encourages members to seek professional consultation services from ORKTS for knowledge transfer by industrial collaboration and commercialization. UoA also recognizes the efforts paid by UoA members in translating their researches into impact. In addition to providing administrative support and granting leaves to staff engaging in outreach activities, 3 UoA members have been awarded the **UoA impact development seed fund** to further augment their research project potential impacts. Moreover, research impacts on policy, practice, quality of life, and quality of teaching and learning are assessed in the annual staff appraisal (Academic Staff Development Review). Furthermore, the UoA also supports members participating in the **Project impact enhancement fund (PIEF)** and **Impact Postdoctoral Fellowship Scheme (IPDFS)** at university level for impactful research activities. Several UoA research projects with impact potential have been supported with IPDFS.

(3) Strategy and plans – strategy and plans for supporting impact

The UoA further exploits the non-academic impacts by the collaboration with ORKTS and envisages the associated impacts from the on-going or future research projects by continuous seed funding allocation as an incentive for UoA members. Apart from applying existing funding opportunities, such as ITF to establish industrial collaborations, UoA members are encouraged to apply for new UGC **Research Impact Fund** to conduct impactful and translational research. Prof. Liwen Jiang has awarded HKD5M for 2018/19 to initial a joint research project with a Wuhan-based pharmaceutical company. The UoA has also supported the hiring of an impact officer in the Faculty of Science to facilitate the translation of researches into impact.

(4) Relationship to case studies – the relationship between the unit's approach to impact and the submitted case studies

The two submitted impact cases illustrate the extensive range of the UoA research and the staff agility in alignment with the UoA five approaches to impact. Both cases exemplify the **excellent researches** in plant and agricultural sciences and their biotechnological applications. Shaw's impact case has a direct bearing on the UoA's approach to impact through patents granting, **collaboration with companies and regulatory authorities** to adopt his novel methodologies in quality control of herbal medicine. Lam's impact case demonstrates his novel stress tolerant soybean exerting enormous social impact on underprivileged farmers in Gansu through **collaboration with a food company and national agricultural government bodies**. Both cases exploit the impact with **public engagement** by public talks, exhibitions and media coverage. Meanwhile, these cases exemplified the approach of **motivating staff for impact development** with the support of UoA impact development seed fund.