

Research Assessment Exercise 2020
Impact Overview Statement

University: |The Chinese University of Hong Kong |

Unit of Assessment (UoA): 2 |

Total number of eligible staff of the university in the UoA: 40 |

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

The School of Biomedical Sciences conducts cutting-edge multi-disciplinary research that leads to impact across clinical medicine, pharmaceutical industry, food and drug safety, and public science education. The impacts are in three major areas with cases having impact in more than one area:

- **Delivering benefit to the patients and industry** - The School is actively pursuing the commercialization of research outputs based on the development of antiemetics for cancer patients undergoing chemotherapy through partnering with major pharmaceutical companies. The development of a stem cell reprogramming kit allows the creation of new IP, and the formation of new company that have revenue generating capacity.
- **Influencing public bodies** - The School sustains strong and successful preclinical R&D efforts in developing effective drugs for cancer patients and are being recognized and commended by major multinational medical organizations. Through collaboration with governmental organizations, such as the United States Centers for Disease Control and Prevention, incidence of food safety of public health proportion was investigated using the state-of-the-art technology developed by our investigators. Food safety standards developed are being adopted by international and local regulatory agencies and the food industry.
- **Engaging the public** - Our impact case on STAP stem cells highlights the use of online social media in disseminating important scientific controversies to a broad audience including research scientists and the lay public. Public engagement using internet-based platforms highlights the educational missions of the School in making the public aware of the latest in cutting edge scientific research and the issues of scientific misconduct. The School demonstrates the effective use of social networking tools to overcome the huddles posed when attempting to publish in major scientific journals.

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

Our approaches to achieving impact are driven by the cumulation of three key strategic visions:

- **Fostering multidisciplinary research** - To achieve greater cross-disciplinary integration, the School has undergone restructuring in 2016 by consolidating five thematic research programs into three. The School retains approximately 40 principal investigators engaging in a broad range of biomedical research and are supported by more than HK\$85 million investment in state-of-the-art core facilities. Platforms to foster international collaborations are evidenced by the establishment of Joint laboratories with the Chinese Academy of Science, Jinan University, Shandong University, University of Southampton and Utrecht University. Clinical colleagues from the Prince of Wales Hospital are invited to serve as Associate Members of the School and to participate in Annual Research Day. The Research Committee of the School has oversight responsibility to monitor the progress in identifying and promoting research impact.
- **Emphasis on translational research with broad reach** - Clinical areas with substantial unmet needs are prioritized for nurturing impact cases. Principal investigators from the School work extensively with clinical colleagues in identifying impactful research that can benefit a large population of patient. Besides, substantial investment by the University and the School in upgrading the infrastructure of the core animal facility allows high quality results to be generated for translational studies. Pre-clinical animal models with proven translational value are being used in drug discoveries. Impact building is also prioritized in areas that the School has a unique strength. The research in Traditional Chinese Medicine (TCM) and the use of herbal supplements in treating a variety of ailments have a deep-rooted history in the unit. The

consumptions of TCM are highly prevalence globally. Safety issues related to liver damaging contaminants in herbal medicine and natural food products are posing major health risks. There is a considerable unmet need for standardized monitoring of these contaminants globally.

- **Promote knowledge transfer and commercialization of research outputs** - The School works closely with the Office of Research and Knowledge Transfer Services (ORKTS) in identifying industrial partners, advising on contractual and licensing issues of intellectual property rights. Two major Mainland pharmaceutical companies listed in Hong Kong stock market have established formal links with the School. Investigators are also encouraged to apply for two major sources of funding from the Food & Health Bureau and Innovation & Technology Commission, to support projects with clear commercialization potential. During the assessment period, a total of 5 spin-off companies are being established by School members in areas of genome editing and stem cell research. |

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

|At the School level, a task force on Planned Strategic Research Development covering the 5-year period between 2015-2020 has drawn up a roadmap to guide the School in aspects related to research and educational mission. Furthermore, a site visit was conducted by a five-member external Visiting Committee chaired by Dr. Vassilios Papadopoulos, Dean, School of Pharmacy, University of Southern California in 2018 to steer the School in future development and to advice on plans to achieve impact. In addition, two faculty members have been assigned the role as a convener for impact with the duty to coordinate events related to identifying and assessing impact cases. Colleagues are also encouraged to apply for funding to enhance their research impact including special University-based postdoctoral fellowships for generating impact. Additional financial resources under the funding mechanisms of Research Impact Fund (RIP), and Collaborative Research Fund (CRF), are being administrated by the Research Grants Council (RGC) that focus on driving high impact research through interdisciplinary collaborations and industrial partnerships. At the University level, the ORKTS under the Office of the Pro-Vice-Chancellor for Research coordinates events to enhance staff awareness and participation in impact-building activities. Informational sessions, workshops for writing impact cases, and experience sharing sessions from external experts have been held during the assessment period. The School works with ORKTS to foster dialogues with major pharmaceutical companies, such as Pfizer, Wuxi Biologics, and HEC Pharm Co Ltd, with the goal of enhancing the chance of commercializing and licensing of research outputs. |

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

|The impact case on drug development for chemotherapy-induced nausea and emesis highlights the sustained partnerships with more than 10 international pharmaceutical industries over a period of more than two decades. This impact also demonstrates the unit's approach to focus on research that has broad reach as the number of cancer patients being benefited from this impact is substantial. It also reflects substantial investment in infrastructure by establishing a state-of-the-art animal facility for generating high quality pre-clinical data used in drug discovery. The impact case related to standardization of liver damaging contaminants in food and herbal medicine explores the unique strength of the unit in TCM. The adoption of standardized monitoring protocols for pyrrolizidine described in this impact case demonstrates the close partnership with local food companies as well as international regulatory agencies. The impact case related to STAP Stem cell controversy highlights the efforts by the unit in public engagement through internet-based social media network. The translation of research findings into a marketable product for stem cell research and the establishment of a start-up company reflects the entrepreneurial environment fostered by the unit in close partnership with ORKTS. |