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職稱：助理教授

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### 研究領域

主要研究領域為天然新藥研發，曾從事抗糖尿、抗炎、抗癌、化合物結構及其標靶蛋白相互關係等分子藥理研究。研究內容包括生物分子機理、化學分子結構與其活性關係、細胞內質壓力所引致的凋亡及自體吞噬作用，及  $\text{Ca}^{2+}$  與 AMPK-mTOR 傳遞訊號通路等。近期，專注於研究細胞自體吞噬作用與腦神經退化性疾病的關連。主要的研究內容包括，利用創新中藥活性化合物引發細胞自體吞噬，以加強錯誤摺疊蛋白質降解，為開發治療抗神經退化疾病提供新方向。曾於各知名 SCI 期刊包括 *International Journal of Molecular Sciences (IJMS)*, *Evidence-Based Complementary and Alternative Medicine (ECAM)*, *Cell Death & Diseases*, *Molecular Cancer Therapeutics*, *Molecules*, *Scientific Reports*, *Oncotarget* 及 *Autophagy* 等發表學術文章。

### 學歷

2009. 10 香港大學哲學博士學位

2003. 12 香港科技大學環境科學碩士學位

2001. 6 香港科技大學生物學學士學位

### 教學經驗

2011. 9 - 今 ，澳門科技大學助理教授  
2011 年 3 月 - 2011 年 8 月 ，香港浸會大學博士後研究員  
2010 年 5 月 - 2011 年 2 月 ，香港大學研究員並兼任香港中文大學榮譽研究員  
2009 年 11 月 - 2010 年 4 月 ，香港大學高級研究助理

### 獲獎

- ◇ Eli Lilly Asia Outstanding Graduate Thesis Award 2010 禮來亞洲傑出論文獎
- ◇ Bank of China (BOC, Macau Branch) Excellent Research Award 2015  
中銀(澳門)學術研究優秀獎

### 發表之國際學術論文

1. Frederic K.C. Fung, **Betty Yuen Kwan Law**, Amy C.Y. Lo. Lutein not only attenuates apoptosis but also alleviates autophagosome formation upon cobalt (II) chloride-induced hypoxia in rat Müller cells. *PLOS ONE* DOI:10.1371/journal.pone.0167828 December 9, 2016. (IF: 3.057; Q1)
2. Chenfangyuan DUAN, Kam Wai WONG, **Betty Yuen Kwan Law\***. Analysis of the Medication Safety Knowledge among College Students in Macau. *Journal of Macau University of Science and Technology* Vol.10 No. 2, Dec 30, 2016.
3. An-Guo Wu, Wu Zeng, Vincent Kam-Wai Wong, Yi-Zhun Zhu, Amy C.Y. Lo, Liang Liu & **Betty Yuen-Kwan Law\***. Hederagenin and  $\alpha$ -hederin promote degradation of proteins in neurodegenerative disease and improve motor deficits in MPTP-mice. *Pharmacological research* 115 (2017) 25-44. 9 Nov 2016. (IF: 4.816; Q1)
4. Simon Wing Fai Mok, Vincent Kam-Wai Wong, **Betty Yuen Kwan Law\***. Comment: New Potential Pharmacological Functions of Chinese Herbal Medicines via Regulation of Autophagy: The Search of Reliable Pharmaceutical Candidates for Chronic Disorders Therapy. *Journal of Neurology and Neuromedicine* (2016) 1(7): 6-9.
5. Vincent Kam-Wai Wong#, **Betty Yuen-Kwan Law#**, Xiao-Jun Yao, Xi Chen, Su Wei Xu, Liang Liu\* and Elaine Lai-Han Leung\*. Advanced research technology for discovery of new effective compounds from Chinese herbal medicine and their molecular targets. *Pharmacological research*. 2016 Sept. Volume 111, Pages 546–555. #Authors with equal contribution. (IF: 4.816; Q1)

6. Su-Wei Xu, [Betty Yuen Kwan Law](#), Simon Wing Fai Mok, Elaine Lai Han Leung, Xing Xing Fan, Paolo Saul Coghi, Wu Zeng, Chung-Hang Leung, Dik-Lung Ma, Liang Liu, Vincent Kam Wai Wong. Autophagic Degradation of Epidermal Growth Factor Receptor in Gefitinib-resistant Lung Cancer by Celastrol. *International Journal of Oncology*. 2016; June. DOI: 10.3892/ijo.2016.3644. (IF: 3.257; Q2)
7. Ean-Jeong Seo, Mohamed Saeed, [Betty Yuen Kwan Law](#), An Guo Wu, Onat Kadioglu, Henry Johannes Greten, Thomas Efferth. Pharmacogenomics of Scopoletin in Tumor Cells. *Molecules*. 2016; 21(4), 496. (IF: 2.465; Q2)
8. [Betty Yuen Kwan Law](#)<sup>#</sup>, Simon Wing Fai Mok, An Guo Wu, Christopher Wai Kei Lam, Margaret Sum Yee Yu and Vincent Kam Wai Wong\*. New Potential Pharmacological Functions of Chinese Herbal Medicines via Regulation of Autophagy. *Molecules*. 2016, 21, 359. (IF: 2.465; Q2)
9. Klionsky DJ, Abdelmohsen K, Abe A, Abedin MJ, Abeliovich H, Acevedo Arozena A, ....., [Betty Yuen Kwan Law, et al.](#) Guidelines for the use and interpretation of assays for monitoring autophagy (3rd edition). *Autophagy*. 2016 Jan 2;12(1):1-222. (IF: 9.108; Q1)
10. [Betty Yuen Kwan Law](#)<sup>#</sup>, Simon Wing Fai Mok, Wai Kit Chan, Su Wei Xu, An Guo Wu, Xiao Jun Yao, Jing Rong Wang, Liang Liu\* and Vincent Kam Wai Wong\*. Hernandezine, a Novel AMPK Activator Induces Autophagic Cell Death in Drug-resistant Cancers. *Oncotarget*. 2016 Jan 22. doi: 10.18632/oncotarget.6980. (IF: 5.0; Q1)
11. Vincent Kam Wai Wong, Hang Dong, Xu Liang, Li Ping Bai, Zhi-Hong Jiang, Yue Guo, Tony A.-N Kong, Rui Wang, Richard Kin Ting Kam, [Betty Yuen Kwan Law](#), Wendy Wen Luen Hsiao, Ka Man Chan, Jingrong Wang, Rick Wai Kit Chan, Jianru Guo, Wei Zhang, Feng Gen Yen, Hua Zhou, Elaine, Lai Han Leung, Zhiling Yu, Liang Liu\*. Rh2E2, a Novel Metabolic Modulator, Specifically Suppresses Tumor Cell Growth by Inhibiting Energy-based Metabolism. *Oncotarget*. 2016 Jan 18; doi: 10.18632/oncotarget.6934. (IF: 5.0; Q1)
12. An Guo Wu, Vincent Kam Wai Wong, Wu Zeng, Liang Liu\* and [Betty Yuen Kwan Law](#)<sup>\*</sup>. Identification of novel autophagic Radix Polygalae fraction by cell membrane chromatography and UHPLC-(Q)TOF-MS for degradation of neurodegenerative disease proteins. *Scientific Reports*. 2015 Nov 24; 5:17199. (IF: 5.228; Q1)
13. Wong VK, Wu AG, Wang JR, Liu L\*, [Betty Yuen Kwan Law](#)<sup>\*</sup>. Neferine attenuates the protein level and toxicity of mutant huntingtin in PC-12 cells via induction of autophagy. *Molecules*. 2015, 20, 3496-3514. (IF: 2.465; Q2)

14. [Betty Yuen Kwan Law<sup>#</sup>](#), Mo KF, Wong VK\*. Autophagic effects of Chaihu (dried roots of Bupleurum Chinense DC or Bupleurum scorzoneraefolium WILD). *Chinese Medicines*. 2014 Sep 11;9:21. (IF: 1.58;Q2)
15. [Betty Yuen Kwan Law<sup>#</sup>](#), Chan WK, Xu SW, Wang JR, Bai LP, Liu L\* & Wong VK\*. Natural small-molecule enhancers of autophagy induce autophagic cell death in apoptosis-defective cells. *Scientific Reports*. 2014, 4, 5510. (IF: 5.228;Q1)
16. Wu AG, Wong VK, Xu SW, Chan WK, Ng CI, Liu L\* and [Betty Yuen Kwan Law<sup>#</sup>](#)\*. Onjisaponin B derived from Radix Polygalae enhances autophagy and accelerates the degradation of mutant  $\alpha$ -synuclein and huntingtin in PC-12 cells. *Int. J. Mol. Sci.* 2013, 14, 22618-22641. (IF: 3.257;Q2)
17. Wong VK, Li T, [Betty Yuen Kwan Law<sup>#</sup>](#), Ma EDL, Nga CY, Francesco M, Law CKM, Zhang M, Lam YC, Chan PL and Liu L. Saikosaponin-d, a novel SERCA inhibitor induces autophagic cell death in apoptosis-defective cells. *Cell Death & Diseases*, 2013 Jul 11;4:e720. (IF: 5.378;Q1)
18. Wong VK, C.B. Ko and [Betty Yuen Kwan Law<sup>#</sup>](#)\*. TRI001 is a novel activator of autophagy via an mTOR-dependent mechanisms. *European Journal of Cancer*, 2013; vol. 49, Suppl. 1, S4.
19. Chan GH<sup>#</sup>, [Betty Yuen Kwan Law<sup>#</sup>](#), Chu JM, Yue KK, Jiang ZH, Lau CW, Huang Y, Chan SW, Ying-Kit Yue P, Wong RN. Ginseng extracts restore high-glucose induced vascular dysfunctions by altering triglyceride metabolism and downregulation of atherosclerosis-related genes. *Evid Based Complement Alternat Med*. 2013;2013:797310. #Authors with equal contribution. (IF: 1.931;Q2)
20. [Betty Yuen Kwan Law<sup>#</sup>](#), Mingfu Wang, Dik-Lung Ma, Fawaz Al-Mousa, Francesco Michelangeli, Alice Wong, Margaret Ng, Ka-Fai To, Anthony Y.F. Mok, Rebecca Y. Y. Ko, Sze Kui Lam, Feng Chen, Chi-Ming Che, Pauline Chiu, and Ben C.B. Ko. Alisol B, a novel inhibitor of the SERCA pump, induces autophagy, ER-stress and apoptosis. *Molecular Cancer Therapeutics*, 9(3), 718-730, 2010. (IF: 5.579;Q1)

#### 著作

[Betty Yuen Kwan Law<sup>#</sup>](#), Vincent Wong Kam Wai. **Book title:** Autophagy in Current Trends in Cellular Physiology and Pathology; **Chapter title:** Autophagy In Multidrug-Resistant Cancers (MDR) *Chapter 20 Page 435-454*; ISBN 978-953-51-2726-0; *InTech Publishing, Croatia*. June 2016.

## 獲批的科研項目

### Macao Foundation

1. The mechanistic study of the autophagic effect of Nerferine, an alkaloid isolated from the green seed embryo of *Nelumbo nucifera Gaertn*, on neurodegenerative conditions (Project Code: 0212) (2012-2013/成功申請並結題)

### Macao Science and Technology Development Fund (FDCT)

2. Discovery of novel autophagic enhancers from Chinese medicinal herbs as potential candidate agents for the treatment of neurodegenerative conditions

(Project Code: 076/2011/A3)(2012- 2015/成功申請並結題)

3. Characterization and isolation of active autophagy components from *Radix Polygalae* (Yuan Zhi) for the modulation of age-related neurodegenerative diseases

(Project Code: 090/2013/A3) (2013-進行中)

## 任教科目

### 本課課程 (UG)

- Biochemistry 生物化學
- Biochemistry(Laboratory) 生物化學實驗
- Biochemistry & Molecular Biology 生物化學及分子生物學
- Biochemistry & Molecular Biology (Laboratory) 生物化學及分子生物學實驗

### 研究生課程 (PG)

- Modern Biotechnology 現代生物技術
- Advances in Chinese Medicine Pharmaceutics 中藥學研究進展
- Clinical Pharmacology 臨床藥理學
- Professional English 專業英語 (課程統籌人)
- Pharmaceutical English 藥學英語(課程統籌人)
- Clinical English on Chinese medicine 醫學英語(課程統籌人)

## 培養之博士研究生及研究助理

- Mr. An-Guo Wu (M.Phil.) (2012- 2016) *Ph.D. Student*  
(PhD) (2016-Present) *Postdoc fellow*  
(Postgraduate Student Award 2014 研究生科技研發獎 2014,  
Macao Science and Technology Development Fund)
- Mr. Zeng Wu (M.Phil.) (2013- Present) *Ph.D. Student*
- Miss Yu Lu (M.Phil.) (2016-Present) *Ph.D. Student*

- Mr. Tang Bin (B.Sc.) (2016-Present) *Master student*
- Mr. Lo Hang Hong (UG) (2016) *Under-graduate*
- Miss Choi-In Ng (B.Sc.) (2013- 2014) *Research Assistant*

#### 擔任期刊審稿人

- PLOS One (*IF: 3.057*)
- Journal of Cellular Biochemistry (*IF:3.446*)
- Toxins (*IF: 3.571*)
- Scientific reports (*IF: 5.228*)
- Pharmacological Research (*IF:4.816*)
- Molecules (*IF:2.465*)
- Phytomedicine (*IF:2.937*)
- Oncotarget (*IF: 5.0*)

#### 專業資格

- ✧ Member of the Macau Laboratory Technologist Association (MLTA, Macao)
- ✧ Member of Organisation for Oncology and Translational Research (OOTR, HK)
- ✧ Postgraduate students management committee, MUST (Deputy officer)
- ✧ Holder of the “Certificate in Teaching and Learning in Higher Education” (Educational Development Centre, MUST)
- ✧ Executive Council Member of the Board of Specialty Committee of Immunology of Traditional Chinese Medicine of the World Federation of Chinese Medicine Societies.
- ✧ Executive Council Member of Council of the International Consortium for Rheumatology Research

#### 參與之國際會議及報告

- ✧ Consortium for Globalization of Chinese Medicine 2012 (China, Macau) (*Invited Speaker, oral presentation*)
- ✧ 9th Annual Conference of the Organization for Oncology and Translational Research (OOTR) and Asian Oncology Summit (AOS) 2013 (Thailand, Bangkok) (*Invited Speaker, oral presentation*)
- ✧ Consortium for Globalization of Chinese Medicine 2013 (Austria, Graz) (*Poster presentation*)
- ✧ Consortium for Globalization of Chinese Medicine 2014 (Beijing, China) (*Poster presentation*)
- ✧ Departmental seminar, The University of Hong Kong (Department of

- Ophthalmology) Oct 2014 (*Invited Speaker, oral presentation*)
- ✧ The 1<sup>st</sup> Annual Meeting of the Specialty Committee of Immunology of Traditional Chinese Medicine of the World Federation of Chinese Medicine Societies cum the Cross-Strait Forum on Advanced Research on Treatment of Rheumatism with Chinese Medicine (2014·GuangZhou·China) (*Conference abstract*)
  - ✧ The 2<sup>nd</sup> Annual Meeting of the Specialty Committee of Immunology of Traditional Chinese Medicine of the World Federation of Chinese Medicine Societies cum the Cross-Strait Forum on Advanced Research on Treatment of Rheumatism with Chinese Medicine (2015·Macau·China) (*Invited Speaker, oral presentation*)
  - ✧ Shanghai Institute of Materia Medica, Chinese Academy / Macau University of Science and Technology - State Key Laboratory of Chinese Medicine Quality Joint Seminar 2015 (*Invited Speaker, oral presentation*)
  - ✧ International Symposium on Cognitive and Developmental Neuroscience: From Molecule to Behaviour 2015- Brain and Mind Institute, CUHK
  - ✧ BIT's 14th Annual Congress of International Drug Discovery Science and Technology-South Korea 2016 (IDDST- Gyeonggi-South Korea-2016 June) (*Invited Speaker, oral presentation*)
  - ✧ Laboratory Seminar: Roles and implications of autophagy in cancer biology. Division of Neurosurgery, Department of Surgery, The University of Hong Kong, June 2016. (*Invited Speaker, oral presentation*)
  - ✧ Symposium on Biophysics and Cutting Edge Technology: Charting the Future Medicine cum Inaugural Meeting of International Consortium for Rheumatology Research (2016·Zhongshan·China) (*poster presentation*)
  - ✧ Chinese Academy of Medical Sciences --- Lancet Health Summit (2016·Beijing·China)
  - ✧ Academic report of FDCT 2016 (Macao) 2016 年度科學技術發展基金第二次科研項目學術報告會(*Invited Speaker, oral presentation*)