CCM 文件 04/2015

香港中文大學與中醫藥有關的癌症研究工作

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背景 -

中文大學數個研究所和學系現正進行有關中醫藥與癌症方面的研究.

本簡報僅報告其中一些主要的研究項目, 其它項目可能有遺漏.

I. 中大中醫中藥研究所的研究項目

香港中文大學中醫中藥研究所
植物化學與西部植物資源持續利用國家重點實驗室夥伴實驗室
（香港中文大學）

CUHK ICM

抗腫瘤中藥的臨床前研究

食物及衞生局
醫療衞生研究基金
PI: professor Clara Lau

National Institute of Health, Grant P50, USA

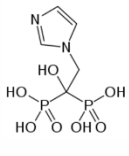
國家重點實驗室夥伴實驗室研究經費

薑黃及癌症化療藥物在結直腸癌的共同作用之研究

"Evaluation of the efficacy of the combination of Turmeric and chemotherapeutics in colorectal cancer treatment--a preclinical study"

雲芝與節拍器式雙磷酸鹽在抑制乳癌增殖及骨轉移的共同作用之研究

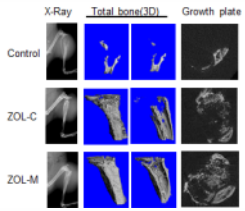
"Investigation of the inhibitory effects of metronomic zoledronate in combination with *Coriolus versicolor* in cancer propagation and bone metastasis in breast tumour rodent model"



與美國紀念斯隆-凱特琳癌症中心合作研究植物免疫調節劑

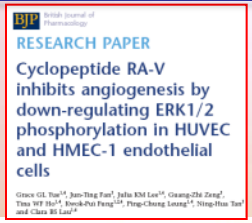
"Investigation on botanical immunomodulators" with Memorial Sloan-Kettering Cancer Center, New York, USA

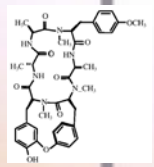

Contents lists available at ScienceDirect
Vaccine
journal homepage: www.elsevier.com/locate/vaccine
ELSEVIER
Evaluation of widely consumed botanicals as immunological adjuvants
Govind Ragupathi, K. Simon Yeung, Ping-Chung Leung, Mavis Lee, Clara Bik San Lau, Andrew Vickers, Chandra Hood, Gary Deng, Nai-Kong Cheung, Barrie Cassileth, Philip Livingston




Contents lists available at ScienceDirect
International Immunopharmacology
journal homepage: www.elsevier.com/locate/intimp
ELSEVIER
Echinacea purpurea (L.) Moench modulates human T-cell cytokine response
Fabiana N. Fonseca, Genovefa Papanicolaou, Hong Lin, Clara B.S. Lau, Edward J. Kennelly, Barrie R. Cassileth, Susanna Cunningham-Rundles

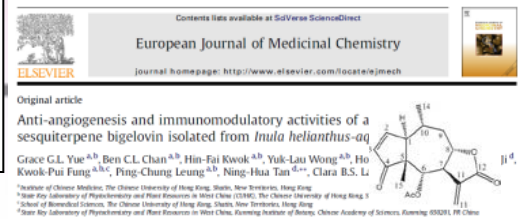
與夥伴實驗室昆明植物研究所合作研究各類植物天然產物的抗腫瘤藥效


BJP British Journal of Pharmacology
RESEARCH PAPER
Cyclopeptide RA-V inhibits angiogenesis by down-regulating ERK1/2 phosphorylation in HUVEC and HMEC-1 endothelial cells




Contents lists available at SciVerse ScienceDirect
Toxicology and Applied Pharmacology
journal homepage: www.elsevier.com/locate/ytaap
ELSEVIER


Eriocalyxin B induces apoptosis and cell cycle arrest in pancreatic adenocarcinoma cells through caspase- and p53-dependent pathways
Lin Li, Grace G.L. Yue, Clara B.S. Lau, Handong Sun, Kwok Pui Fung, Quanbin Han, Po Sing Leung


Contents lists available at SciVerse ScienceDirect
European Journal of Medicinal Chemistry
journal homepage: http://www.elsevier.com/locate/ejmech
ELSEVIER
Original article
Anti-angiogenesis and immunomodulatory activities of a sesquiterpene bigelovin isolated from *Inula helianthus-aq*
Grace G.L. Yue, Ben C.L. Chan, Hin-Fai Kwok, Yuk-Lau Wong, Ho Kwok-Pui Fung, Ping-Chung Leung, Ning-Hua Tan, Clara B.S. Li

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抗腫瘤中藥的臨床研究

3 Approaches: Supplementary – Relief during active treatment 治病求本
Palliative – Prevention of metastases 既病防變
Prevention – Preventive of recurrence 治未病

Past Experience:

Supplementary

- Herbal Formula as Supplement agent to reduce chemotoxicity

A double-blind placebo-controlled randomized study of Chinese herbal medicine as complementary therapy for reduction of chemotherapy-induced toxicity (2005)

T. S. K. Mok[1]*, W. Yeo[1], P. J. Johnson[2], P. Hui[1], W. M. Ho[1], K. C. Lam[1], M. Xu[3], K. Chak[1], A. Chan[1], H. Wong[1], F. Mo[1] & B. Zee[1,4]

- Yunzhi & Danshen to reduce irradiation symptoms of NPC patients

Immunomodulatory Activities of Yunzhi and Danshen in Post-treatment Breast Cancer Patients (2005)

Chun-Kwok Wong,* Yi-Xi Bao,†,‡ Eliza Lai-Yi Wong,† Ping-Chung Leung,† Kwok Pui Fung† and Christopher Wai Kei Lam*

Palliative

TCM vs Clondronate to reduce bone metastases & QoL

ORAL CHINESE MEDICINE FORMULA IMPROVED QUALITY OF LIFE IN PATIENTS WITH MALIGNANT TUMOR BONE METASTASIS DISEASES (2007)

Kalina K. Wu, School of Nursing, The Hong Kong Polytechnic University, Hong Kong, Hong Kong, China, Li Zhao, School of Chinese Medicine, Kumta SM, Deparment of Orthopaedics and Traumatology, PC Leung, Institute of Chinese Medicine, The Chinese University of Hong Kong, Hong Kong, Hong Kong, China

Prevention

Yunzhi, Danshen on Immunological function in Healthy subject

Immunomodulatory effects of Yun Zhi and Danshen capsules in health subjects—a randomized, double-blind, placebo-controlled, crossover study

C.K. Wong[a], P.S. Tse[a], E.L.Y. Wong[b], P.C. Leung[b], K.P. Fung[b], C.W.K. Lam[a,*]

II.香港中西醫結合醫學研究所
研究項目

Electroacupuncture Analgesia In Patients With Inoperable Pancreatic Cancer: A Randomized, Sham-controlled Study

Charing Chong, Stephen Chan, WW Leung, William Cheung, Simon Chan, Paul Lai, Justin Wu

- Study Objective:
  - to investigate the efficacy and safety of electroacupuncture in reducing pancreatic cancer pain in patients suffering from inoperable pancreatic cancer.
- Hypothesis:
  - electroacupuncture is effective in relieving pain and decreasing the need for analgesics in patients with inoperable pancreatic cancer.

Electroacupuncture Analgesia In Patients With Inoperable Pancreatic Cancer: A Randomized, Sham-controlled Study

- Research Method:
  - **Design:** Randomized, Sham-controlled trial
  - **Setting:** University affiliated hospital
  - **PRIMARY OUTCOME:** Pain scores in numeric rating scale at 1 month
  - SECONARY OUTCOMES: analgesic reduction; procedural discomfort; willingness to repeat the procedure; morbidities relating to the procedures; and quality of life (QOL) scores.

Electroacupuncture Analgesia In Patients With Inoperable Pancreatic Cancer: A Randomized, Sham-controlled Study

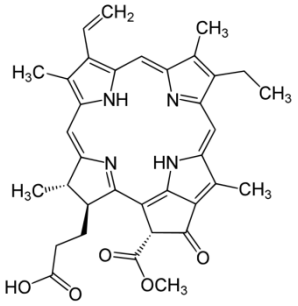
- Expected Clinical Impact:
  - Proving the safety and effectiveness of electroacupuncture to improve pain relief, reduce the need of opioid analgesics.
  - Hence, provide a better quality of life in patients with inoperable pancreatic cancer.
  - Given the widespread acceptance of electroacupuncture in Hong Kong, appropriately powered randomized controlled trials are needed to confirm its safety and effectiveness.
  - The results of this study can help to establish the use of electroacupuncture in palliative care and enhance the integration of Chinese and Western Medicine in patients with terminal malignancy.

III. 中醫學院研究項目

1. Development of novel photosensitive drugs for photodynamic therapy on prostate cancer from traditional Chinese Medicines

Project title	Funding source	Current status
The study of cell death mechanism of prostate cancer cell using pheophorbide A in photodynamic therapy	CUHK Research Committee Funding	Finished

Scutellaria Barbata
(半枝蓮)



Pheophorbide-a
脫鎂葉綠甲酯酸A

Publications

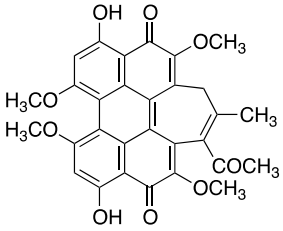
1. Xu DD; Lam HM, Hoeven R., Xu CB, Leung AW, Cho CS. Photodynamic therapy induced cell death of hormone insensitive prostate cancer PC-3 cells with autophagic characteristics. Photodiagnosis Photodyn Ther. 2013;10(3):278-87

2. Xu D; Cho WC; Wu P.; Lam H, Leung WN. Photo-activated pheophorbide a inhibits the growth of prostate cancer. Laser Phys. 2011;21:1670-1674

2. Development of novel sonosensitive drugs for sonodynamic therapy on tumor from traditional Chinese Medicines

No.	Project title	Funding source	Current status
1	Sonodynamic deactivation of liver cancer cells using hypocrellin from Chinese herbs	CUHK Research Committee Funding	Finished
2	新型中草藥聲敏藥物和靶向聲敏藥物的研發	深圳市科學技術創新委員會技術開發項目	Finished

***Hypocrella bambuase* (*竹红菌*)**



Hypocrellin
竹紅菌甲素

Publications

1. Wang X, Luo J, Leung AW, Li Y, Zhang H, Xu C**. Hypocrellin B in hepatocellular carcinoma cells: subcellular localization and sonodynamic damage. *Int J Radiat Biol.* 2015 Feb 6:1-8 doi:10.3109/09553002.2015.1001532**

2. Chen L, Bai G, Yang S, Yang R, Zhao G, Xu C, Leung W. Encapsulation of curcumin in recombinant human H-chain ferritin increases its water-solubility and stability. *Food Research International*. 2014;62:1147–1153

3. Wang X, Leung AW, Jiang Y, Yu H, Li X, Xu C. Hypocrellin B-mediated sonodynamic action induces apoptosis of hepatocellular carcinoma cells. *Ultrasonics*. 2012;52(4):543-6

4. Wang X, Xia X, Xu C, Xu J, Wang P, Xiang J, Bai D, Leung AW. Ultrasound-induced cell death of nasopharyngeal carcinoma cells in the presence of curcumin. *Integr Cancer Ther*. 2011;10(1):70-6

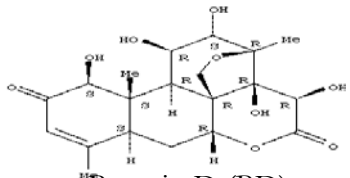
3. Developing Brucein D (鴉膽子苦素D) as a Novel Anti-Pancreatic Cancer Agent: In Vivo Evaluations on Its Efficacy, Safety and Action Mechanisms.

香港中文大學醫學院
Faculty of Medicine
The Chinese University of Hong Kong
Transforming our **Passion** *into* **Perfection**

林志秀, 梁寶成, 林鴿, 馮國培

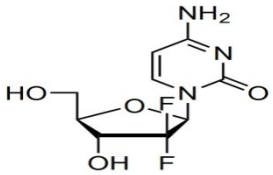
Funding source: GRF/RGC; On-going.

Combination effect of GEM/5-FU and Brucein D against PANC-1 and Capan-2 cells



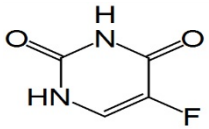
Brucein D (BD)

+



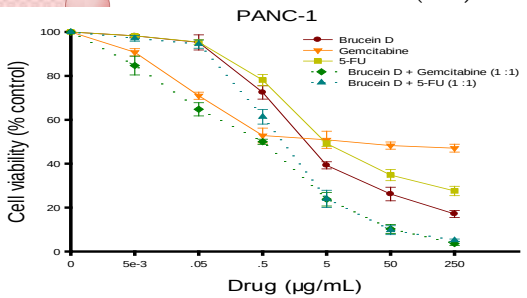
Gemcitabine (GEM)

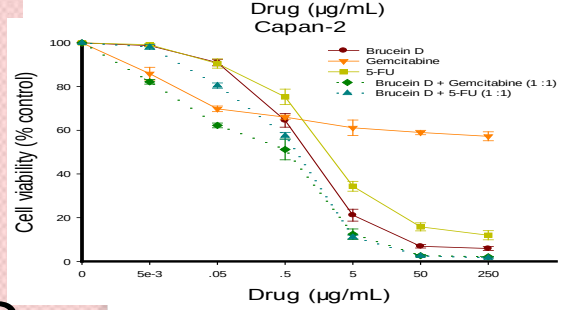
/



5-FU

A





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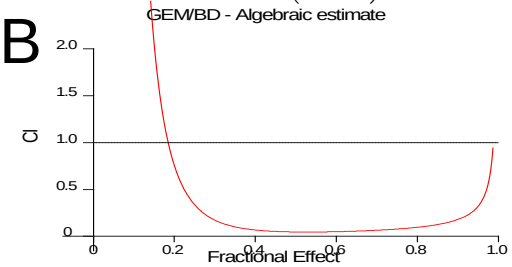
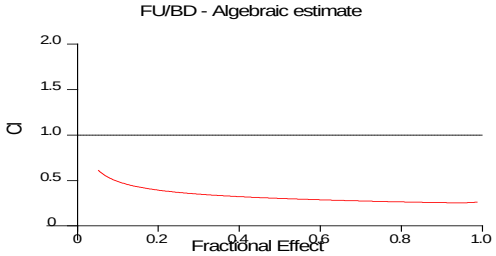
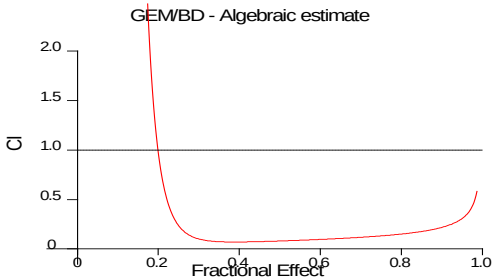
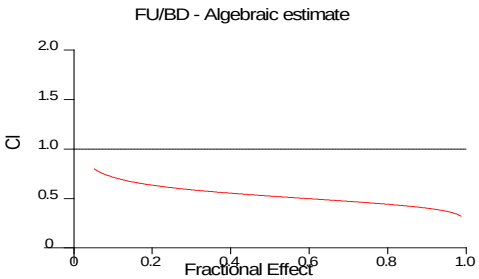
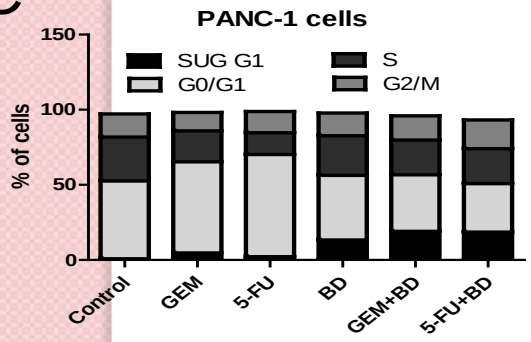


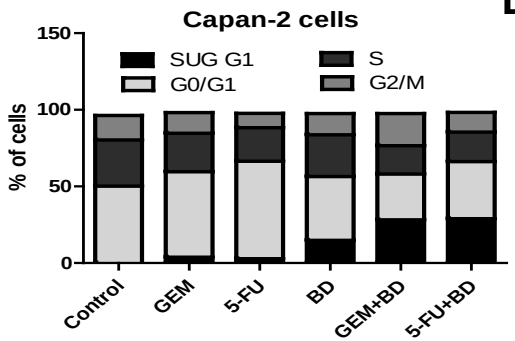




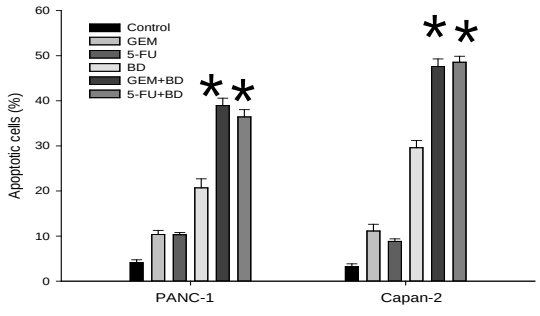


C



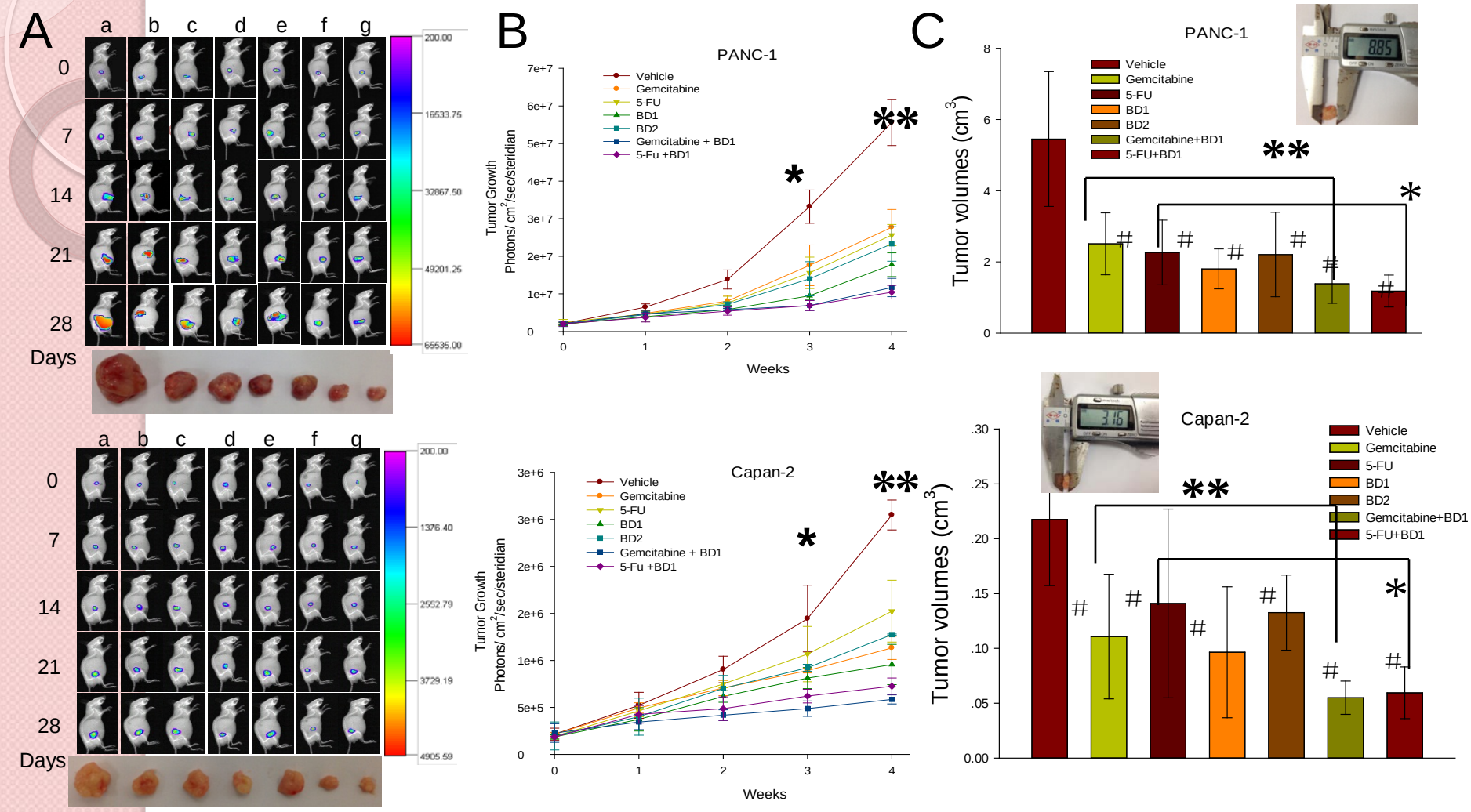


D



(**A**) Dose-response curves of PANC-1/Capan-2 cells to GEM/5-FU, or GEM/5-FU and BD combination (GEM/5-FU+BD).
(**B**) Combination index across the fraction affected (Fa). CI>1 indicates antagonism, CI=1 indicates additive effect, and CI<1 indicates synergy.
(**C**) The cell cycle distribution profiles of the cells were determined by flow cytometry.
(**D**) Determination of apoptotic cells by annexin V-PI staining. Columns, mean of three experiments; bars, S.E.,*P < 0.05, combination treatment group compared with control group, single treatment with GEM, 5-FU, BD group.

Brucein D potentiates the effect of GEM/5-FU to inhibit the growth of pancreatic cancer in nude mice



(**A**) Bioluminescence In-Vivo FX PRO images of orthotopically implanted pancreatic tumors in live, anesthetized mice under different treatment regimens. (a. untreated control; b. GEM; c. 5-FU; d. BD1; e. BD2; f. GEM + BD1; g. 5-FU + BD1).).

(**B**) Measurements of photons per second depicting tumor volume at various time points using live bioluminescence imaging at the indicated time points . Points, mean; bars, Std; n=6 for each treatment group (** denotes p<0.001, * denotes p<0.01 as determined by two-way ANOVA)

(**C**) Tumor volumes in mice measured on the last day of the experiment at autopsy with vernier calipers and calculated using the formula V=4/3π(a/2*b/2*c/2) (n=6). Columns, mean; bars, Std (# p<0.001 vs. vehicle control determined by two-way ANOVA, *, ** p<0.05 determined by unpaired Student's t test).

IV. 生物醫學學院研究項目

香港中文大學醫學院
Faculty of Medicine
The Chinese University of Hong Kong

Project 1.

PI: Professor FUNG Kwok Pui 馮國培教授

Title: Mechanistic Study of the Anti-proliferative Effect of Pheophorbide a (脫鎂葉綠甲酯酸A), a Component Purified from Scutelleria Barbata半枝蓮, on Breast Tumor Cells in Vitro and in Vivo.

Founding source:HK$735,352 from Research Grants Council (Earmarked Grants) during the period Oct. 1, 2007 to Sept. 30, 2009

Project 2:

PI: Professor LIN Ge 林鴿教授.

Title: Biomarker for pyrrolizidine (吡咯里西啶) alkaloids and their *N*-oxides intoxication? challenging but feasible.

Founding source:

HK$822,731 from Research Grants Council (Earmarked Grants) during the period Jan. 1, 2004 to Dec. 31, 2016.

Project 3:

PI: Professor LIN Ge 林鴿教授.

Title: Beneficial interaction between Chinese Medicine *Marsdenia tenacissima* 通光藤 and anti-cancer drugs via reversal of ABC drug transporter-mediated multidrug resistance.

Founding source:

HK$983,280 from Food and Health Bureau (HHSRF) during the period Feb. 10, 201 to Feb. 9, 2013

V. 理學院生命科學學院研究項目

Effects of herbal medicine and small molecules on cancer 中草藥對腫瘤的療效

Professor Ho Wing Shing 何永成教授
School of Life Sciences, CUHK

Area of research

1.Screening of herbal medicine with anti-cancer properties in different cancer cells.
2.In vivo studies of active fractions and/or its active compounds in animal models.
3.Attempts are being made to file patents on novel fractions and combination of compounds with medicinal properties.

4. Assessment of the therapeutic benefits and toxicity of active fractions and compounds in Animal models.
5. Exploitation of the potential health benefits of herbal extracts as food supplements or medical supplements.

The research has been supported in part by

i.Research contracts from companies that are interested in herbal medicine.
ii.Part of the research work on small molecule was supported by the ITF grant.
iii.Attempts have been made to establish partnership with investors and to commercialize the herbal products.

Thank you for your attention!