



生物科技學系

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## 楊進木 教授

### 研究興趣

**核心概念 :** 分子交互作用家族, Molecular interface families, MIF 跨物种同源結構系統生物

**科學方向及突破Highlight :** 智慧計算解決生物  
解決重要議題

我們是全球第一提出分子交互作用家族(molecular interaction family)：包含「同藥理蛋白質家族(Pharmalogs: protein-ligand family)」：一群具有相似結合環境(binding environment)的蛋白質與一群具有相似官能基的分子」、「蛋白質 - 蛋白質交互作用家族(Protein-protein interaction family)」及蛋白質複合體家族(protein complex family)」，以這些新穎理論為基礎，本團隊已建立全面性藥物 - 蛋白質 - 生化途徑 - 細胞行為(疾病機制)的網路，開創了多標靶藥物、舊藥新用、天然藥物 / 中草藥開發、疫苗發展、及治療複雜疾病(如癌症)的新契機。本團隊持續發展的藥物篩選軟

體 GEMDOCK 及 iGEMDOCK 是台灣(亞洲)第一個，也是在世界上計算藥物篩選領域中常被使用的軟體之一(相關論文被引用數已超過800次)，同時此軟體也獲得國家新創獎。本團隊已與超過40個國內外實驗室及臨床醫師進行合作研究，包含學術界、多個教學醫院/醫學中心、國家型機構、及產業界等，例如王惠鈞院士、龔行健院士、蔡明道院士、吳妍華院士、中國醫大張建國副院長、高醫大鐘育志校長、高醫大余明隆副校長、美國哈佛大學Professor Bruce S. Kristal、澳洲Professor Mark von Itzstein(第一個抗流感藥物瑞樂沙發明者)、及日本京都大學Professor Tatsuya Akutsu等，發表超過90篇論文，也發現超過45個先導藥物，獲得七項專利(包含三項美國專利、三項ROC專利及一項中國專利)，為解決生物臨床重要議題。

**近期研究成果 :** 智慧計算精準醫藥平台(科技部四年期AI計劃)

**產業能量**

2018 未來科技展 Future.Tech

科技突破獎 最佳人氣獎

4 台灣/大陸專利

3 項美國專利

≥ 45 國際期刊發表

≥ 90 產學小聯盟

2014 MOST

國家新創獎 GEMDOCK

**科學突破**

nature COMMUNICATIONS

Membrane protein-regulated networks across human cancers CaMPNet

Article | Open Access Published: 18 July 2019

Chia-Jui Lin, Chih-Ming Lin, Yih-Chun Chang, Jing-Pei Lee, Wei-Lan Chu, Yan-Hua Wu, Lee, Tsu-Jui Jeng, Jerry Kang, Liang-Ting Chen, Li-Ching Chen, Chih-Hung Lin, Chi-Hsin Tu, Yuan-Sen Hsu & Jui-Jiann Tang

Nature Communications 10, Article number: 3131 (2019) DOI: 10.1038/s41467-019-11366-z

Accesses: 1 Citations: 28 Altmetric Metrics: 8

TAIPEI TIMES

Study says antidepressant could inhibit breast cancer

Researchers from National Chiayi University (NCTU) and Taipei Medical University (TMU) have found that the antidepressant imipramine can be used as an anti-mitotic drug for inhibiting breast cancer.

Confined animal experiments have confirmed the finding, as an NCTU team said at a news conference in Hsinchu, where the schools is based.

**跨領域產學醫**

國際合作

MOU 合作意向書

日本京都大學 Kyoto University Prof. AKUTSU

臺灣神隱 MERIDIANT 宜捷生技

產業合作

華碩生技 Chiconix 华硕生技 OneKey 華聯生技

醫院合作

高醫醫學醫院 中國醫藥學院

臺北醫學大學 台大醫院

臺中慈濟醫院 三軍總醫院

學研合作

國立交通大學 National Kaohsiung Normal University

中央研究院 Academia Sinica

國家衛生研究院 National Health Research Institutes



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## Jinn-Moon Yang, Ph.D.

### Research Interests

**研究目標：**建立藥物 - 蛋白質 - 生化途徑 - 疾病機制的關連  
建立基礎研究 - 轉譯醫學 - 產業的連結

**Original ideas:** Molecular interface families, MIF (protein-drug, protein-protein, and protein-DNA) Homologous structural systems biology

**Research:** Our research focused on computer-aided drug design (GEMDOCK and SiMMMap), structural bioinformatics (3D-BLAST, (PS)2 and fastSCOP), and systems biology (PPISearch, 3D-partner and CaMPNet), especially investigating the molecular interfaces (e.g., protein-protein, protein-DNA, protein-ligand interactions). By integrating large in-house MIF/structures/omics databases & tools and various public databases, we have

successfully constructed dynamic compound-protein-pathway-disease networks across well-known species (e.g., human, mouse, zebrafish, and yeast) and developed artificial intelligence (AI) frameworks to study cell behaviors and disease mechanisms. For the validations and applications of our models, we have rigorously collaborated with biological research teams, such as led by Kung, H.J. (龔行健院士), Tsai, M.D. (蔡明道院士), Wang, A.H. (王惠鈞院士), and Wu Lee, Y.H. (吳妍華院士), as well as some clinical teams, such as Chang, J. G. (張建國副院長), Jong, Y.J. (鐘育志校長), and Yu, M.L. (余明隆副校長), to solve biological issues and unmet clinical needs.

**Highlight:** Intelligent Computing Precision Medical and Drug Development Platform (MOST AI granted research)

**Industrial Energy**

2018 未來科技展 Future.Tech

"Futuretech Breakthrough Award" & "Best Press Attention Award"

4 Taiwan/China Patents

3 US Patents

Lead Compounds ≥ 45

SCI papers ≥ 90

Award for Innovation Award for Academic-in Taiwan GEMDOCK Industry Cooperation

2014 MOST

**Scientific Breakthrough**

Article | Open Access | Published: 26 July 2012

Membrane protein-regulated networks across human cancers

CaMPNet

Chen Yu-Chi, Chia-Hua Lee, Y-Hsuan Chuang, Liang-Wu Lin, Yifan Xie, Chia-Nan Lin, Yen-Hua Pei, Lih-Jiun Jong, Jian-Guo Huang, Jing-Han Huang, Li-Ching Chen, Chia-Lung Lin, Zhi-Min Yu, Yuan-Kun Lin, I-Ping Wu, Jui-Jen Ho, and Yung-Yu Lin

Nature Communications | 3:333 | DOI: 10.1038/ncomms333 | Download Citation | Metrics | License

TAIPEI TIMES

Study says antidepressant could inhibit breast cancer

Researchers from National Chiao Tung University (NCTU) and Taiwan Institute of Technology (TIK) recently discovered that the antidepressant sertraline can be used as an anti-cancer drug for triple-negative breast cancer.

Cat and animal experiments have confirmed their finding. An NCTU team said at a news conference in Hsinchu, where the school is based.

**Collaboration**

**International**

日本京都大學 Prof. Akutsu

MOU agreement

THE INSTITUTE FOR CHEMICAL REACTIVITY AND POLYMER PROPERTY LABORATORY, KYOTO UNIVERSITY, JAPAN

THE COLLEGE OF POLYCHMICAL SCIENCE AND TECHNOLOGY, JINAN UNIVERSITY, CHINA

The Institute for Chemical Reactivity and Polymer Property Laboratory, Kyoto University, Japan, and The College of Polychemical Science and Technology, Jinan University, China, have signed an agreement on the research exchange and cooperation.

**Industrial**

台灣神隆

晶碩生技

英聯生技

臺灣工研院

NVIDIA

Co-publication

NYU

Prof. Lung-Chi Chen

Co-poster in conference

SOT

58TH ANNUAL MEETING

6 TexExpo · MARCH 10-14, 2019

**Hospital**

高醫醫學院

中國醫藥學院

臺北醫學大學

台大醫院

慈濟上品數字

三軍總醫院

**Academics**

國立交通大學

中央研究院

Academia Sinica

國家衛生研究院