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Prof. Bai received her Bachelor and Mphil degrees from Liaoning University of Traditional Chinese Medicine in 2001 and 2004, respectively. In 2008, she obtained her PhD degree from Hong Kong Baptist University. She has been in The Institute of Scientific and Industrial Research (SANKEN), Osaka University, Japan, as a visiting research scholar carrying out the G-quadruplex DNA-binding study of benzophenanthridine alkaloids from October 2006 to January 2007. After graduation, she joined School of Chinese Medicine, Hong Kong Baptist University as a research assistant in 2008, senior research assistant in 2009 and research associate in 2010. In September 2011, she moved to State Key Laboratory of Quality Research in Chinese Medicine, Macau University of Science and Technology as an assistant professor. In 2015, she achieved an accelerated promotion to an associate professor. In 2023, she was promoted to a full professor.

Prof. Bai's research fields include bioorganic chemistry, medicinal chemistry and natural medicinal chemistry. Her research focuses on bioactive ingredients in traditional Chinese medicines (TCMs), design and synthesis of bioactive small organic molecules, and their pharmacodynamic evaluations as anticancer agents, viral entry inhibitors against SARS-CoV-2 and molecules inhibiting pulmonary fibrosis. Recently, Prof. Bai has a strong interest in designing and synthesizing

innovative cationic sphingolipids (Chinese Patent No. ZL202210358677.7) in constructing lipid nanoparticles (LNPs) that can effectively deliver RNA, including siRNA and mRNA, for both cancer therapy and vaccine development. Additionally, she also focuses on discovery of medicinal molecules or TCMs-derived active components against pulmonary fibrosis.

. She had also been engaged in the project of Authentication of the 31 Species of Toxic and Potent Chinese Materia Medica by Microscopic Technique in Hong Kong.

She has published more than 100 research articles in SCI journals including

and . She has obtained 24 patent approvals (including 5 U.S. patent approval), and 1 Chinese invention patent has achieved technology transfer to HEC Cordyceps Co., Ltd. Hengqin Zhuhai. Since 2013, Prof. Bai achieved the Bank of China Excellent Research Award (2013), Excellent Teaching Award of Macau University of Science and Technology (2019), and Third Natural Science Award in Macao (2020). Her research was financially supported by Macao Science and Technology Development Fund, and The Macao Foundation. As a principal investigator, she has obtained more than research grants including

(PI of the first subprojects on both "Intelligent Identification of Chinese Medicinal Materials Using Computer Vision Technology" and "In-depth analysis and sample library establishment of triterpene saponins from edible traditional Chinese medicines"),

, and . As a co-investigator, she also participated in research projects of "Guangdong-Hong Kong-Macao Joint Laboratory of Respiratory Infectious Diseases (2020-2022)" financially supported by Department of Science and Technology of Guangdong Province, "Class C Program of the Science and Technology of Shenzhen Guangdong-Hong Kong-Macao Greater Bay Area (2022)" funded by Shenzhen Municipal Committee of Science and Technology Innovation, and various projects supported by National Natural Science Foundation of China, and Natural Science Foundation of Guangdong Province. In addition, she also serves as an editorial board member of JOURNAL OF ANALYSIS AND TESTING.

2

# **Research Areas and Research Interests**

Research Area: Bioorganic and Medicinal Chemistry, Natural Medicinal Chemistry

#### Research Interest (2020-2025):

- Novel Sphingolipids' Synthesis and Application in Drug Delivery Systems (LNPs) for RNA Therapy
- 2) Research and Development of TCMs-derived or Synthetic Medicinal Molecules for the Treatment of Pulmonary Fibrosis;
- 3) Design, Synthesis and Pharmacodynamic Study of Anticancer Medicinal Molecules
- New Product Development of Active Ingredients Derived from Edible Traditional Chinese Medicines
- 5) Analysis of TCMs by TOF-SIMS
- 6) Development of Android Platform App for Identification of Chinese Medicinal Materials Using Artificial Intelligence (Collaboration with Prof. CAI Zhanchuan's Team)

# **Teaching Subjects**

1) <u>Postgraduates course</u>: Prospect and Progress in Chinese Medicine Research (Coordinator), Selected Topics of Chemistry of Chinese Materia Medica (Coordinator), Experimental Techniques in Chemistry of Chinese Materia Medica (Coordinator), etc.

2) <u>Undergraduates course</u>: Chemistry of Chinese Materia Medica, Experiments of Chemistry of CMM (Coordinator), Honor Projects (Coordinator).

### Academic Qualifications

2008.9	Ph.D., Hong Kong Baptist University, Hong Kong
2004.7	M. Sc., Liaoning University of Traditional Chinese Medicine, Shenyang, China
2001.7	B. Sc., Liaoning University of Traditional Chinese Medicine, Shenyang, China

#### Work Experience

2023.7-present

- 11) 2023.01-2023.12, Structural Modification of Components from Traditional Chinese Medicine and Their Antitumor Effects, Open fund project of State Key Laboratory of Oncology Chemogenomics Jointly-established by Ministry and Commission, Tsinghua Shenzhen International Graduate School, (grant number: SKLCO202210), , PI
- 10) 2022.02-2025.02, A cardiac glycoside, its synthesis method and application, Chinese mainland invention patent application project of Macao Science and Technology Development Fund, (grant number: 0011/2021/APT),
   , PI
- 9) 2021.03-2023.03, Improvement of Quality Standard and Clinical Research of the new Chinese Patent Medicine "Jade Butterfly Freckle Removal Cream", FDCT-GDST Joint Fund (FDCT project number 0043/2020/AGJ),
   PI
- 8) 2022.08-2025.08, Design, synthesis and antitumor activity of novel VEGFR-2/ Aurora A dualtarget inhibitors, Wuyi University-Hong Kong-Macau Joint R & D Fund Project (2021WGALH08), , PI of Macau
- 7) 2020.09-2023.09, Innovative drug research of novel S1P1 modulator for the treatment of idiopathic pulmonary fibrosis, FDCT-MOST Joint Fund (FDCT project number 0074/2019/AMJ), , PI
- 6) 2020.04-2021.04, Research and development of specially-effective Chinese medicines against novel coronavirus pneumonia, Macao Science and Technology Development Fund (FDCT project number 0064/2020/A), , PI

5) 2020.01-2023.01, Study on multi-dimensional quality control of six Chinese herbal medicines by combining artificial intelligence and multi-omics technologies, FDCT Key R & D research project (FDCT project number 0023/2019/AKP), , Co-PI. (PI of the first subproject on "Intelligent Identification of Chinese Medicinal Materials Using Computer Vision Technology")

- 4) 2019.06-2022.06, Construction of Alkaline Sphingomyelin-based Cationic Liposome and Application in Co-delivery of siRNA and Chemotherapy Drug, Macao Science and Technology Development Fund (FDCT project number 0004/2019/A1), , Principal Investigator
- 3) 2014.01-2018.01, Chemical Studies on Cardenolides in Plants and Evaluation of Their Hypoxia Inducible Factor-1 (HIF-1) Inhibitory Activity, Macao Science and Technology Development Fund (FDCT project number 056/2013/A2), , Principal Investigator
- 2) 2012.06-2014.11, GSH-guided isolation of IKK -modifying Epoxides from Chinese medicinal herbs and evaluation of their anti-inflammatory activities, Macao Science and Technology Development Fund (FDCT project number 063/2011/A3), , Principal Investigator
- 2012.01-2012.12, Comparative study of flavanols and flavonols binding to amyloid beta peptide by ESI-TOF-MS and MALDI-TOF-MS techniques, Macao Fundation (#0205), , Principal Investigator

# *Representative Publications* (\*: Corresponding authors; #: Co-first authors)

- Fu, Lu; Wang, Can-Can; Tian, Wenyue; Liu, Zhiyan; Bao, Meng-Yu; Liu, Jiazheng; Zhang, Wei; \*; Jiang, Zhi-Hong\*; Zhu, Guo-Yuan\*. NMR-guided isolation of antiinflammatory carabranolides from the fruits of L. , , , 1786-1797.
- 2) Liu, Jiazheng; Xu, Ting; Ding, Jianjun; Wen, Haoyue; Meng, Jieru; Liu Qing; Liu, Xiaomei; Zhang, Wei; Zhu, Guo-Yuan; Jiang, Zhi-Hong\*; Gao, Jing\*; \*. Discovery of Antimelanogenic Components in Persimmon ( ) Leaf Using LC-MS/MS-MN, AlphaFold2-enabled Virtual Screening and Biological Validation. , , , , 139814.
- Fu, Lu; Tian, Wenyue; Bao, Meng-Yu; Liu, Zhiyan; Ren, Wen-Jing; Liu, Jiazheng; Zhang, Wei;
   Zhang, Zhifeng; Gao, Jing; \*; Jiang, Zhi-Hong\*; Zhu, Guo-Yuan\*. Cevanine-type alkaloids from the bulbs of Htkvknnctkc wpkdtcevgcvc xct. y cdwgpuku cpf vjgkt cpvkŁdtqvke cevkxkvkgu

in vitro. , , , , , 114018.

- 4) Chen, Jian-Li; Jia, Xiao-Hui; Wu, Xuan; Yuan, Ming-Heng; Xia, Xinyue; Yin, Dan; Chen, Xu; Gu, Ze-Yun; Liu, Jia-Zheng; ; Luo, Kathy Qian; Wang, Jianfang; Zhu, Xiao-Ming\*. Kidney-targeted antioxidant salvianolic acid B nanoparticles restoring lysosome homeostasis for acute kidney injury therapy. , , , , , , , , , , , 151811.
- Lin, Zhi-Rong; Bao, Meng-Yu; Xiong, Hao-Ming; Cao, Dai; ; Zhang, Wei; Chen, Cheng-Yu; Jiang, Zhi-Hong\*; Zhu, Guo-Yuan\*. Boswellianols A–I, Structurally Diverse Diterpenoids from the Oleo-gum Resin of Boswellia carterii and Their TGF- Inhibition Activity. , , , 1074.
- 6) Lyu, Peilun; Liu, Jiazheng; Zhang, Yuhan; Ye, Ben; Lan, Ting; ; Cai, Zhanchuan\*; Jiang, Zhi-Hong\*. A Novel Feature Fusion Framework for Industrial Automation Single-Multiple Object Detection. , , , DOI:10.1109/TII.2024.3353814.
- 7) Chen, Fei-Long; Liu, Dong-Li; Ren, Wen-Jing; Xiong, Hao-Ming; ; Zhang, Wei; Hon, Chitin; Jiang, Zhi-Hong\*; Zhu, Guo-Yuan\*. Atrachinenins D-S, Novel Meroterpenoids with Geranyl Hydroquinone Moiety from Atractylodes chinensis by the LC/MS-based Molecular Decoy and Targeted Isolation. , , , , 107111.
- Wu, Yanqi; Guan, Yuhong; Huang, Peilin; Chen, Hui; ; Jiang, Zhi-Hong\*. Preparation of Norovirus GII Loop Mediated Isothermal Amplification Freeze-Drying Microsphere Reagents and Its Application in An On-Site Integrated Rapid Detection Platform. , , 109308.
- 9) Zhou, Mingyue; Yang, Ziwei; Yin, Tianpeng; Zhao, Yunfeng; Wang, Cai-Yun; Zhu, Guo-Yuan;
   ; Jiang, Zhi-Hong\*; Zhang, Wei\*. Functionalized Fe-Doped Carbon Dots Exhibiting Dual Glutathione Consumption to Amplify Ferroptosis for Enhanced Cancer Therapy.
   , , , 53228-53241.
- 10) Wang, Yue; Yu, Fei; Liu, Qinhua; Wang, Caiyun; Zhu, Guo-Yuan; ; Shi, Shuai;
  Zhao, Yunfeng; Jiang, Zhi-Hong\*; Zhang, Wei\*. A novel and sensitive dual signaling ratiometric electrochemical aptasensor based on nanoporous gold for determination of Ochratoxin A. , , 137192.

7

- 11) Liu, Qian-Bao; Liu, Jiazheng; Lu, Jing-Guang; Yang, Ming-Rong; Zhang, Wei; Li, Wen-Jia; Qian, Zheng-Ming; Jiang, Zhi-Hong\*; \*. Quantitative <sup>1</sup>H NMR with global spectral deconvolution approach for quality assessment of natural and cultured , 115603.
- 12) Lyu, Hao-Yuan; Bao, Meng-Yu; Io, Chi-Cheng; Xiong, Hao-Ming; Chen, Fei-Long;
  ; Zhang, Wei; Jiang, Zhi-Hong\*; Zhu, Guo-Yuan\*. Sesquiterpenoids from the roots of Aucklandia costus and their anti-inflammatory activities.
  , , , 105604.
- 13) Xiong, Hao-Ming; Li, Hui-Ying; Lin, Zhi-Rong; Liu, Xiao-Mei;
  ; Zhang, Wei;
  Jiang, Zhi-Hong\*; Zhu, Guo-Yuan\*. Chemical Constituents from the Fruits of Amomum kravanh and Their Role in Activating Alcohol Dehydrogenase.
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- 14) Zhang, Hui-Xia; Yu, Dian; Sun, Jian-Feng; Zeng, Ling; Wang, Cai-Yun; ; Zhu, Guo-Yuan; Jiang, Zhi-Hong\*; Zhang, Wei\*. An Integrated Approach to Evaluate Acetamiprid-induced Oxidative Damage to tRNA in Human Cells Based on Oxidized Nucleotide and tRNA Profiling. , , , , 108038.
- 15) Ren, Wen-Jing; Io, Chi-Cheng; Jiang, Rong; Ng, Kei-Fong; Liu, Jiazheng; ; Zhang,
  Wei; Jiang, Zhi-Hong\*; Liu, Yuhong\*; Zhu, Guo-Yuan\*. Di- and Triterpenoids from the
  Rhizomes of and Their Anti-inflammatory Activities.

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- 16) Lu, Li; Zhang, Xin; Kang, Yu; Xiong, Zhuang; Zhang, Kun; Xu, Xuetao\*, \*; Li, Hongguang\*. Novel coumarin derivatives as potential tyrosinase inhibitors: Synthesis, binding analysis and biological evaluation. , 16:104724.
- 17) Meng, Jie-Ru; Liu, Jiazheng; Fu, Lu; Shu, Tong; Yang, Lingzhi; Zhang, Xueji\*; Jiang, Zhi-Hong\*;
  \*. Anti-Entry Activity of Natural Flavonoids Against SARS-CoV-2 by Targeting Spike RBD.
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- 18) Hao, Mengyao; Fu, Rong; Tai, Jun; Tian, Zhenhuan; Yuan, Xia; Chen, Yang; Wang, Mingjin; Jiang, Huimin; Ji, Ming; Lai, Fangfang; Xue, Nina; ; Zhu, Yizhun; Lv, Xiaoxi\*; Chen, Xiaoguang\*; Jin, Jing\*. S1PR1 serves as a viable drug target against pulmonary fibrosis by increasing the integrity of the endothelial barrier of the lung.
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- 19) Zhang, Hui-Xia<sup>#</sup>; Qin, Jian-Feng<sup>#</sup>; Sun, Jian-Feng; Pan, Yu; Yan, Tongmeng; Wang, Cai-Yun;
  ; Zhu, Guo-Yuan; Jiang, Zhi-Hong<sup>\*</sup>; Zhang, Wei<sup>\*</sup>. Selective chemical labeling strategy for oligonucleotides determination: a first application to full-range profiling of transfer RNA modifications.
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- 20) Liu, Jiazheng<sup>#</sup>; Meng, Jieru<sup>#</sup>; Li, Runfeng<sup>#</sup>; Jiang, Haiming; Fu, Lu; Xu, Ting; Zhu, Guo-Yuan; Zhang, Wei; Gao, Jin; Jiang, Zhi-Hong<sup>\*</sup>; Yang, Zi-Feng<sup>\*</sup>; \*. Integrated Network Pharmacology Analysis, Molecular Docking, LC-MS Analysis and Bioassays Revealed the Potential Active Ingredients and Underlying Mechanism of for COVID-19.

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26) Shen, Rong-Sheng; Cao, Dai; Chen, Fei-Long; Wu, Xu-Jia; Gao, Jin;
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27) Chen, Fei-Long; Liu, Dong-Li; Fu, Jing; Fu, Lu; Gao, Jin; , Zhang, Wei, Jiang, Zhi-Hong\*; Zhu, Guo-Yuan\*. Atrachinenynes A–D, four diacetylenic derivatives with unprecedented skeletons from the rhizomes of .

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- 29) Yin, Tianpeng; Yu, Yi; Liu, Qinghua; Mingyue Zhou; Zhu, Guo-Yuan; ; Zhang,
  Wei\*; Jiang, Zhi-Hong\*. 2D NMR-based MatchNat Dereplication Enables Explosive
  Discovery of Novel Diterpenoid Alkaloids. , , , 2169-2178.
- 30) Xu, Ting<sup>#</sup>; Meng, Jieru<sup>#</sup>; Cheng, Wanqing; Liu, Jiazheng; Chu, Junyan; Zhang, Qian; Ma, Nannan;
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- 31) Liu, Qian-Bao<sup>#</sup>; Lu, Jing-Guang<sup>#</sup>; Jiang, Zhi-Hong<sup>\*</sup>; Zhang, Wei; Li, Wen-Jia; Qian, Zheng-Ming;
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- 33) Wang, Yue; Wu, Xuan; Sun, Jianfeng; Wang, Caiyuan; Zhu, Guoyuan; ; Jiang,
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   based on a bismuth oxide surface-decorated nanoporous bismuth electrode.

42) Zheng, Zhiyuan<sup>#</sup>

; Zhang, Wei\*; Jiang, Zhi-Hong\*. Similarity and specificity of traditional Chinese medicine formulas for the management of coronavirus disease 2019 and rheumatoid arthritis based on integrated network pharmacology.

51) Xu, Ting; Zheng, Zhiyuan; Guo, Yong\*;\*. Semisynthesis of novel magnololbased Mannich base derivatives that suppress cancer cells via inducing autophagy.

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- 52) Huang, Qi; Zhang, Hui; , Law, Betty Yuen Kwan; Xiong, Haoming; Zhou, Xiaobo; Xiao, Riping; Qu, Yuan Qing; Mok, Simon Wing Fai; Liu, Liang\*; Wong, Vicent Kam Wai\*. Novel ginsenoside derivative 20(S)-Rh2E2 suppresses tumor growth and metastasis in vivo and in vitro via intervention of cancer cell energy metabolism, , , 621.
- 53) Liu, Meixian; Li, Na; Zhang, Yida; Zheng, Zhiyuan; Zhuo, Yue; Sun, Baoqing; ,
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- 54) Wang, Zhihua; Wu, Wenbo; Guan, Xiangchen; Guo, Shuang; Li, Chaowen; Niu, Ruixue; Gao, Jie; Jiang, Min; ; Leung, Elaine Laihan; Hou, Yuanyuan\*; Jiang, Zhi-Hong\*; Bai,Gang\*. Multiomic analysis revealed 20(s)-protopanaxatriol promotes the binding of P53 and DNA to regulate the antitumor network. , , (6), 1020-1035.
- 55) Jin, Jing \*\*; Xue, Nina \*; Liu, Yuan; Fu, Rong; Wang, Mingjin; Ji, Ming; Lai, Fangfang; Hu, Jinping; Wang, Xiaojian; Xiao, Qiong; Zhang, Xiaoying; Yin, Dali; ; Chen, Liping \*; Rao, Shuan \*. A novel S1P1 modulator IMMH002 ameliorates psoriasis in multiple animal models, , , (2), 276-288.
- 56) Chen, Qi; Liu, Juan; Zhuang, Yuxin; ; Yuan, Qing; Zheng, Silin; Liao, Kangsheng;
  Khan, Md. Asaduzzaman; Wu, Qibiao; Luo, Cheng; Liu, Liang; Wang, Hui \*; Li, Ting \*.
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- 57) Zhou, Xiaobo<sup>#</sup>; Chen, Li<sup>#</sup>; Jiang, Zhi-Hong; Chen, Xiao Yi; Luo, Pei\*; \*.
  Synthesis of 21-Alkylidenes and 21-Alkylol Analogues of Uscharin and Their Effects on Intracellular Calcium in Cardiac Cells. (19), 5512-5517.
- 58) Liu, Xin; Yang, Ji; Yao, Xiaojun; Yang, Xing; Fu, Jing; Liu, Liang; Jiang, Zhi-Hong\*; Zhu, Guo-Yuan\*. Linderalides A-D, Disesquiterpenoids Geranylbenzofuranone Conjugates from Lindera aggregate. (12), 8242-8247.
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- 60) Qin, Hong-Yan \*; Kou, Jia-Xin; Rao, Zhi; Zhang, Guo-Qiang; Wang, Xiao-Hua;
  Wei, Yu-Hui. N-acetyltransferase Activity Assay and Inhibitory Compounds Screening by Using Living Human Hepatoma HepaRG Cell Model.
  (2), 229-237.
- 61) Fan, Dongsheng; Li, Ting; Zheng, Zhiyuan; Zhu, Guo-Yuan; Yao, Xiaojun; Jiang, Zhi-Hong\*;
  \*. Macrolide sesquiterpene pyridine alkaloids from the stems of Tripterygium regelii. (1), 23-33.
- 62) Zhu, Guo-Yuan\*; Yang, Ji; Yao, Xiaojun; Yang, Xing; Fu, Jing; Liu, Xin; ; Liu, Liang; Jiang, Zhi-Hong\*. (+/-)-Sativamides A and B, Two Pairs of Racemic Nor-Lignanamide Enantiomers from the Fruits of Cannabis sativa. (4), 2376-2381.
- 63) Zhou, Xiaobo<sup>#</sup>; Qu, Yuan Qing <sup>#</sup>; Zheng, Zhiyuan; Law, B. Yuen Kwan; Mok, S. Wing Fai; Jiang, Zhi-Hong\*; Wong, V. Kam Wai\*; \*. Novel dauricine derivatives suppress cancer via autophagy-dependent cell death. , 450-460.
- 64) Sun, B.; Liang, Z.; Xie, B. P.; Li, R. T.; Li, L. Z.; Jiang, Z.-H.; ; Chen, Jin Xiang\*.
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- 65) Zhou, Xiao Bo<sup>#</sup>; Chen, Ming<sup>#</sup>; Zheng, Zhi Yuan; Zhu, Guo-Yuan; Jiang, Zhi-Hong<sup>\*</sup>;
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- 66) Yang, S. P.; Zhao, W.; Hu, P. P.; Wu, K. Y.; Jiang, Z.-H.;
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- 68) Qiu, G. H.; Lu, W. Z.; Hu, P. P.; Jiang, Z.-H.;
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- 69) Fan, Dongsheng; Zhou, Shuangyan; Zheng, Zhiyuan; Zhu, Guo-Yuan; Yao, Xiaojun; Yang, Ming Rong; Jiang, Zhi-Hong; \*. New Abietane and Kaurane Type Diterpenoids from the Stems of .
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- 70) Xie, B.-P.<sup>#</sup>; Qiu, G.-H.<sup>#</sup>; Hu, P.-P.; Liang, Z.; Liang, Y.-M.; Sun, B.; ; Jiang, Z.-H.; Chen, Jin-Xiang<sup>\*</sup>. Simultaneous detection of Dengue and Zika virus RNA sequences with a three-dimensional Cu-based zwitterionic metal–organic framework, comparison of single and synchronous fluorescence analysis. , 1133-1140.
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- 75) Parhira, Supawadee; Zhu, Guo-Yuan; Chen, Ming; \*; Jiang, Zhi-Hong\*, Cardenolides from as potent inhibitors of hypoxia-inducible factor-1 transcriptional activity. , 930-936.
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- 77) Li, Jin Xin; Matsumoto, J.; ; Murata, A.; Dohno, C.; Nakatani, Kazuhiko\*. A Ligand That Targets CUG Trinucleotide Repeats. (42), 14881-14889.
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- 80) Fan, Dong Sheng; Parhira, Supawadee; Zhu, Guo-Yuan; Jiang, Zhi-Hong; \*.
  Triterpenoids from the stems of Tripterygium regelii. , 69-73.
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