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副教授

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主要研究領域

■ 體外疾病模型

發展仿人類肺呼吸模型及體外癌症轉移模型，以進行吸入型藥物和抑制癌轉移藥物的開發及研究，以做為個人化精準醫學之應用。

■ 快速篩檢晶片

利用微流體技術在無需複雜儀器下，在同一晶片上進行樣品處理、反應、辨識及判讀。可應用於循環腫瘤細胞之藥效測試、黃疸症狀之判讀、感染疾病抗藥性之分析。

■ 連續蛋白質純化

利用微流體控制系統進行連續式蛋白質純化。能降低純化成本、增加純化效率、以及避免人為污染。可串接在生物反應器後，進行單株抗體、細胞激素、蛋白質藥物、疫苗等純化。

■ 微流體流動化學

利用微流體反應系統進行連續式化學反應及合成。能精準控制反應條件、提升反應效率、減少溶劑使用量、以及提高反應穩定性。可進行奈米顆粒及高單價化學品之合成。

Main Research Interests

■ In Vitro Disease Model

Develop human lung breathing models and *in vitro* cancer metastasis models for the development and research of inhaled drugs and anti-metastatic drugs for the application of personalized and precision medicine.

■ Rapid Diagnosis Chip

Using the microfluidic technology to perform sample processing, reaction, identification and interpretation within the same chip without using complicated instruments. It can be used to test the efficacy of circulating tumor cells, determine the symptoms of jaundice, and analyze the drug resistance of infectious diseases.

■ Continuous Protein Purification

Using the microfluidic control system to continuously purify proteins. It can reduce purification costs, increase purification efficiency, and avoid human contamination. It can also be connected after any bioreactor for purification of monoclonal antibodies, cytokines, protein drugs, and vaccines.

■ Microfluidic-Based Flow Chemistry

Use the microfluidic reaction system for continuous chemical reactions and synthesis. It can precisely control reaction conditions, improve reaction efficiency, reduce solvent usage, and increase reaction stability. It can also be used for the synthesis of nanoparticles and high-value chemicals.

代表作 (Selected Publications)

- Y.-L. Lu, C.-M. Lin, **J.-H. Huang***, Triplicate Dynamic Cell Culture Platform for Enhanced Reproducibility in Anti-Cancer Drug Testing, *ACS Biomaterials Science & Engineering*, **2025**, 11, 1222-1231 (2023 Impact Factor 5.3).
- C.-Y. Liu, Y.-R. Chen, H.-Y. Mu, **J.-H. Huang***, A Dynamic Breathing Lung Chip for Precise Evaluation of Inhaled Drug Efficacy and Airway Epithelial Responses, *ACS Biomaterials Science & Engineering*, **2025**, 11, 682-691 (2023 Impact Factor 5.3).
- H.-Y. Mu, C.-M. Lin, L.-A. Chu, Y.-H. Lin, J. Li, C.-Y. Liu, H.-C. Huang, S.-L. Cheng, T.-Y. Lee, H. M. Lee, H.-M. Chen, Y.-J. Tsai, Y. Chen*, **J.-H. Huang***, Ex Vivo Evaluation of Combination Immunotherapy Using Tumor-Microenvironment-on-Chip. *Advanced Healthcare Materials*. **2024**, 13(2), 2302268 (Cover Image) (2023 Impact Factor 10.0).
- H.-Y. Wu, C.-L. Wu, W. Liao, B.-M. Matsagar, K.-Y. Chang, **J.-H. Huang***, C.-W. Wu*. Continuous and Ultrafast MOF Synthesis Using Microfluidic Nanoarchitectonics. *Journal of Materials Chemistry A*, **2023**, 11, 9427-9435 (Cover Image) (2023 Impact Factor 10.8).
- Y.-H. Sung, C.-L. Wu, **J.-H. Huang***, D.-H. Tsai*. Real-Time Quantifying Microdroplet Synthesis of Metal-Organic Framework Colloids Using Gas-Phase Electrophoresis. *Analytical Chemistry*, **2023**, 95: 4513-4520 (Cover Image) (2023 Impact Factor 6.8).

