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## 工作經驗：

- 2018/08 – 副教授 臺灣大學應用力學所
- 2021/08 – 副教授 臺灣大學重點科技研究學院
- 2021/05 – 副主任 臺灣大學奈米機電系統研究中心
- 2016 – 2018 助理教授 臺灣大學應用力學所
- 2011 – 2016 助理教授 中興大學醫工所
- 2007 – 2011 Postdoctoral, University of Maryland, College Park
- 2018 – Associate Editor on *Micro & Nano Letters*
- 2020 – Editor on *Chemosensors*

## 研究領域：

- 精密機械製程於材料科學與生化檢測應用

### High-Pressure Thermoplastic Device Fabrication

- Scalable Cost effective Flexible
- High pressure resistance > 20 MPa (~ 200 atm)
- Rapid prototyping ( $\geq 100 \mu\text{m}$ )
- Low dead volume

**I. Polymer-Based Microstructure Fabrication**

- Hot Embossing Lithography
- Injection Molding
- Mechanical Milling

**II. Thermal Plastic Bonding Techniques**

- Thermal Bonding
- Solvent Bonding
- Surface modification

**III. Interfaces and Pumps**

- Fluidic manipulation

- 奈米材料於環境監控與醫學應用

**On-Site Hg<sup>2+</sup> Sensing Using Colorimetric Au Nanoparticles on a Paper Device**

*Analytical Chemistry*, 2014, 86, 6843–6849 Highly Cited Paper

**Diagnosis of Tuberculosis on a Paper Device**

ACS Sensors, 2017, 2, 1345–1354

- 簡易式醫療檢測照護系統

### Blood Plasma Separation Using a Fidget-Spinner

**a**

- Capture antibody: Mouse anti-HV-1 p24
- Detection antibody: Mouse anti-HV-1 p24-RFP
- Antigen: Recombinant HV-1 p24
- Blocking buffer: BSA

Procedure: Pore size well pattern on cellulose paper and bake for 15 min under 110 °C. Add 3  $\mu\text{L}$  Mouse anti-HV-1 p24 and bake in 60 °C for 1 min. Add 3  $\mu\text{L}$  BSA and bake in 60 °C for 1 min. Add 3  $\mu\text{L}$  Recombinant HV-1 p24 protein and bake in 60 °C for 1 min. Soak the paper in PBS Tween 20 and shake with vortex mixer for 30 sec. Add 3  $\mu\text{L}$  Mouse anti-HV-1 p24-RFP and bake in 60 °C for 2 min.

**b**

Blank 0.03 0.1 0.3 1 3 10 30

- 微型化分析系統開發

World health organization (WHO)

- Affordable
- Sensitivity
- Specificity
- User-Friendly
- Rapid and Robust
- Equipment-Free
- Delivery to End-Users

**Low-Cost Miniaturized Analytical Systems**

**Silicon**

FET Biosensor  
2015, *Small*, 11, 96-102  
2017, *JACS*, 139, 3045–3051

**Polymer**

Thermoplastic Device  
2015, *Lab Chip*, 15, 4533 - 454  
2019, *Anal Chem*, 91, 1247–1253

**Paper**

Paper-Based Devices  
2017, *ACS Sensors*, 2, 1345–1354  
2019, *Lab Chip*, 19, 598 - 607

## 榮譽獎項：

- 科技部吳大猷先生紀念獎 (2019)
- 科技部未來科技獎 (2020)
- 科技部未來科技突破獎 (2019)
- 科技部優秀年輕學者研究計畫 (2018-2021)

## 主要論文著作：



## Selected Publications

1. Hao Yuan, Jingxuan Tian, Youchuang Chao, Yuh-Shiuan Chien, Ren-Hao Luo, Jun-Yu Guo, Shanshan Li, Yi-Ju Chou, Ho Cheung Shum\*, and Chien-Fu Chen\*, Hand-Powered Microfluidics for Parallel Droplet Digital Loop-Mediated Isothermal Amplification Assays, *ACS Sensors*, 2021, doi.org/10.1021/acssensors.1c00184. **(Cover)**
2. Chung-An Chen, Hao Yuan, Chiao-Wen Chen, Yuh-Shiuan Chien, Wang-Huei Sheng, and Chien-Fu Chen\*, An Electricity- and Instrument-Free Infectious Disease Sensor Based on a 3D Origami Paper-Based Analytical Device, *Lab on a Chip*, 2021, 21, 1908-1915. **(Back Cover and collected in the Lab on a Chip HOT Articles 2021)**
3. Jia-Hui Lin, Tsung-Ting Tsai, Qiang Zeng, Chun-Yen Chang, Jun-Yu Guo, Chi-Jui Lin, and Chien-Fu Chen\*, A Multifunctional Microfluidic Device for Blood Typing and Primary Screening of Blood Diseases, *ACS Sensors*, 2020, 5, 10, 3082–3090. **(Cover)**
4. Tsung-Ting Tsai, Chung-An Chen, Natalie Yi-Ju Ho, Shuan Yang, and Chien-Fu Chen\*, Fluorescent Double-Stranded DNA-Templated Copper Nanoprobes for Rapid Diagnosis of Tuberculosis, *ACS Sensors*, 2019, 4, 2885–2892. **(Cover)**
5. Chung-An Chen, Wen-Shin Yeh, Tsung-Ting Tsai, Yu-De Li, and Chien-Fu Chen\*, Three-Dimensional Origami Paper-Based Device for Portable Immunoassay Applications. *Lab on a Chip*, 2019, 19, 598 - 607. **(Back cover)**
6. Chao-Hsuan Liu, Chung-An Chen, Shi-Jia Chen, Tsung-Ting Tsai, Chin-Chou Chu, Chien-Cheng Chang\*, and Chien-Fu Chen\*, Blood Plasma Separation Using a Fidget-Spinner. *Analytical Chemistry*, 2019, 91, 1247–1253. (Highlighted and reported by the ACS Headline Science, C&EN, Presspac, American Association for the Advancement of Science, IEEE GlobalSpec, and on the journal of Circulation).
7. Tsung-Ting Tsai, Chia-Yu Huang, Chung-An Chen, Shu-Wei Shen, Mei-Chia Wang, Chao-Min Cheng and Chien-Fu Chen\*, Diagnosis of Tuberculosis Using Colorimetric Gold Nanoparticles on a Paper-Based Analytical Device. *ACS Sensors*, 2017, 2, 1345-1354. (Highlighted and reported by the American Association for the Advancement of Science, IEEE GlobalSpec, the American Chemical Society, and the Russian News Agency).