

張耀仁副教授研究室簡介

指導教授：張耀仁(專任教授)

最高學歷：台灣大學 理學院 化學所博士 (PhD)

經歷：1. 中山醫學大學附設醫院 藥物檢測中心負責人

2. 法務部審議委員

E-mail：yzc@csmu.edu.tw

研究室簡介：

本研究室致力於以質譜技術；探討使用血液、唾液、尿液、毛髮等生物檢體，進行毒藥物檢測分析之研究。本研究室重點在濫用藥物及毒藥物之分析方法開發，以發展突破現有檢驗之困難與障礙，並進行跨領域之研究。研究主題、發展方向、研究重點及研發成果，詳述如下說明：

1. 本研究主題包含：

- (1) 濫用藥物之相關研究
- (2) 毒藥物之相關研究。
- (3) 毛髮檢驗。

2. 研究方向：

- (1) 常見濫用藥物之相關研究。
- (2) 新精神影響物質(new psychoactive substances (NPS)) 之相關研究。
- (3) 檳榔、香菸、塑化劑及其代謝物等等生活不良物質之分析。

3. 研究重點：

- (1) 新的前處理方法開發。(血液、唾液、尿液、毛髮等生物檢體)
- (2) 氣相層析與液相層析之質譜方法之開發。
- (3) 真實檢體之探討與人體動力學之評估。

4. 研發成果：

(1) 論文發表

1. **Yan Zin Chang** and Guor Rong Her* (2000) Sheathless Capillary Electrophoresis / Electrospray Mass Spectrometry using a Carbon-Coated Fused Silica Capillary *Anal. Chem* 72, 626-631. (SCI) ☐癌症 ☐老化 ☐幹細胞 ☒藥物研究 ☐其他

2. **Yan Zin Chang**, Yet Ran Chen and Guor Rong Her* (2001) Sheathless

Capillary Electrophoresis / Electrospray Mass Spectrometry using a Carbon-Coated Tapered Fused-Silica Capillary with a BevelAngle ***Anal. Chem.*** 73, 5083-5087 (SCI) ☐癌症☐老化 ☐幹細胞 ☒藥物研究☐其他

3. Yet-Ran Chen, Mei-Chun Tseng, Yan Zin Chang, and Guor-Rong Her* (2003) A Low-Flow CE / Electrospray Ionization MS Interface for Capillary Zone Electrophoresis, Large-Volume Sample Stacking, and Micellar Electrokinetic Chromatography ***Anal. Chem.*** 75, 503-508 (SCI) ☐癌症 ☐老化 ☐幹細胞 ☒藥物研究☐其他

4. Gou-Jen Wang*, Wen-Haw Hsu, Yan-Zin Chang, Hsi-Harng Yang (2004) Centrifugal and Electric Field Forces Dual-Pumping CD-Like Microfluidic Platform for Biomedical Separation, ***Biomedical Microdevices***6:1, 47-53 (SCI) ☐癌症 ☐老化 ☐幹細胞 ☒藥物研究☐其他

5. Gou-Jen Wang*, Wen-Haw Hsu, Yan-Zin Chang (2004) Dead Volume Free Micromachined Electrospray Chip for Mass Spectrometry. ***Biomedical Microdevices*** 6:2 159-164 (SCI)☐癌症☐老化☐幹細胞☒藥物研究☐其他

6. Ya-sha Wu, Keh-liaug Lin, Su-Chin Chen, Yan-Zin Chang* (Corresponding Author) (2005) Hair Analysis for Drugs of Abuse ***CHEMISTRY***, 63, 1, 63-76(國內期刊) ☐癌症☐老化☐幹細胞☒藥物研究☐其他

7. Yan-Zin Chang, Mu-Wen Yang, and Gou-Jen Wang* (2005) A New Mass Spectrometry Electrospray Tip Based on Precise Mechanical Micro Machining ***Analytical and Bioanalytical Chemistry*** 383, 76-82(SCI) ☐癌症 ☐老化☐幹細胞☒藥物研究☐其他

8. Erh-Jung Huang, Cheng-Chung Wu, Hsien-Ping Huang, Jer-Yuh Liu, Chung- Sheng Lin, Yan-Zin Chang, James A. Lin, Jaung-Geng Lin, Li-Mien Chen, Shin-Da Lee, Wei-Wen Kuo and Chih-Yang Huang* (2006) Apoptotic and anti-proliferative effects of 17 β -estradiol and 17 β -estradiol-like compounds in the Hep3B cell line ***Molecular and Cellular Biochemistry*** 290, 1-2, 1-7 (SCI)) ☐癌症☐老化☐幹細胞☒藥物研究☐其他

9. Shun Fa Yang, Shu Chen Chu, Shang Jung Liu, Yi Chen Chen, Yan-Zin Chang, Yih Shou Hsieh.* (2007) Antimetastatic activities of Selaginella tamariscina on lung cancer cells in vitro and in vivo. *Journal of Ethnopharmacology* 110:483-489(SCI) ☐癌症 ☐老化 ☐幹細胞 ☒藥物研究 ☐其他
10. Shou Hsieh Shu, Shun Fa Yang, Shang Jung Liu, Wu Hsien Kuo, Yan Zin Chang, Yih Chen Chu* (2007) In vitro and in vivo antimetastatic effects of Terminalia catappa L. leaves on lung cancer cells. *Food and Chemical Toxicology* 45:1194-1201(SCI)) ☐癌症 ☐老化 ☐幹細胞 ☒藥物研究 ☐其他
11. Ya-Hsueh Wu, Keh-Liang Lin, Su-Chin Chen and Yan-Zin Chang* (Corresponding Author) (2008) Simultaneous quantitative determination of amphetamines, ketamine, opiates and metabolites in human hair by gas chromatography/mass spectrometry. *Rapid Commun. Mass Spectrom.* 22: 887-897 (SCI) ☐癌症 ☐老化 ☐幹細胞 ☒藥物研究 ☐其他
12. Ya-Hsueh Wu, Keh-Liang Lin, Su-Chin Chen and Yan-Zin Chang* (Corresponding Author) (2008) Integration of GC/EI-MS and GC/NCI-MS for simultaneous quantitative of opiates, amphetamines, MDMA, ketamine, and metabolites in human hair. *J Chromatogr B.* 870, 2, 15 192-202 (SCI) ☐癌症 ☐老化 ☐幹細胞 ☒藥物研究 ☐其他
13. Li-Wen Chung, Geng-Jhih Liu, Zu-Guang Li, Yan-Zin Chang, Maw-Rong Lee* (2008) Solvent enhanced microwave assisted derivatization following solid-phase extraction combined with gas chromatography-mass spectrometry for determination of amphetamines in urine, *J. Chromatogr. B* 874(1-2) 115 -118(SCI) ☐癌症 ☐老化 ☐幹細胞 ☒藥物研究 ☐其他
14. Chung-Yu Chen, Chien-Chun Shen, Tzung-Jie Yang, Yan-Zin Chang, Maw-Rong Lee* (2009) High throughput screening various abused drug and metabolites in urine by liquid chromatography heated-electrospray ionization/tandem mass spectrometry, *Talanta*, 77, 1351-1357 (SCI) ☐癌症 ☐老化 ☐幹細胞 ☒藥物研究 ☐其他

15. Mu-Rong Chao, Yan-Zin Chang, Ruey-Hong Wong, Chiung-Wen Hu* (2009) Time course evaluation of N-nitroso dialkylamines induced DNA alkylation and oxidation in liver of mosquito fish *Mutation Research. Fundamental and Molecular Mechanisms of Mutagenesis* 660, 33-39(SCI) ☐癌症☐老化☐幹細胞☒藥物研究☐其他
16. Mei-Ying Chen, Yan-Zin Chang, Fung-Jou Lu, Jian-Lian Chen*; (2010) Determination of phenolic compounds in humic substances of well waters and fertilizers by capillary zone electrophoresis. *Analytical Sciences* 26, 561-567 (SCI) ☐癌症☐老化☐幹細胞☒藥物研究☐其他
17. Pen-Hua Su,Yan-Zin Chang, Jia-Yuh Chen* (2010) Clinical study of a Infant with Ketamine Abused Mother and Quantitative Measurements on Residual Dosage in Hair *Pediatr and Neonatol* 2010; 51(5): 279-284 (SCI) (國科會優良期刊) ☐癌症☐老化☐幹細胞☒藥物研究☐其他
18. Chiung-Wen Hu, Yan-Zin Chang, Hsiao-Wen Wang, and Mu-Rong Chao* (2010) High-Throughput Simultaneous Analysis of Five Urinary Metabolites of Areca Nut and Tobacco Alkaloids by Isotope-Dilution Liquid Chromatography Tandem Mass Spectrometry with On-Line Solid-Phase Extraction. *Cancer Epidemiol Biomarkers Prev* 19:2570-2581 (SCI) ☐癌症☐老化☐幹細胞☒藥物研究☐其他
19. Deng-Jye Yang, Yan-Zin Chang, Shih-Chuan Liu, Mei-Peng Lu, Jau-Tien Lin* (2010) Isolation and Identification of Steroidal Saponins in Taiwanese Rhizoma Paridis Cultivar (Paris formosana Hayata) *Taiwanese Journal of Agricultural Chemistry and Food Science* 48(6) 289-300(國內期刊) ☐癌症☐老化☐幹細胞☒藥物研究☐其他
20. Jau-Tien Lin, Yan-Zin Chang, Mei-Peng Luand, Deng-Jye Yang* (2011) Simultaneous Determination of Furostanol, Pennogenyl and Diosgenyl Glycosides in Taiwanese Rhizoma Paridis (Paris formosana Hayata) by High-Performance Liquid Chromatography with Evaporative Light Scattering Detection *J. Agric. Food Chem.*, 59, 1587 – 1593 (SCI)☐癌症☐老化☐幹細胞

胞■藥物研究□其他

21. Pin Duo Lee, Yuan-Jhe Chang, Keh-Liang Lin, Yan-Zin Chang^{*} (2012) Simultaneous determination of Δ^9 -tetrahydrocannabinol and 11-nor-9-carboxy- Δ^9 -tetrahydrocannabinol in oral fluid using isotope dilution liquid chromatography tandem mass spectrometry *Analytical and Bioanalytical Chemistry* 402: 851 – 859 (SCI) □癌症□老化□幹細胞■藥物研究□其他

22. Yan-Zin Chang, Hsiao-Chun Lin, Shu-Ting Chan, Shu-Lan Yeh^{*} (2012) Quercetin metabolites attenuate the enhancing effect of beta-carotene on DNA damage in Bezo[a]pyrene-exposed A549 cells through down-regulation of cytochrome P1A1/1A2 expression *Food Chemistry* 133, 445–450 (SCI) □癌症□老化□幹細胞■藥物研究□其他

23. Yan-Zin Chang, Wen-Fa Yao , Kuang-Pin Hsiung , Ming-Shen Chiou , Hsing-Ya Li^{*} (2012) Numerical Analysis of an Immunochromatographic Test Strip Reader in Abused Drugs Screening *Journal of Immunoassay and Immunochemistry* 33:180–194 □癌症□老化□幹細胞■藥物研究□其他

24. Pen-Hua Su, Yan-Zin Chang, Chen Yang, Yan-Yan Ng, Jia-Yuh Chen^{*} (2012) Perinatal Effects of Combined Use of Heroin, Methadone, and Amphetamine during Pregnancy and Quantitative Measurement of Metabolites in Hair *Pediatrics and Neonatology* 53, 112-117 (SCI) (國科會優良期刊) □癌症□老化□幹細胞■藥物研究□其他

25. Yi-Chun Ma, Che-Wei Wang, Sih-Hua Hung, Yan-Zin Chang, Chia-Reiy Liu, Guor-Rong Her^{*} (2012) Estimation of the measurement uncertainty in quantitative determination of ketamine and norketamine in urine using a one-point calibration method *J Anal Toxicol* 36:515-22. (SCI) □癌症□老化□幹細胞■藥物研究□其他

26. Deng-Jye Yang, Yan-Zin Chang, Yi-Chen Chen, Shih-Chuan Liu, Chuan-Hsiang Hsu, Jau-Tien Lin (2012) Antioxidant effect and active components of litchi (*Litchi chinensis* Sonn.) flower *Food and Chemical*

Toxicology 50, 3056–3061(SCI) ☐癌症☐老化☐幹細胞☒藥物研究☐其他

27. Pen-Hua Su, Yan-Zin Chang, Shu-Li Wang, Hsin-I Haung, Po-Chin Huang, PhD*, Jia-Yuh Chen* (2012) Exposure to Di(2-Ethylhexyl) Phthalate in Premature Neonates in Neonatal Intensive Care Unit in Taiwan *Pediatric Critical Care Medicine* 13(6):671-677 (SCI) ☐癌症☐老化☐幹細胞☒藥物研究☐其他

28. Mu-Rong Chao, Yan-Zin Chang, and Jian-Lian Chen* (2013) Hydrophilic ionic liquid-passivated CdTe quantum dots for mercury ion detection *Biosensors and Bioelectronics* 42, 397–402 (SCI) ☐癌症☐老化☐幹細胞☒藥物研究☐其他

29. Yuan-Jhe Chang, Keh-Liang Lin, Yan-Zin Chang* (2013) Determination of Di-(2-ethylhexyl)phthalate(DEHP) Metabolites in Human Hair using Liquid Chromatography Tandem Mass Spectrometry *Clinica Chimica Acta* 420, 155-159(SCI) ☐癌症☐老化☐幹細胞☒藥物研究☐其他

30. Yuan-Jhe Chang, Mu-Rong Chao, Su-Chin Chen, Chih-Hong Chen, Yan-Zin Chang* (2014) A high throughput hair analysis method based on microwave-assisted extraction and liquid chromatography tandem mass spectrometry for the simultaneous determination of amphetamines, ketamine, opiates and metabolites *Anal Bioanal Chem* 406, 2445-55(SCI) ☐癌症☐老化☐幹細胞☒藥物研究☐其他

31. Nae-Cherng Yang*, Tuzz-Ying Song, Yan-Zin Chang, Mei-Yau Chen, Miao-Lin Hu* (2015) p-regulation of nicotinamide phosphoribosyltransferase and increase of NAD⁺ levels by glucose restriction extend replicative lifespan of human fibroblast Hs68 cells *Biogerontology* 16, 1, 31-42(SCI) ☐癌症☐老化☐幹細胞☒藥物研究☐其他

32. Chia-Leng Liao, Chien-Min Chen, Yan-Zin Chang, Guang-Yaw Liu, Hui-Chih Hung, Tung-Ying Hsieh, Chih-Li Lin (2015) Pine (*Pinus morrisonicola* Hayata) Needle Extracts Sensitize GBM8901 Human Glioblastoma Cells to Temozolomide by Downregulating Autophagy and

O^6 -Methylguanine-DNA Methyltransferase Expression *J. Agric. Food Chem.*,
62, 10458-10467 (SCI) ☐癌症☐老化☐幹細胞☒藥物研究☐其他

33.Sung-Yuan Hu, Ming-Shun Hsieh, Meng-Yu Lin, Chiann-Yi Hsu, Tzu-Chieh Lin, Chorng-Kuang How, Chen-Yu Wang, Jeffrey Che-Hung Tsai, Yu-Hui Wu, **Yan-Zin Chang*** (2016) Trends of CT utilisation in an emergency department in Taiwan: a 5-year retrospective study *BMJ Open* 2016; 6: e010973.doi:10.1136 (SCI)☐癌症 ☐老化 ☐幹細胞 ☐藥物研究☒其他

5. 人力來源：

- (1) 博士班：6 位
- (2) 碩士班：2 位

6. 所指導的畢業生：約 36 人：

- (1) 博士班的畢業生：3 位
- (2) 碩士班的畢業生：33 位

7. 經費來源：科技部、食品藥物管理署計畫，計畫列表，說明如下：

計 畫 名 稱 (請註明計畫編號)	計畫內擔任 之工作	起迄年月	補助或 委託機構	金額總數
新興濫用藥物於高危險族群之分析 MOHW108-FDA-	主持人	108/01/01 108/12/31	衛福部 食品藥物管理署	1680,000
濫用藥物檢驗之 K 他命難題新解 MOST 106-2113-M-040-003	主持人	106/09/01 107/12/31	科技部	700,000
濫用藥物檢驗之難題新解 MOST 105-2113-M-040-004	主持人	105/08/01 106/07/31	科技部	784,000
口液中濫用藥物現場即時檢驗之開發與實證(3/3)	主持人	104/09/01 105/08/31	科技部	3,020,000
口液中濫用藥物現場即時檢驗之開發與實證(2/3)	主持人	103/09/01 104/08/31	科技部	3,026,600
口液中濫用藥物現場即時檢驗之開發與實證(1/3)	主持人	102/09/01 103/08/31	科技部	4,794,000

多重濫用藥物微量毛髮檢驗之開發	主持人	102/08/01 103/07/31	科技部	756,000
替代療法患者尿液中多重濫用藥物之檢測調查	主持人	102/01/01 102/12/31	衛生署 食品藥物管理局	700,000
特定教育族群之尿液檢驗監測調查研究 (DOH-101-FDA-71004)	主持人	101/01/01 101/12/31	衛生署 食品藥物管理局	730,000
長效型生物檢體質譜代謝體之研究與開發(三) (NSC-100-2113-M-040-002)	主持人	100/08/01 101/07/31	國科會	650,000
替代療法患者尿液、唾液與毛髮檢驗之監測調查研究 (DOH-100-FDA-71013)	主持人	100/01/01 100/12/31	衛生署 食品藥物管理局	872,000
長效型生物檢體質譜代謝體之研究與開發(二) (NSC-99-2113-M-040-001)	主持人	99/08/01 101/07/31	國科會	741,000
濫用藥物毛髮檢驗之實務推展研究(DOH-99-	主持人	99/01/01 -99/12/31	衛生署 食品藥物管理局	950,000
長效型生物檢體質譜代謝體之研究與開發(一) (NSC-98-2113-M-040-002)	主持人	98/08/01 99/07/31	國科會	714,000
濫用藥物毛髮檢驗:初步篩檢與低含量藥物之方法開發(DOH97- NNB-1012)	主持人	97/01/01 -97/12/31	衛生署管制藥品局	920,000

8. 聯絡方式：張耀仁老師：研究大樓七樓 701 室

04-24730022 分機 11699 E-mail：yzc@csmu.edu.tw