

Hsin-Yi Chang, Ph.D.

Assistant Professor

Graduate School of Pharmaceutical Sciences, Kyoto University, Japan

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Introduction

Hsin-Yi Chang studies fundamental biological questions by mass spectrometry-driven proteomics applications including expression proteomics, post-translational modifications (PTMs), protein-protein interactions, and subcellular proteomics. Currently, her research interest is to map the scope of the critical molecules and post-translational modifications for determining the thermogenesis process in white adipocytes. She is also interested in developing new strategies to measure PTM modifier/eraser activity and to determine active ligand-receptor interaction. This leads her research focusing on big data analysis to integrate multi-layer omic data toward the biological interpretation.

Education

2008 - 2013 Ph.D.

Institute of Molecular and Cellular Biology, National Taiwan University, Taiwan.

2006 - 2008 M.S.

Institute of Molecular and Cellular Biology, National Taiwan University, Taiwan.

2002 - 2006 B.S.

Department of Life Science, National Taiwan Normal University, Taiwan.

Research and Professional Experience

2017 - now

Assistant Professor, Graduate School of Pharmaceutical Sciences, Kyoto University, Japan
(with Professor **Yasushi Ishihama**)

2015 - 2017

JSPS Postdoctoral Fellowship for Overseas Researchers, JSPS, Japan
(with Professor **Yasushi Ishihama**)

2013 - 2015

Postdoctoral Fellow, Department of Life Science, NTU
(with Professor **Hsueh-Fen Juan**)

2013

HOPE Fellow, JSPS, Japan

2006

Visiting student, Graduate School of Biological Sciences, Nara Institute of Science and Technology, Nara, Japan
(with Professor **Mori Hirofada**)

Selected Honors and Awards

2017 Postdoctoral Research Abroad Program, MOST, Taiwan

2015 JSPS Postdoctoral Fellowship for Overseas Researchers, JSPS, Japan

2015 Postdoctoral Research Abroad Program, MOST, Taiwan (declined)

2013 Dean Award, College of Life Science, National Taiwan University, Taipei, Taiwan

2013 Selected participants for the 5th HOPE meeting with Nobel Laureates, Tokyo, Japan

2006 Gold Medal for the Entire GPA (2002-2006), Department of Life Science, National Taiwan Normal University, Taipei, Taiwan

2006 First Class Honors-B.S., Department of Life Science, National Taiwan Normal University, Taiwan

Publications

Journal Papers

1. **Hsin-Yi Chang***, Shu-Ping Ye*, Shioh-Lin Pan, Tzu-Ting Kuo, Bia Chia Liu, Yi-Lin Chen, Tsui-Chin Huang#. (2017) Overexpression of miR-194 Reverses HMGA2-driven Signatures in Colorectal Cancer. *Theranostics*. 7(16):3889-3900. *Equal contribution.
2. Chia-Lang Hsu, **Hsin-Yi Chang**, Jen-Yun Chang, Wen-Ming Hsu, Hsuan-Cheng Huang, and Hsueh-Fen Juan. (2016) Unveiling MYCN regulatory networks in neuroblastoma via integrative analysis of heterogeneous genomics data. *Oncotarget*. 7(24): 36293-36310.
3. Kosaku Shinoda, Kana Ohyama, Yutaka Hasegawa, **Hsin-Yi Chang**, Mayu Ogura, Ayaka Sato, Haemin Hong, Takashi Hosono, Louis Z. Sharp, David W. Scheel, Mark Graham, Yasushi Ishihama, and Shingo Kajimura#. (2015) Phosphoproteomics Identifies CK2 as a Negative Regulator of Beige Adipocyte Thermogenesis and Energy Expenditure. *Cell Metabolism*. 22(6):997-1088.
4. **Hsin-Yi Chang**, Ming-Hua Li, Tsui-Chin Huang, Chia-Lang Hsu, Shang-Ru Tsai, Si-Chen Lee#, Hsuan-Cheng Huang#, and Hsueh-Fen Juan#. (2015) Quantitative proteomics reveals middle infrared radiation-interfered networks in breast cancer cells. *Journal of Proteome Research*. 14(2):1250-62.
5. **Hsin-Yi Chang**, Tsui-Chin Huang, Nan-Ning Chen, Hsuan-Cheng Huang#, and Hsueh-Fen Juan. (2014) Combination Therapy Targeting Ectopic ATP Synthase and 26S Proteasome Induces ER Stress in Breast Cancer Cells. *Cell Death & Disease*. 5:e1540.
6. Wei-Jan Huang, Yen-An Tang, Mei-Yu Chen, Ying-Jan Wang, Fu-Han Hu, Tseng-Wei Wang, Shi-Wei Chao, Hui-Wen Chiu, Ya-Ling Yeh, **Hsin-Yi Chang**, Hsueh-Fen Juan, Pinpin Lin, Yi-Ching Wang#. (2014) A histone deacetylase inhibitor YCW1 with antitumor and antimetastasis properties enhances cisplatin activity against non-small cell lung cancer in preclinical studies. *Cancer Letters*. 46(1):84-93.
7. **Hsin-Yi Chang***, Meng-Her Shih*, Hsuan-Cheng Huang, Shang-Ru Tsai, Hsueh-Fen Juan#, and Si-Chen Lee#. (2013) Middle Infrared Radiation Induces G₂/M Cell Cycle Arrest in A549 Lung Cancer Cells. *PLoS One*. 8(1):e54117. *Equal contribution.
8. **Hsin-Yi Chang**, Hsuan-Cheng Huang, Tsui-Chin Huang, Pan-Chyr Yang#, Yi-Ching Wang#, Hsueh-Fen Juan#. (2013) Flow Cytometric Detection of Mitochondrial Membrane Potential. *Bio-protocol*. 3(8):e431.
9. **Hsin-Yi Chang**, Hsuan-Cheng Huang, Tsui-Chin Huang, Pan-Chyr Yang#, Yi-Ching Wang#, Hsueh-Fen Juan#. (2013) Flow Cytometric Detection of Reactive Oxygen Species. *Bio-protocol*. 3(8):e430.

10. **Hsin-Yi Chang**, Hsuan-Cheng Huang, Tsui-Chin Huang, Pan-Chyr Yang#, Yi-Ching Wang#, Hsueh-Fen Juan#. (2012) Ectopic ATP synthase blockade suppresses lung adenocarcinoma growth by activating the unfolded protein response. *Cancer Research*. 72(18):4696-706.
11. Ming-Wei Chang, Jem-Mau Lo, Hsueh-Fen Juan, **Hsin-Yi Chang**, Chun-Yu Chuang#. (2012) Combination of RGD compound and low-dose paclitaxel induces apoptosis in human glioblastoma cells. *PLoS One*. 2012;7(5):e37935.
12. Shang-Ru Tsai, Tsui-Chin Huang, Chia-Ming Liang, **Hsin-Yi Chang**, Yi-Tsung Chang, Hsuan-Cheng Huang, Hsueh-Fen Juan#, Si-Chen Lee#. (2011) The effect of narrow bandwidth infrared radiation on the growth of *Escherichia coli*. *Applied Physics Letters*. 99:163704.
13. Tsui-Chin Huang, **Hsin-Yi Chang**, Cheng-Yu Chen, Pei-Yi Wu, Hsinyu Lee, Yung-Feng Liao, Wen-Ming Hsu#, Hsuan-Cheng Huang#, Hsueh-Fen Juan#. (2011) Silencing of miR-124 induces neuroblastoma cell differentiation, cell cycle arrest and apoptosis through promoting AHR. *FEBS Letters*. 585(22): 3582-3586.
14. Chiung-Mei Chen, Chih-Hsin Lin, Hsueh-Fen Juan, Fen-Ju Hu, Ya-Chin Hsiao, **Hsin-Yi Chang**, Chih-Ying Chao, I-Cheng Chen, Li-Ching Lee, Tsu-Wei Wang, Ya-Tang Chen, Yi-Tsun Chen, Guey-Jen Lee-Chen, Yih-Ru Wu#. (2011) ATP13A2 variability in Taiwanese Parkinson's disease. *American Journal of Medical Genetics Part B: Neuropsychiatric Genetics*. 156B:720-729.
15. Tsui-Chin Huang*, **Hsin-Yi Chang***, Chun-Hua Hsu, Wen-Hung Kuo, King-Jen Chang and Hsueh-Fen Juan#. (2008) Targeting Therapy on Breast Carcinoma by ATP Synthase Inhibitor Aurovertin B. *Journal of Proteome Research*. 7:1433-1444. *Equal contribution.
16. Tsui-Chin Huang, Hsuan-Cheng Huang, Chih-Chin Chang, **Hsin-Yi Chang**, Chern-Han Ou, Chun-Hua Hsu, Shui-Tein Chen, Hsueh-Fen Juan#. (2007) An Apoptosis-related Gene Network Induced by Novel Compound-cRGD in Human Breast Cancer Cells. *FEBS Letters*. 581:3517-3522.

Book (Chapter)

1. **Hsin-Yi Chang** and Hsueh-Fen Juan. (2018) "Transcriptome Analysis: Library Construction" in *A Practical Guide to Cancer Systems Biology*, edited by Hsueh-Fen Juan and Hsuan-Cheng Huang. World Scientific Publishing, Singapore.

2. **Hsin-Yi Chang** and Hsueh-Fen Juan. (2018) "Proteomic Data Analysis: Functional Enrichment" in A Practical Guide to Cancer Systems Biology, edited by Hsueh-Fen Juan and Hsuan-Cheng Huang. World Scientific Publishing, Singapore.
3. Tsui-Chin Huang, **Hsin-Yi Chang**, Hsueh-Fen Juan. (2011) "Discovering drug targets for cancer therapy" in Systems Biology: Applications in cancer-related research, edited by Hsueh-Fen Juan and Hsuan-Cheng Huang. World Scientific Publishing, Singapore.

Patent

阮雪芬、森浩禎、**張心儀**、黃宣誠、黃翠琴、廖俊智。耐受醇類之大腸桿菌之製備方法。中華民國發明專利 I379901。專利核准日期 2012/12/21。

Conference proceeding

1. 新苗 智也, 今見 孝志, **Hsin-Yi Chang**, 杉山 直幸, 石濱 泰。"細胞抽出タンパク質プールを用いたキナーゼの基質モチーフ解析" 138th Annual Meeting of the Pharmaceutical Society of Japan, Kanazawa, Japan, March 25-28.
2. 八尾 一隆, 中園 純菜, 坂本 大, 高橋 知里, **Hsin-Yi Chang**, 杉山 直幸, 石濱 泰。"人工基質ペプチドライブラリを用いた高選択的かつ高感度なキノーム活性計測" 138th Annual Meeting of the Pharmaceutical Society of Japan, Kanazawa, Japan, March 25-28.
3. Michio Funahashi, **Chang HY**, Sugiyama N, Ishihama Y. (2018) "Development of simple and rapid LC/MS/MS methods for host cell protein assay" KBMSS 2018, Kyoto, Japan, Feb. 3.
4. Saki Nambu, Ogasawara M, **Chang HY**, Sugiyama N, Ishihama Y. (2018) "Phosphotyrosine-selective immobilized metal ion affinity chromatography" KBMSS 2018, Kyoto, Japan, Feb. 3.
5. **Hsin-Yi Chang**, Shinoda K, Kajimura S, Ishihama Y. (2017) "Suppression of CK2 Rewires the Metabolism toward Thermogenesis" The 7th Asia Oceania Mass Spectrometry Conference, Biopolis, Singapore, Dec. 11-13.

6. **Hsin-Yi Chang**, Hosono T, Pritikin E, Shinoda K, Kajimura S, Ishihama Y. (2017) "Casein kinase 2 blockade rewires metabolism energetics toward thermogenesis in white adipocytes" ConBio2017, Kobe, Japan, Dec. 6-9.
7. **Hsin-Yi Chang** (2017) "Integrated Omics Reveals Metabolism Rewiring to Turn White Fat Brown" International Conference of Nutrition and Food Safety, Taipei, Taiwan, Dec. 4. (Invited)
8. 新苗智也、**張心儀**、杉山直幸、石濱泰。異なる細胞株由来タンパク質に対するキナーゼのリン酸化モチーフ解析。第 28 回クロマトグラフィー科学会議。京都。2017 年 11 月 15 日～11 月 17 日。
9. 舟橋充央、阿知波弘憲、山本有希子、**Hsin-Yi Chang**、杉山直幸、石濱泰。メートル長 C18 モノリス型シリカキャピラリーカラムと緩勾配溶出を組み合わせた nanoLC/MS/MS によるタンパク質同定システムの最適化。第 28 回クロマトグラフィー科学会議。京都。2017 年 11 月 15 日～11 月 17 日。
10. 南部早紀、小笠原実穂、**Hsin-Yi Chang**、杉山直幸、石濱泰。アフィニティークロマトグラフィーを用いたリン酸化ペプチドと金属イオンの相互作用解析。第 28 回クロマトグラフィー科学会議。京都。2017 年 11 月 15 日～11 月 17 日。
11. 南部 早紀, 小笠原 実穂, **Hsin-Yi Chang**, 杉山 直幸, 石濱 泰。アフィニティークロマトグラフィーを用いたリン酸化ペプチドと金属イオンの相互作用解析。第 24 回クロマトグラフィーシンポジウム, 仙台。2017 年 6 月 15 日～6 月 16 日。
12. 舟橋 充央, 阿知波 弘憲, 山本 有希子, **Hsin-Yi Chang**, 杉山 直幸, 石濱 泰。メートル長 C18 モノリス型シリカキャピラリーカラムと緩勾配溶出を組み合わせた nanoLC/MS/MS によるタンパク質同定システムの最適化。第 24 回クロマトグラフィーシンポジウム, 仙台。2017 年 6 月 15 日～6 月 16 日。
13. 新苗 智也, **Hsin-Yi Chang**, 杉山 直幸, 石濱 泰。異なる細胞株由来タンパク質に対するキナーゼのリン酸化モチーフ解析。第 24 回クロマトグラフィーシンポジウム, 仙台。2017 年 6 月 15 日～6 月 16 日。
14. 舟橋充央、阿知波弘憲、**Hsin-Yi Chang**、杉山直幸、石濱泰。ポリマー被覆モノリス型シリカを用いた逆相系キャピラリーカラムの開発。第 24 回クロマトグラフィーシンポジウム, 仙台。2017 年 6 月 15 日～6 月 16 日。

15. **Hsin-Yi Chang**, Shinoda K, Kajimura S and Ishihama Y. (2017) "Multi-omics analysis deciphers the CK2-subduced protein acetylations in promoting thermogenesis of white adipocytes" (Abstract#R-3), The 1st symposium of Kyoto Biomolecular Mass Spectrometry Society, Kyoto, Japan, Feb. 7.
16. **Hsin-Yi Chang**, Shinoda K, Kajimura S and Ishihama Y. (2016) "Acetylome analysis reveals carbon metabolism as a key factor enhancing thermogenesis in white adipocytes" (Abstract# TO03-003), The 15th HUPO World Congress, Taipei, Taiwan, Sep. 18-21.
17. **Hsin-Yi Chang**, Shinoda K, Kajimura S and Ishihama Y. (2016) "Comprehensive phosphoproteome analysis reveals acetylation-engaged enhancement of thermogenesis in white adipocytes" (Abstract#TP585), The 64th ASMS Conference, San Antonio, USA, Jun. 5-9.
18. **Hsin-Yi Chang**, Huang TC, Chen NN, Huang HC, Juan HF. (2014) "Combination Therapy Targeting Ectopic ATP Synthase and 26S Proteasome Induces ER Stress in Breast Cancer Cells" (Abstract#P19), 2014 TPS Translational and Systems Biology Symposium, Taipei, Taiwan, Nov. 11-12. (Poster award)
19. Li MH, **Hsin-Yi Chang**, Huang TC, Tsai SR, Lee SC, Huang HC, Juan HF. (2014) "Anti-tumor Effects of Middle Infrared Radiation on Breast Cancer Cells" (Abstract#P337) The 29th Joint Annual Conference of Biomedical Sciences, Taipei, Taiwan, March 15-16.
20. **Hsin-Yi Chang**, Huang HC, Huang TC, Yang PC, Wang YC, Juan HF. (2013) "Ectopic ATP synthase: a Therapeutic Marker on Plasma Membrane in Lung Adenocarcinoma" The 18th Biophysics Conference, Taipei, Taiwan, June 27-29. (the First Prize of Poster Award)
21. **Hsin-Yi Chang**, Huang HC, Huang TC, Yang PC, Wang YC, Juan HF. (2013) "Proteome profiling identifies ATP synthase as a therapeutic biomarker on plasma membrane in lung adenocarcinoma." Taiwan Proteomics Society International Conference: Recent Advances in Translational Medicine. Taipei, Taiwan, May 24-25. (the Third Place of Poster Award)

22. **Hsin-Yi Chang**. (2013) "Investigation of Ectopic ATP synthase as a Therapeutic Marker in Lung Adenocarcinoma." The Fifth HOPE Meeting with Nobel Laureates, Tokyo, Japan, February 26 – March 2. (selected HOPE member)
23. Juan HF, **Hsin-Yi Chang**, Huang TC, Yang PC, Wang YC, Huang HC. (2012) "Blocking ectopic ATP synthase suppresses lung adenocarcinoma cell growth by activating unfolded protein response" (Abstract#280) The 13th International Conference on Systems Biology, Toronto, Canada, Aug. 19-23.
24. Tsai HT, **Hsin-Yi Chang**, Chen CS, Hsu CH, Huang HC, Juan HF. (2012) "Revealing Novel Interacting Proteins of ATP Synthase by Human Proteome Microarray." The 27th Joint Annual Conference of Biomedical Sciences, Taipei, Taiwan, March 17-18.
25. **Hsin-Yi Chang**, Huang HC, Juan HF. (2011) "Targeting ecto-ATP synthase induces unfolded protein response, cell cycle arrest and growth inhibition in lung cancer." (Abstract#P1124) The 70th Annual Meeting of the Japanese Cancer Association (JCA), Nagoya, Japan, October 3-5, 2011. (Travel award)
26. Huang TC, **Hsin-Yi Chang**, Chen CY, Wu PY, Lee H, Liao YF, Hsu WM, Huang HC, Juan HF. (2011) "Silencing of miR-124 induces neuroblastoma cell differentiation, cell cycle arrest and apoptosis through promoting AHR" (Abstract#P1159) The 70th Annual Meeting of the Japanese Cancer Association (JCA), Nagoya, Japan, October 3-5, 2011.
27. Chen NN, **Hsin-Yi Chang**, Chen YJ, Huang HC, Juan HF. (2011) "Elucidating the Molecular Mechanism of ATP Synthase Inhibitor Citreoviridin on Anti-Proliferative Activity of Breast Cancer Cells" (Abstract#P206) The 26th Joint Annual Conference of Biomedical Sciences, Taipei, Taiwan, March 19-20.
28. **Hsin-Yi Chang**, Huang TC, Huang HC, Wang YC, Juan HF. (2010) "Ecto-ATP synthase, an efficient therapeutic biomarker in non- small cell lung cancer (NSCLC)" (Abstract#P09) Autumn Camp Symposium of the Taiwan Society for Biochemistry and Molecular Biology (TSBMB), Nantou, Taiwan, November 11-13. (Poster Award)
29. **Hsin-Yi Chang**, Huang TC, Wei YC, Huang HC, Wang YC, Juan HF. (2009) "ATP synthase, the efficient therapeutic biomarker in non-small cell lung cancer (NSCLC)." TPS

International Proteomics Conference and the 5th AOHUPO Membrane Proteomics Initiative (MPI) Workshop, Taipei, Taiwan, June 19-20. (Outstanding oral presentation)

30. **Hsin-Yi Chang**, Huang HC, Huang TC, Mori H, Juan HF. (2008) "Development of 1-Butanol Tolerant Microorganism for Biofuel Production." The Fourth International Meeting on Synthetic Biology (SB4.0), Hong Kong, China, October 10-12. (Travel Award, Oral presentation)
31. **Hsin-Yi Chang**, Huang TC, Hsu CH, Kuo WH, Chang KJ, Juan HF. (2008) "Targeting Therapy for Breast Carcinoma by ATP Synthase Inhibitor Aurovertin B" 7th Symposium on the Frontier Biomedical Sciences, Kaohsiung, Taiwan, June 26-27. (Poster Award)
32. **Hsin-Yi Chang**, Huang HC, Huang TC, Mori H, Juan HF. (2008) "Application for Biofuel Production: Development of 1-Butanol Tolerant Escherichia coli." (Abstract#24) An International Symposium: Biotechnology for Better Crops, Energy and Health-ABRC 10th Anniversary. April 29-May 1.
33. **Hsin-Yi Chang**, Huang HC, Huang TC, Mori H, Juan HF. (2008) Proteomics Analysis of 1-Butanol Tolerant Escherichia coli for Bioenergy Application. (Abstract#O53, oral presentation) The 23th Joint Annual Conference of Biomedical Sciences, Taipei, Taiwan, March 26-27.
34. **Hsin-Yi Chang**, Huang HC, Mori H, Juan HF. (2007) "Screening and proteomics study of butanol-tolerant E. coli" (Abstract#P80) Autumn Camp Symposium of The Taiwan Society for Biochemistry and Molecular Biology (TSBMB), Hsinchu, Taiwan, October 19-20. (Poster Award)
35. Huang TC, **Hsin-Yi Chang**, Juan HF. (2007) "Targeting therapy on breast carcinoma by ATP synthase inhibitor Aurovertin B" (Abstract#P19) Autumn Camp Symposium of The Taiwan Society for Biochemistry and Molecular Biology (TSBMB), Hsinchu, Taiwan, October 19-20.
36. **Hsin-Yi Chang**, Chien KC, Wang YC, and Juan HF. (2005) "Discovery of Biomarkers in Human Lung Cancer by Proteomics Approach" (Abstract#P567) The 20th Joint Annual Conference of Biomedical Sciences, Taipei, Taiwan, March 26-27. (Poster Award)

Travel and Poster awards

- 2014 Poster award from 2014 TPS Translational and Systems Biology Symposium, Taipei, Taiwan.
- 2013 The First Prize in the poster competition award at the 18th Biophysics Conference, Taipei, Taiwan.
- 2013 The Third Place in the poster award at Taiwan Proteomics Society International Conference: Recent Advances in Translational Medicine, Taipei, Taiwan.
- 2011 Travel award from the 70th Annual Meeting of the Japanese Cancer Association (JCA), Nagoya, Japan.
- 2010 Poster award from Autumn Camp Symposium of The Taiwan Society for Biochemistry and Molecular Biology (TSBMB), Nantou, Taiwan.
- 2009 Second place in the oral presentation at the TPS International Proteomics Conference and the 5th AOHUPO Membrane Proteomics Initiative (MPI) Workshop, Taipei, Taiwan.
- 2008 Travel award (oral presentation) from the 4th International Meeting on Synthetic Biology (SB4.0), Hong Kong, China.
- 2008 Poster award from the 5th annual conference of Prof. Lin JY. Foundation, Kaohsiung, Taiwan.
- 2008 Poster award from the poster competition of Institute of Molecular and Cellular Biology, National Taiwan University, Taipei, Taiwan.
- 2007 Poster award from the Autumn Camp Symposium of The Taiwan Society for Biochemistry and Molecular Biology (TSBMB), Hsinchu, Taiwan.
- 2005 Poster award from the 20th Joint Annual Conference of Biomedical Sciences, Taipei, Taiwan.

Teaching Experience

- 2017/05/26 Invited Lecture: Mass Spectrometry Analysis (in English)
Course: ILAS seminar 2017, Kyoto University.
- 2015/11/10 Invited Lecture: JSPS Science Dialogue (in English)
Aichi Prefectural Kariya High School, Aichi, Japan.
- 2014/11/25 Invited Lecture: Personalized Medicine in Cancer Therapy (in English)
Course: Molecular Cancer Biology, TMU.
- 2014/11/17 Invited Lecture: Data Mining in Pathways and Diseases (in English)
Courses: Research Methods in Cancer Biology, TMU.
- 2014/5/16 Invited Lecture: Gene Set Enrichment Analysis (in English)
Courses: Genomics and Systems Biology, TMU.
- 2013/12/2 Invited Lecture: Integration of Genetic, Proteomic, and Metabolic Approaches
in Tumor Cell Metabolism (in English)
Courses: Special Topics in Cancer Metabolism, TMU.
- 2013/11/14 Invited Lecture: 'Bioinformatics'
Courses: General Biology Lab, NTU.
- 2013/5/28 Invited Lecture: 'Discovering drug targets for cancer therapy'
Courses: Cancer Systems Biology, NTU.
- 2008-2012 Teaching Assistant, Department of Life Science, NTU.
Courses: Bioinformatics & Lab
- 2010/10/5 Invited Lecture: 'Metabolism & Photosynthesis'
Courses: General Biology
- 2008-2009 Teaching Assistant, Department of Life Science, NTU.
Courses: Systems Biology
- 2008 Teaching Assistant, School of Pharmacy, NTU.
Courses: General Biology Lab.
- 2006 Teaching Assistant, School of Occupational Therapy, NTU.
Courses: General Biology Lab.