



## **Liu, Hao-Ping**

### **Professor**

**Research Interests:** Comparative Oncology, Cancer Cell Biology

### **Courses Taught:**

- (Undergraduate): Medical Biochemistry & Lab Practicum, Veterinary Virology & Lab Practicum, Introduction to Tumor Cell Biology
- (Graduate): Advanced Biochemistry, Basic Oncology, Molecular Oncology

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## **Educational Background**

**PhD**, Microbiology and Immunology, National Yang Ming University, Taipei, Taiwan

**MSc**, Basic Medical Science, Chang Gung University, Taoyuan, Taiwan

**DVM**, Veterinary Medicine, National Chung Hsing University, Taichung, Taiwan

## **Professional Career**

- **DVM**, National License of Doctor Veterinary Medicine, Taiwan
- **Visiting Research Scholar**, Department of Microbiology, Icahn School of Medicine at Mount Sinai, New York, USA, 2002
- **Postdoctoral Fellow**, Graduate Institute of Basic Medical Science, College of Medicine, Chang Gung University, Taoyuan, Taiwan, 2006/09–2009/07
- **Research Associate**, Molecular Medicine Research Center, Chang Gung University, Taoyuan, Taiwan, 2009/08–2014/01
- **Assistant Professor**, Department of Veterinary Medicine, College of Veterinary Medicine, National Chung Hsing University, Taichung, Taiwan, 2014/02–2019/07
- **Associate Professor**, Department of Veterinary Medicine, College of Veterinary Medicine, National Chung Hsing University, Taichung, Taiwan, 2019/07–2025/02
- **Division Director of Teaching & Promotion**, Biotechnology & Development Center, National Chung Hsing University, Taichung, Taiwan, 2023/08–

## **Honors**

- Award for Distinguished Dissertation in Biomedical Science, Tian-De Lee Medical and Pharm. Foundation, Taiwan, 2008
- Poster Award, TPS International Proteomics Conference and 5<sup>th</sup> AOHUPO MPI Workshop, Taipei, Taiwan, 2009
- The Pride of National Chung Hsing University, Taiwan, 2016
- Distinguished Teaching Award, National Chung Hsing University, Taiwan, 2017
- Elite Veterinary Award for Outstanding Teaching and Research, Dr. Robert C. T. Lee Foundation, Taiwan, 2017
- Distinguished Faculty, National Chung Hsing University, Taiwan, 2018–2020
- Distinguished Faculty, National Chung Hsing University, Taiwan, 2020–2022

## **Research Interests**

- Molecular mechanisms underlying cancer progression
- Interactions between tumor, virus, and tumor microenvironment
- Discovery and application of disease biomarkers

## **Publications**

## 2002–2014

1. K-P Chow, H-C Lu, H-F Chou, **H-P Liu**, S-L Hsieh, Y-S Chang, K-B Choo\*. Induction of chemosensitivity in nasopharyngeal carcinoma cells using a human papillomavirus regulatory sequence and the thymidine kinase gene. *Journal of Biomedical Science*, 2002 Jan-Feb, 9(1): 41–46. [SCI]
2. Y-H Hsieh<sup>§</sup>, **H-P Liu**<sup>§</sup>, S-J Lo, Y-S Chang\*. Tumor regression by expression of high physiological levels of EBV latent membrane protein 1. *Cancer Biology & Therapy*, 2006 Mar, 5(3): 310–317. [SCI]
3. **H-P Liu**, C-C Wu, Y-S Chang\*. PRA1 promotes the intracellular trafficking and NF-κB signaling of EBV latent membrane protein 1. *EMBO Journal*, 2006 Sep, 25(17): 4120–4130. [SCI]
4. C-C Wu, H-C Chen, S-J Chen, **H-P Liu**, Y-Y Hsieh, C-J Yu, R-P Tang, L-L Hsieh, J-S Yu\*, Y-S Chang. Identification of collapsin response mediator protein-2 as a potential marker of colorectal carcinoma by comparative analysis of cancer cell secretomes. *Proteomics*, 2008 Jan, 8(2): 316–332. [SCI]
5. L-C Chen, **H-P Liu**, H-P Li, C Hsueh, J-S Yu, C-L Liang, Y-S Chang\*. Thymidine phosphorylase mRNA stability and protein levels are increased through ERK-mediated cytoplasmic accumulation of hnRNP K in nasopharyngeal carcinoma cells. *Oncogene*, 2009 Apr, 28(17): 1904–1915. [SCI]
6. Y-J Lu, C-S Wu, H-P Li\*, **H-P Liu**, C-Y Lu, Y-W Leu, C-S Wang, L-C Chen, K-H Lin, Y-S Chang\*. Aberrant methylation impairs *low density lipoprotein receptor-related protein 1B (LRP1B)* tumor suppressor function in gastric cancer. *Genes Chromosomes & Cancer*, 2010 May, 49(5): 412–424. [SCI]
7. C-C Wu, C-W Hsu, C-D Chen, C-J Yu, K-P Chang, D-I Tai, **H-P Liu**, W-H Su, Y-S Chang, J-S Yu\*. Candidate serological biomarkers for cancer identified from the secretomes of 23 cancer cell lines and the human protein atlas. *Molecular & Cellular Proteomics*, 2010 Jun, 9(6): 1100–1117. [SCI]
8. C-S Wu, Y-J Lu, H-P Li\*, C Hsueh, C-Y Lu, Y-W Leu, **H-P Liu**, K-H Lin, T-H Huang, Y-S Chang\*. *Glutamate receptor, ionotropic, kainate 2* silencing by DNA hypermethylation possesses tumor suppressor function in gastric cancer. *International Journal of Cancer*, 2010 Jun, 126(11): 2542–2552. [SCI]
9. **H-P Liu**, P-J Chung\*, C-L Liang, Y-S Chang\*. The MYND domain-containing protein BRAM1 inhibits lymphotoxin beta receptor-mediated signaling through affecting receptor oligomerization. *Cellular Signaling*, 2011 Jan, 23(1): 80–88. [SCI]
10. **H-P Liu**, C-C Wu, H-Y Kao, Y-C Huang, Y Liang, C-C Chen, J-S Yu, Y-S Chang\*. Proteome-wide dysregulation by PRA1 depletion delineates a role of PRA1 in lipid transport and cell migration. *Molecular & Cellular Proteomics*, 2011 Mar, 10(3): M900641MCP200. [SCI]
11. Y-T Chang, C-C Wu\*, Y-M Shyr, T-C Chen, T-L Hwang, T-S Yeh, K-P Chang, **H-P Liu**, Y-L Liu, M-H Tsai, Y-S Chang, J-S Yu\*. Secretome-based identification of ULBP2 as a novel serum marker for pancreatic cancer detection. *PLoS One*, 2011 May, 6(5): e20029. [SCI]
12. **H-P Liu**, C-C Chen, C-C Wu, Y-C Huang, S-C Liu, Y Liang, K-P Chang, Y-S Chang\*. Epstein–Barr virus-encoded LMP1 interacts with FGD4 to activate Cdc42 and thereby promote migration of nasopharyngeal carcinoma cells. *PLoS Pathogens*, 2012 May, 8(5): e1002690. [SCI]
13. C-I Wang, K-Y Chien, C-L Wang, **H-P Liu**, C-C Cheng, Y-S Chang, J-S Yu, C-J Yu\*. Quantitative proteomics reveals regulation of KPNA2 and its potential novel cargo proteins in non-small cell lung cancer. *Molecular & Cellular Proteomics*, 2012 Nov, 11(11): 1105–1122. [SCI]
14. C-C Chen<sup>§</sup>, **H-P Liu**<sup>§</sup> (§equal contribution), M Chao, Y Liang, N-M Tsang, H-Y Huang, C-C Wu, Y-S Chang\*. NF-κB-mediated transcriptional upregulation of TNFAIP2 by the Epstein–Barr virus oncoprotein, LMP1, promotes cell motility in nasopharyngeal carcinoma. *Oncogene*, 2014 Jul, 33(28): 3648–59. [SCI]
15. C-C Wu\*, Y-T Chang, K-P Chang, Y-L Liu, **H-P Liu**, I-L Lee, J-S Yu, W-F Chiang\*. Salivary auto-antibodies as noninvasive diagnostic markers of oral cavity squamous cell carcinoma. *Cancer Epidemiology, Biomarkers & Prevention*, 2014 Aug, 23(8): 1569–78. [SCI]

## 2015– present

16. T-S Wu, L-C Wang, S-C Liu, T-Y Hsu, C-Y Lin, G-J Feng, J-M Chen, **H-P Liu**, I-C Chung, T-C Yen, Y-S Chang, S-K Liao, C Chang\*, KPN Chow\*. EBV oncogene N-LMP1 induces CD4 T-cell-mediated angiogenic blockade in the murine tumor model. *The Journal of Immunology*, 2015 May, 194(9): 4577–87. [SCI]
17. C-C Wu, H-W Chu, C-W Hsu, K-P Chang\*, **H-P Liu**\*. Saliva proteome profiling reveals potential salivary biomarkers for detection of oral cavity squamous cell carcinoma. *Proteomics*, 2015 Oct, 15(19): 3394–3404. [SCI] ("Featured Articles" in the issue)
18. S-W Huang, **H-P Liu**, J-K Chen, Y-W Shien, M-L Wong, C-Y Wang\*. Dual ATPase and GTPase activity of the replication-associated protein (Rep) of beak feather disease virus. *Virus Research*, 2016 Feb, 213: 149–161. [SCI]
19. R-L Kuo, Z-H Li, L-H Li, K-M Lee, E-H Tam, H-M Liu, **H-P Liu**, S-R Shih, C-C Wu\*. Interactome analysis of

- the NS1 protein encoded by influenza A H1N1 virus reveals a positive regulatory role of host protein PRP19 in viral replication. *Journal of Proteome Research*, 2016 May, 15(5): 1639–48. [SCI]
20. H-I Huang, Y-Y Chang, J-Y Lin, R-L Kuo, **H-P Liu**, S-R Shih, C-C Wu\*. Interactome analysis of the EV71 5' untranslated region in differentiated neuronal cells SH-SY5Y and regulatory role of FBP3 in viral replication. *Proteomics*, 2016 Sep, 16(17): 2351–62. [SCI]
  21. C-H Chiang, C-C Wu, L-Y Lee, Y-C Li, **H-P Liu**, C-W Hsu, Y-C Lu, J-T Chang, A-J Cheng\*. Proteomics analysis reveals involvement of Krt17 in areca nut-induced oral carcinogenesis. *Journal of Proteome Research*, 2016 Sep, 15(9): 2981–2997. [SCI]
  22. Y-J Lee, M-Y Lee, A Ruan, C-K Chen, **H-P Liu**, C-J Wang, W-R Chao\*, C-P Han\*. Multipoint Kras oncogene mutations potentially indicate mucinous carcinoma on the entire spectrum of mucinous ovarian neoplasms. *Oncotarget*, 2016 Dec, 7(50): 82097–82103. [SCI]
  23. S Kake, S Tsuj, S Enjoji, S Hanasaki, H Hayase, R Yabe, Y Tanaka, T Nakagawa, **H-P Liu**, S-C Chang, T Usui, T Ohama\*, K Sato. The role of SET/1 I2PP2A in canine mammary tumors. *Scientific Reports*, 2017 Jun, 7(1): 4279. [SCI]
  24. R-L Kuo, C-J Chen, E-H Tam, C-G Huang, L-H Li, Z-H Li, P-C Su, **H-P Liu**, C-C Wu\*. Interactome analysis of NS1 protein encoded by influenza A H7N9 virus reveals an inhibitory role of NS1 in host mRNA maturation. *Journal of Proteome Research*, 2018 Apr, 7(4): 1474–1484. [SCI]
  25. T-H Hsu, **H-P Liu**, C-Y Chin, C Wang, W-Z Zhu, B-L Wu, Y-C Chang\*. Detection, sequence analysis, and antibody prevalence of porcine deltacoronavirus in Taiwan. *Archive of Virology*, 2018 Nov, 163(11): 3113–3117. [SCI]
  26. C-C Wu, S-C Chang, G-Y Zeng, H-W Chu, Y Huang, **H-P Liu**\*. Proteome analyses reveal positive association of COL2A1, MPO, TYMS, and IGFBP5 with canine mammary gland malignancy. *Proteomics–Clinical Applications*, 2019 Jul, 13(4): e1800151. [SCI]
  27. G-R Liao, Y-Y Tseng, J-Y Tseng, F-Y Lin, Y Yamada, **H-P Liu**, C-Y Kuan, W-L Hsu\*. Adenosine deaminase acting on RNA 1 associates with Orf virus OV20.0 and enhances viral replication. *Journal of Virology*, 2019 Mar, 93(7): 10.1128/jvi.01912-18. [SCI]
  28. H-W Chu, K-P Chang, C-W Hsu, I-Y Chang, **H-P Liu**, Y-T Chen, C-C Wu\*. Identification of salivary biomarkers for oral cancer detection with untargeted and targeted quantitative proteomics approaches. *Molecular & Cellular Proteomics*, 2019 Sep, 18(9): 1796–1806. [SCI]
  29. C-W Hsu, K-P Chang, Y Huang, **H-P Liu**, P-C Hsueh, P-W Gu, W-C Yen, C-C Wu\*. Proteomic profiling of paired interstitial fluids reveals dysregulated pathways and salivary NID1 as a biomarker of oral cavity squamous cell carcinoma. *Molecular & Cellular Proteomics*, 2019 Oct, 18(10): 1939–1949. [SCI]
  30. S-C Chang, SH-C Yuan, C-Y Li, H-M Chang, H-C Wang, Y-A Pan, P-C Hsueh, C-C Wu, Y Yang, **H-P Liu**\*. Significant association of serum autoantibodies to TYMS, HAPLN1 and IGFBP5 with early stage canine malignant mammary tumours. *Veterinary and Comparative Oncology*, 2021 Mar, 19(1): 172-182. [SCI]
  31. G-R Liao, Y-Y Tseng, C-Y Tseng, Y-P Huang, C-H Tsai, **H-P Liu**, W-L Hsu\*. K160 in the RNA-binding domain of the orf virus virulence factor OV20.0 is critical for its functions in counteracting host antiviral defense. *FEBS Letter*, 2021 Jun, 595(12): 1721-1733. [SCI]
  32. SH-C Yuan, S-C Chang, Y Huang, **H-P Liu**\*. Serum level of tumor-overexpressed AGR2 is significantly associated with unfavorable prognosis of canine malignant mammary tumors. *Animals*, 2021 Oct, 11(10): 2923. [SCI]
  33. R-L Kuo, E-H Tam, C-H Woung, C-M Hung, **H-P Liu**, HM Liu, C-C Wu\*. Interactome profiling of N-terminus-truncated NS1 protein of influenza A virus reveals role of 14-3-3 $\gamma$  in virus replication. *Pathogens*, 2022 Jun, 11(7): 733. [SCI]
  34. SH-C Yuan, S-C Chang, P-Y Chou, Y Yang, **H-P Liu**\*. The implication of serum autoantibodies in prognosis of canine mammary tumors. *Animals*, 2022 Sep, 12(18): 2463. [SCI]
  35. P-C Hsueh, K-P Chang, **H-P Liu**, W-F Chiang, X-Y Chan, C-M Hung, LJ Chu, C-C Wu\*. Development of a salivary autoantibody biomarker panel for diagnosis of oral cavity squamous cell carcinoma. *Frontiers in Oncology*, 2022 Oct, 12: 968570. [SCI]
  36. H-W Chu, K-P Chang, W-C Yen, **H-P Liu**, X-Y Chan, C-R Liu, C-M Hung, C-C Wu\*. Identification of salivary autoantibodies as biomarkers of oral cancer with immunoglobulin A enrichment combined with affinity mass spectrometry. *Proteomics*, 2023 May, 23(9): 2200321. [SCI]
  37. Y-C Chang<sup>§</sup> **H-P Liu**<sup>§</sup>, H-L Chuang<sup>§</sup>, J-W Liao, P-L Kao, H-L Chan, T-H Chen, Y-C Wang\*. Feline mammary carcinoma-derived extracellular vesicle promotes liver metastasis via sphingosine kinase-1-mediated premetastatic niche formation. *Laboratory Animal Research*, 2023 Nov, 39 (1): 27. [SCI]

38. C-H Lin, H-MH Tam, C-Y Yang, F-C Hsieh, J-L Wang, C-C Yang, H-W Hsu, **H-P Liu**<sup>\*</sup>, H-Y Wu<sup>\*</sup>. Evolution of the coronavirus spike protein in the full-length genome and defective viral genome under diverse selection pressures. *Journal of General Virology*, 2023 Nov, 104(11): 001920. [SCI]
39. SH-C Yuan<sup>§</sup>, C-C Wu<sup>§</sup>, Y-C Wang, X-Y Chan, H-W Chu, Y Yang, **H-P Liu**<sup>\*</sup>. AGR2-mediated unconventional secretion of 14-3-3 $\epsilon$  and  $\alpha$ -actinin-4, responsive to ER stress and autophagy, drives chemotaxis in canine mammary tumor cells. *Cellular and Molecular Biology Letters*, 2024 May 31, 29(1): 84. [SCI]
40. X-Y Chan<sup>§</sup>, K-P Chang<sup>§</sup>, C-Y Yang, C-R Liu, C-M Hung, C-C Huang, **H-P Liu**, C-C Wu<sup>\*</sup>. Upregulation of ENAH by a PI3K/AKT/ $\beta$ -catenin cascade promotes oral cancer cell migration and growth via an ITGB5/Src axis. *Cellular and Molecular Biology Letters*, 2024 Nov 31, 29(1): 136. [SCI]
41. C-C Wu, C-Y Chang, P-Y Chou, X-Y Chan, C-C Huang, Y Yang, **H-P Liu**<sup>\*</sup>. Multiplexed immunoassay for a serum autoantibody biomarker panel in diagnostic and prognostic prediction of canine mammary tumors. *Veterinary Quarterly*, 2024 Dec, 2025 45(1):1–12. [SCI]

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