



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
- **Postdoctoral 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, 2019/07–2025/01
- **Director of Teaching & Promotion Division**, Biotechnology Center, National Chung Hsing University, Taichung, Taiwan, 2023/08–
- **Adjunct Professor**, Doctoral Program in Microbial Genomics (DPMG), National Chung Hsing University and Academia Sinica, Taiwan, 2024/02–
- **Adjunct Professor**, Doctoral Program in Tissue Engineering and Regenerative Medicine (DPTerm), National Chung Hsing University and National Health Research Institutes (NHRI), Taiwan, 2024/02–

Honors

- Award for Distinguished Dissertation in Biomedical Science, Tian-De Lee Medical and Pharm. Foundation, Taiwan, 2008
- Poster Award, TPS International Proteomics Conference and 5th 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
- Distinguished Professor, National Chung Hsing University, Taiwan, 2026–2028

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[§], **H-P Liu**[§], 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- κ B 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[§], **H-P Liu**[§], M Chao, Y Liang, N-M Tsang, H-Y Huang, C-C Wu, Y-S Chang*. NF- κ B-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 γ 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[§] **H-P Liu**[§], H-L Chuang[§], 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***, H-Y Wu*. 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[§], C-C Wu[§], Y-C Wang, X-Y Chan, H-W Chu, Y Yang, **H-P Liu***. AGR2-mediated unconventional secretion of 14-3-3 ϵ and α -actinin-4, responsive to ER stress and autophagy, drives chemotaxis in canine mammary tumor cells. *Cellular and Molecular Biology Letters*, 2024 May, 29(1): 84. [SCI]
 40. X-Y Chan[§], K-P Chang[§], C-Y Yang, C-R Liu, C-M Hung, C-C Huang, **H-P Liu**, C-C Wu*. Upregulation of ENAH by a PI3K/AKT/ β -catenin cascade promotes oral cancer cell migration and growth via an ITGB5/Src axis. *Cellular and Molecular Biology Letters*, 2024 Nov, 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***. Multiplexed immunoassay for a serum autoantibody biomarker panel in diagnostic and prognostic prediction of canine mammary tumors. *Veterinary Quarterly*, 2025 Dec, 45(1):1–12. [SCI]
 42. Y Yamada, Y-C Wang, **H-P Liu**, GR Gerongano, C-Y Tseng, S-C Liu, G-R Liao, C-C Chang, J-W Liao, M-L Wang, Y-Y Chang, F-Y Lin, W-L Hsu*. Development of attenuated Orf virus as a safe oncolytic viral vector for nasopharyngeal carcinoma treatment. *Virology Journal*, 2025 Feb, 22(1): 50. [SCI]
 43. G-S Chen, H-Y Chiou, Y-C Chang, **H-P Liu**, Y-I Pan, M-Y Chan, T-C Liu, M-Y Chia, C Huang, H-W Chang, JP-W Chan, C-Y Chang*. Molecular and histological identification of bovine papillomavirus 1, 2, and a novel genotype in cutaneous papillomas of dairy cattle in Taiwan. *Transboundary and Emerging Diseases*, 2025 Jun, 2025: 5586786. [SCI]
 44. C-R Liu, C-Y Yang, K-P Chang, X-Y Chan, C-M Hung, C-Y Yang, K-M Lai, **H-P Liu***, C-C Wu*. LCP1 upregulation via EGFR signaling promotes oral cancer progression through the JAK2/STAT3/IL-1 β axis. *Cancer Cell International*, 2025 Oct, 25(1): 329. [SCI]
 45. B Lan[§], C-Y Chang[§], S-W Liu, C-C Wu, K-M Lai, **H-P Liu***. Machine learning-assisted detection of canine mammary tumors using serum autoantibody signatures. *Veterinary Quarterly*, 2026 Dec, 46(1): 2617470. [SCI]
 46. P-L Kao[§], **H-P Liu**[§], H-L Chuang[§], W-L Hsu, Y-C Chang, J-W Liao, H-L Chan, Y-T Huang, Y-F Chen, B-Y Lin, T-H Chen, Y-C Wang*. Autologous extracellular vesicle membrane-liposome nanovesicles for targeted paclitaxel delivery in feline mammary carcinoma. Submitted.

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