

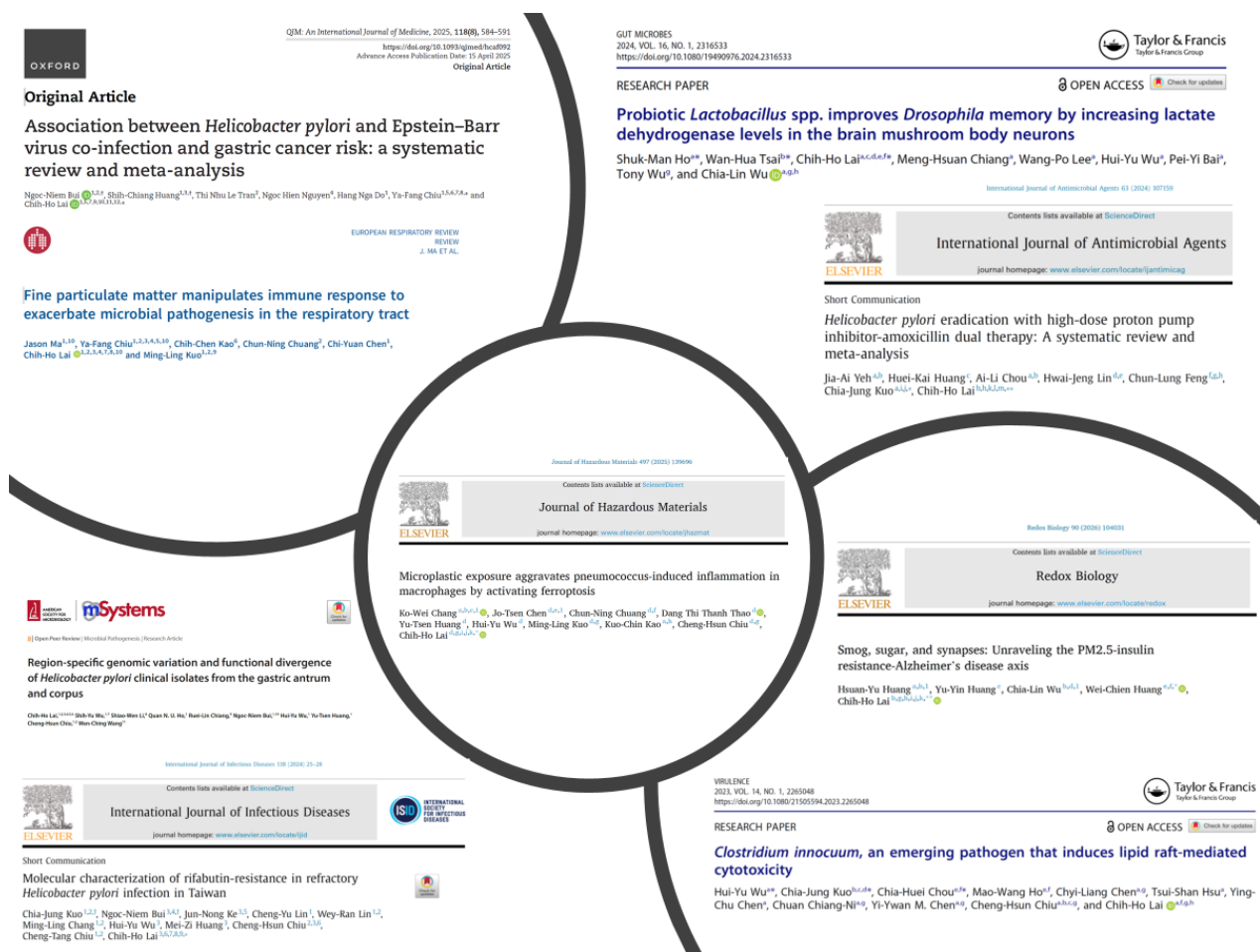
## Research Highlights of Dr. Chih-Ho Lai

The research program led by Professor Chih-Ho Lai focuses on the sophisticated interplay between microbial pathogenesis and host innate immunity. By integrating advanced molecular biology with multi-omics platforms, the laboratory investigates how bacterial and viral virulence factors subvert host defenses to drive disease progression. Furthermore, the laboratory pioneeringly examines how environmental pollutants, including PM2.5 and microplastics, act as manipulators of the gut microbiota, exacerbating systemic inflammation and host vulnerability to microbial infections. By examining how these factors collectively disrupt host immunity and microbiota homeostasis, the team provides critical insights into infectious disease dynamics, driving the discovery of next-generation therapeutic and preventive interventions.

### Selected publication (Recent 3 years)

- Huang HY, Huang YY, Wu CL, Huang WC, **Lai CH\***. Smog, sugar, and synapses: Unraveling the PM2.5-insulin resistance-Alzheimer's disease axis. *Redox Biology*. 2026;90:104031.
- Lien HM, Wang YY, Li SW, Lin HJ, Wu HY, Huang YT, Chen CY, Chen CC, Chiu CH, **Lai CH\***. *Anisomeles indica* enriched with ovatodiolide protects against aspirin-induced gastric ulcers through gut microbiota modulation. *Biomedical Journal*. 2025;49(2):100893.
- **Lai CH\***, Wu SY, Li SW, Ho QNU, Chiang RL, Bui NN, Wu HY, Huang YT, Chiu CH, Wang WC. Region-specific genomic variation and functional divergence of *Helicobacter pylori* clinical isolates from the gastric antrum and corpus. *mSystems*. 2025;22;10(10):e0102925.
- Chang KW, Chen JT, Chuang CN, Thao DTT, Huang YT, Wu HY, Kuo ML, Kao KC, Chiu CH, **Lai CH\***. Microplastic exposure aggravates pneumococcus-induced inflammation in macrophages by activating ferroptosis. *Journal of Hazardous Materials*. 2025;497:139696.
- Bui NN, Huang SC, Le Tran TN, Nguyen NH, Do HN, Chiu YF, **Lai CH\***. Association between *Helicobacter pylori* and Epstein-Barr virus co-infection and gastric cancer risk: A systematic review and meta-analysis. *QJM An International Journal of Medicine*. 2025;118(8):584-591.
- Que AT, Tran AD, Trang THN, Tran TNL, Bui NN, **Lai CH\***. Epidemiology and antimicrobial resistance patterns of urinary tract infection: insights and strategies from a 5-year serial cross-sectional study in Vietnam. *Ther Adv Infect Dis*. 2025;12:20499361251315346.
- Liao WC, Chou CH, Ho MW, Chen JT, Chou SL, Huang YT, Bui NN, Wu HY, Lee CF, Huang WC, **Lai CH\***. Cigarette smoke compromises macrophage innate sensing in response to pneumococcal infection. *J Microbiol Immunol Infect*. 2025;58(1):120-127.
- Yeh JA, Huang HK, Chou AL, Lin HJ, Feng CL, Kuo CJ, **Lai CH\***. *Helicobacter pylori* eradication with high-dose proton pump inhibitor-amoxicillin dual therapy: A systematic review and meta-analysis. *Int J Antimicrob Agents*. 2024;63(6):107159.
- Ma J<sup>†</sup>, Chiu YF<sup>†</sup>, Kao CC, Chuang CN, Chen CY, **Lai CH<sup>†</sup>**, Kuo ML\*. Fine particulate matter manipulates immune response to exacerbate microbial pathogenesis in the respiratory tract. *Eur Respir Rev*. 2024;33(173):230259. (†equal contribution)
- Chang YF, Huang YP, Chou CH, Ho MW, Lin HJ, Chen CY, Wu HY, Lai YR, Lee YH, Chiu CH, **Lai CH\***. RAGE participates in the intracellular transport of *Campylobacter jejuni* cytolethal distending toxin. *J Microbiol Immunol Infect*. 2024;57(5):709-719.
- Ho SM<sup>†</sup>, Tsai WH<sup>†</sup>, **Lai CH<sup>†</sup>**, Chiang MH, Lee WP, Wu HY, Bai PY, Wu T, Wu CL\*. Probiotic *Lactobacillus* spp. improves *Drosophila* memory by increasing lactate dehydrogenase levels in the brain mushroom body neurons. *Gut Microbes*. 2024;16(1):2316533. (†equal contribution)
- Li YJ, Chen CY, Kuo YS, Huang YW, Kuo RL, Chang LK, Yang JH, **Lai CH**, Shih SR, Chiu YF\*. OTUB1 contributes to the stability and function of influenza A virus NS2. *PLoS Pathog*. 2024;20(5):e1012279.

- Kuo CJ, Bui NN, Ke JN, Lin CY, Lin WR, Chang ML, Wu HY, Huang MZ, Chiu CH, Chiu CT, **Lai CH\***. Molecular characterization of rifabutin-resistance in refractory *Helicobacter pylori* infection in Taiwan. *Int J Infect Dis*. 2023;138:25-28.
- Bui NN, Li CY, Wang LY, Chen YA, Kao WH, Chou LF, Hsieh JT, Lin H, **Lai CH\***. *Clostridium scindens* metabolites trigger prostate cancer progression through androgen receptor signaling. *J Microbiol Immunol Infect*. 2023;56(2):246-256.
- Wu HY, Kuo CJ, Chou CH, Ho MW, Chen CL, Hsu TS, Chen YC, Chiang-Ni C, Chen YM, Chiu CH, **Lai CH\***. *Clostridium innocuum*, an emerging pathogen that induces lipid raft-mediated cytotoxicity. *Virulence*. 2023;14(1):2265048.
- Kuo CJ, Ke JN, Kuo T, Lin CY, Hsieh SY, Chiu YF, Wu HY, Bui NN, Chiu CH, Chiu CT, **Lai CH\***. Multiple amino acid substitutions in penicillin-binding protein-1A confer amoxicillin resistance in refractory *Helicobacter pylori* infection. *J Microbiol Immunol Infect*. 2023;56(1):40-47.



## Honors, awards, and invited speeches

- **Thi Thanh Thao Dang:** Received Travel Grant, Oral Presentation: Environmental polystyrene nanoplastics exacerbate *Helicobacter pylori*-driven inflammation and epithelial-mesenchymal transition in gastric epithelial cells. International Symposium on *Helicobacter* and Upper Gastrointestinal Diseases (HUG 2026), March 19-21, Seoul, Korea.
- **Ngoc-Niem Bui:** Received Travel Grant, Poster Presentation: Co-infection of *Helicobacter pylori* promotes Epstein-Barr virus reactivation in gastric epithelial cells. International Symposium on *Helicobacter* and Upper Gastrointestinal Diseases (HUG 2026), March 19-21,

Seoul, Korea.

- **Yen-Hsuan Li:** International Exchange Student at the National University of Singapore (January 2026–June 2026).
- **Pei-Yi Tsai:** International Exchange Student at the National University of Singapore (January 2026–June 2026).
- **Chih-Ho Lai:** Invited Speech: Antrocin sensitizes prostate cancer cells to radiotherapy," October 10-11, 2025, Peking University, Peking, China.
- **Prof. Chia-Lin Wu and Prof. Chih-Ho Lai:** Winner of the 22<sup>nd</sup> National Innovation Award.
- **Jo-Tsen Chen:** Recipient of the 2025 Prof. Chih-Chung Yen Scholarship, Taiwan Society of Microbiology.
- **Pei-Yi Tsai:** Recipient of the 2025 NSTC Undergraduate Research Grant.
- **Yu-Feng Tsai:** Recipient of the 2025 NSTC Undergraduate Research Grant.