CHI-YING F. HUANG

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CURRENT ACADEMIC & PROFESSIONAL APPOINTMENTS

2025–	Dean, College of Pharmaceutical Sciences, National Yang Ming Chiao Tung University (NYCU)
2025–	Distinguished Research Fellow, Taichung Veterans General Hospital
2025–	Domain Expert, Science and Technology Policy Advisory Office, National Science and Technology Council
2023–	Director, Chong Hin Loon Memorial Cancer and Biotherapy Research Center, NYCU
2023–	Board Director, Intech Biopharm Corporation (Legal Representative of the National Development Fund, Executive Yuan)
2019–	Distinguished Professor, Institute of Biopharmaceutical Sciences, NYCU
2007–	Joint Appointments, Institute of Clinical Medicine, Institute of Biomedical Informatics, and Department of Biotechnology and Laboratory Science in Medicine, NYCU
2016–	Joint Appointment, Department of Biochemistry, Kaohsiung Medical University

ACADEMIC & PROFESSIONAL EXPERIENCE

2024–2025	Associate Dean, College of Pharmaceutical Sciences, NYCU
2024	Honorary Professor, Hanoi University of Pharmacy, Hanoi, Vietnam
2023–2026	Board Director, Genovate Biotechnology Co., Ltd. (Legal Representative of the National Development Fund, Executive Yuan)
2020–2023	Chairman, Institute of Biopharmaceutical Sciences, NYCU
2019–2022	Board Director, PharmaEngine Inc. (Legal Representative of the National Development Fund, Executive Yuan)
2018–2020	Deputy Director, Biomedical Engineering Research and Development Center, NYCU
2018–2020	Coach, SPARK Program, NYCU
2011–2019	Professor, Institute of Biopharmaceutical Sciences, National Yang-Ming University
2011–2017	Chairman, Institute of Biopharmaceutical Sciences, National Yang-Ming University
2007–2011	Professor, Institute of Clinical Medicine, National Yang-Ming University
2005–2007	Associate Investigator, Institute of Cancer Research, National Health Research Institutes (NHRI)
2003–2005	Associate Investigator, Division of Molecular and Genomic Medicine, NHRI
1998–2003	Assistant Investigator, Division of Molecular and Genomic Medicine, NHRI
1994–1998	Postdoctoral Fellow, Molecular Pharmacology (Laboratory of James E. Ferrell, Jr.), Stanford University

EDUCATION

1988–1994 Ph.D. in Biochemistry and Biophysics (Laboratory of Donald J. Graves), Iowa State University

FIELDS OF SPECIALTY

Drug repurposing for cancer treatment; development of drug–biomarker pairs for precision medicine.

RESEARCH INTERESTS

Drug Screening, Repurposing & Cancer Stem Cells (CSCs)

Utilizing gene expression signatures (Connectivity Map) to match FDA-approved repurposed drugs with cancer stem cell (CSC) signatures to overcome chemoresistance and tumor recurrence. Key candidates include Trifluoperazine, Thioridazine, CY001, Thiostrepton, and statins.

Herbal Medicine & Natural Products

Exploring the anti-hepatic fibrosis, anti-CSC, and anti-inflammatory mechanisms of traditional botanical extracts and active compounds (e.g., Graptopetalum paraguayense, the Astragalus-based traditional Chinese medicine formula YQ1, and curcumin).

Extracellular Vesicles (EVs) & Nanocarriers

Pioneering extracellular vesicle (EV) biology, focusing on EV-based liquid biopsy diagnostic markers (e.g., DLL3 in small cell lung cancer [SCLC] and Glypican 1 in pancreatic cancer), engineered EV-mediated drug/RNA delivery (e.g., let-7a-5p for acute lung injury), and cartilage regeneration for osteoarthritis.

Tumor Biomarkers, Prognosis & Metastasis

Profiling clinical tumor datasets to identify key prognostic and metastatic genes, including early discoveries involving FLJ10540 and TP53 hotspot mutations for predicting the efficacy of gemcitabine and NBM-BMX. NBM-BMX is currently being evaluated in Phase 1b/2 clinical trials for GBM and other cancer types.

Bioinformatics, Systems Biology & Analytical Methods

Constructing protein interaction and phosphorylation databases, pioneering in situ proximity ligation assays (PLA) for cell signaling studies, and applying genome-scale metabolic network models (GEMs).

MAJOR DRUG DEVELOPMENT & TRANSLATIONAL RESEARCH

CY001

CY001, a clinically approved antiemetic agent, was identified as a promising anticancer candidate through Connectivity Map-based drug screening targeting cancer stem cell-associated gene signatures. Subsequent preclinical studies demonstrated its ability to suppress NSCLC cell proliferation, inhibit cancer stem-like properties, and enhance the therapeutic efficacy of chemotherapy and EGFR-targeted agents. These findings support its clinical translation into a PI-initiated Phase I clinical trial combining CY001 with pemetrexed maintenance therapy in advanced EGFR-wild-type NSCLC. Overall, the combination was well tolerated, with patients achieving overall survival benefits.

YQ1

YQ1 is an Astragalus-based traditional Chinese medicine formula identified through Connectivity Map-based drug screening as a promising multi-target therapeutic candidate for both lung adenocarcinoma and COVID-19. YQ1 has traditionally been used to relieve cough, fever, fatigue, and general weakness, and has demonstrated a favorable safety profile with potential lung-targeting properties. Preclinical studies suggest

that YQ1 may exert anti-inflammatory, antiviral, immunomodulatory, and lung-protective effects. YQ1 has been used as an adjuvant to chemotherapy in NSCLC patients and has shown improved clinical outcomes in a PI-initiated Phase II clinical trial. In addition, YQ1 has been used to alleviate pulmonary injury in 21 hospitalized patients with COVID-19 who responded inadequately to standard treatments.

Dibifree

Dibifree, a dietary phytomix, was developed using food-derived compounds with anti-diabetic bioactivities identified through Connectivity Map-based drug screening. Dibifree can improve glycemic control and reduce adiposity via modulation of the gut-pancreas-adipose-immune axis in type 2 diabetes. In a 7-month, randomized, double-blind, placebo-controlled, crossover, PI-initiated clinical trial, 40 adults with T2D received Dibifree or placebo as add-on therapy in two 3-month treatment periods separated by a 1-month washout period, with participants initially receiving placebo switched to Dibifree in the second period. Dibifree as an add-on therapy significantly reduced HbA1c, fasting glucose, and postprandial glucose levels compared with placebo, with sustained effects after washout and re-challenge.

MAJOR AWARDS & HONORS

- Leukemia Society of America Career Development Award (1998–1999)
- Leukemia Society of America Fellowship (1996–1998)
- Keystone Symposium Travel Award (1997)
- Stanford Dean's Postdoctoral Fellowship (1994–1995)
- Graduate Research Excellence Award, Iowa State University (1994)
- The Honor Society of Agriculture (Gamma Sigma Delta) (1989)
- 14th National Innovation Award (2017): An Astragalus-based Chinese herbal medicine inhibits cancer stem cell growth and improves the efficacy of cisplatin-based chemotherapy in non-small cell lung cancer
- 18th National Innovation Award (2021): Repurposing of YQ1, an Astragalus-based formula—the prevention and early intervention treatment of COVID-19
- Outstanding Mentor Award for International Students, NYCU (Academic Year 2023–2024)
- 2024 Future Tech Award: Manufacture and Medical Technology of Dual-targeted RNA-enriched Extracellular Vesicles
- Outstanding Mentor Award for International Students, NYCU (Academic Year 2024–2025)
- 22nd National Innovation Award (2025): Immune Lipoplex Nanoparticle (ILN) Biochip–Based Single-EV Detection and Liquid Biopsy Platform
- 22nd National Innovation Award (2025): AI-Powered Dual-Action BesKne-Exo® Extracellular Vesicle Therapy: Precision Regeneration for Osteoarthritis
- 2025 Future Tech Award: Multi-Omics-Guided Precision Oncology for Pancreatic Cancer
- 2026 Future Tech Award: CatiPep® from Taiwan: An AI-Engineered Peptide with Clinical Translation and Commercialization Potential for Precision Osteoarthritis Therapy with Global Competitiveness
- 2026 Taiwan Innotech Expo Invention Competition – Silver Medal Award: CXCL14-Based Compositions and Method for Enhancing Cartilage Regeneration

TECHNOLOGY TRANSFER

- 2009: Phosphoproteomic profiling during hepatocarcinogenesis (1,001 protein kinase/phosphatase /phospho-antibody preparations).

- 2011/2012: Computer-simulated drug screening platform for traditional Chinese medicine biosimilar projects.
- 2012: Graptopetalum paraguayense drug development (licensed for scale-up and CMC control; NYCU received a 33% revenue share).
- 2015: Anti-cancer stem cell and chemoresistance-reversal drug platforms (two distinct deals).
- 2018: Pharmaceutical composition and methods for non-small cell lung cancer (NSCLC).
- 2018: Novel CY001 compound for cancer therapy.

INDUSTRIAL & COMMERCIAL IMPACT

- Commercialization of PLA Antibody Pairs: Partnered with biotech firms to successfully develop and market 268 PLA-paired phosphoprotein antibodies and 612 PLA-paired protein–protein interaction antibodies.

PUBLICATIONS

220 published papers | h-index: 48

Selected Publications (10 representative papers)

1. Extracellular Vesicular Delta-Like Ligand 3 and Subtype Transcription Factors for Small Cell Lung Cancer Diagnosis. Advanced Science. 2025;12(22):e2416711.
2. Repurposing pitavastatin and atorvastatin to overcome chemoresistance of metastatic colorectal cancer under high glucose conditions. Cancer Cell International. 2025;25(1):79.
3. Utilizing TP53 hotspot mutations as effective predictors of gemcitabine treatment outcome in non-small-cell lung cancer. Cell Death Discovery. 2025;11:26.
4. Engineered Extracellular Vesicles Carrying Let-7a-5p for Alleviating Inflammation in Acute Lung Injury. Journal of Biomedical Science. 2024;31:30.
5. Extracellular Vesicular Analysis of Glypican 1 mRNA and Protein for Pancreatic Cancer Diagnosis and Prognosis. Advanced Science. 2024;11:e2306373.
6. Dual targeted extracellular vesicles regulate oncogenic genes in advanced pancreatic cancer. Nature Communications. 2023;14:6692.
7. Repurposing thioridazine for inducing immunogenic cell death in colorectal cancer via eIF2α/ATF4/CHOP and secretory autophagy pathways. Cell Communication and Signaling. 2023;21:184.
8. BMX, a specific HDAC8 inhibitor, with TMZ for advanced CRC therapy: a novel synergic effect to elicit p53-, β-catenin- and MGMT-dependent apoptotic cell death. Cell Communication and Signaling. 2022;20(1):200.
9. Identification of Thioridazine, an antipsychotic drug, as an antiglioblastoma and anticancer stem cell agent using public gene expression data. Cell Death and Disease. 2015;6:e1753.
10. Trifluoperazine, an antipsychotic agent, inhibits cancer stem cell growth and overcomes drug resistance of lung cancer. American Journal of Respiratory and Critical Care Medicine. 2012;186(11):1180–1188.

BOOKS & BOOK CHAPTERS

- Author/co-author of 3 book chapters.

PATENTS

- Holds 33 patents (issued and pending) across 14 patent families in international jurisdictions, including the United States, Japan, Taiwan, China, Europe, South Korea, Australia, Singapore, and Vietnam.