I-HAN (ELLEN) WANG, PH.D.

Translational Postdoctoral Fellow

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SUMMARY

Biomedical scientist with 8+ years of experience in molecular biology, organoid modeling, and translational analytics, with a strong track record of interdisciplinary collaboration and commercialization-aligned innovation.

- Led the development of **a chip-integrated organoid platform** for modeling tissue regeneration and tumor biology using human and mouse-derived specimens in a hospital-based setting
- Applied **lentiviral transduction and siRNA delivery** in patient-derived and mouse organoids to modulate gene expression and validate lineage-specific or disease-relevant targets
- Skilled in lentiviral vector production, titration, and **CRISPR-based gene editing** for functional interrogation in complex 3D models
- **Performed multi-omics integration** (scRNA-seq, bulk RNA-seq, proteomics, metabolomics) and molecular assays (qPCR, trajectory analysis) to identify biomarkers and therapeutic response pathways
- Developed **organoid–immune cell co-culture systems** to study immune modulation, resistance mechanisms, and cell-state dynamics
- Managed **biospecimen logistics** and assay development aligned with GLP, GTP, and GMP standards, ensuring reproducibility and translational readiness
- Early graduate research focused on **CRISPR-based metabolic biomarker screening** in cancer and nanomedicine delivery for pathway-specific therapeutic modulation
- Fluent in **wet and dry lab collaboration**, data interpretation, and cross-functional teamwork spanning clinical, academic, and analytical groups

EXPERIENCE

July 2025 – Sep 2025 (Now)
Medical Affairs & Business Development Consultant, Lifestyle Industries LTD., Taipei & US

- Invited after completion of postdoctoral research to provide consultation on **biomedical device translation**, driving **audit-ready preparation milestones**
- **Enabled industry–academia integration**, advancing translational research into commercialization pathways
- **Strengthened product readiness** through guidance on **positioning, compliance, and risk management**, leveraging organoid-on-a-chip expertise
- **Advanced US market entry exploration** by visiting clients, aligning biomedical insights with regulatory standards and clinical translation strategy
- Developed **10-year strategic plan** and collaborated with **leadership and KOLs** to drive industry–academia integration, technology translation, and industrial upgrading, maximizing corporate and societal impact

Dec 2020 – Jun 2025
Postdoctoral Translational Scientist, National Taiwan University College of Medicine/Affiliated Hospital

- Co-designed and pre-commercialized a **biochip-integrated organoid-on-a-chip platform**, enabling automated, high-throughput drug screening in physiologically relevant microenvironments

- **Built a personalized organoid biobank** using patient- and animal-derived glandular tissues, including salivary gland and lacrimal gland, for scalable experimental modeling and data reproducibility.
- **Performed multi-omics profiling** (transcriptomics, proteomics, metabolomics) to identify tissue-specific signatures, senescence biomarkers, and disease-associated pathways
- **Applied dimensionality reduction methods** (e.g., UMAP) combined with **multi-database integration** to analyze complex human physiology and drug metabolism, identifying key influencing factors
- **Developed and validated molecular assays** (qPCR, RNA-seq) for lineage tracking and target quantification, aligning protocols with GLP/GTP principles to support translational readiness
- **Performed histological processing** of organoid and tissue samples (FFPE and frozen), including grossing, embedding, sectioning, and staining for structural and phenotypic evaluation
- **Validated and optimized antibody staining protocols** (IHC/IF) for lineage, QC, and trajectory markers, including use of serum absorption and control staining to reduce background in complex 3D samples
- **Mapped tissue heterogeneity and regeneration capacity** in glandular progenitor cells through differentiation trajectory analysis (e.g., ductal vs. acinar)
- **Established 3D co-culture models** to study dynamic tumor–organoid interactions (e.g., invasion, repulsion, resistance), coupled with time-lapse imaging and immune cell isolation to investigate organoid–immune co-regulation mechanisms
- **Performed lentiviral vector transduction** in organoids and primary cells to generate stable clones for CRISPR editing and long-term functional studies
- **Led cold chain logistics** and biospecimen traceability for sensitive omics workflows and organoid sample management
- **Coordinated a Ministry of Science and Technology (MOST) integrative project**, serving as grant author and interdisciplinary team lead
- **Provided bilingual documentation and cross-functional communication** for technical, academic, and clinical collaborators

Aug 2016 – Oct 2020
Graduate Researcher, Institute of Biomedical Sciences, Academia Sinica/National Yang-Ming University

- **Engineered antibody-conjugated immunoliposomes** targeting $HER2^{+}$ gastric cancer, combining statin and dipyridamole as a novel nanomedicine formulation
- **Investigated cholesterol metabolism** and its influence on cancer stemness and metabolic reprogramming in gastric cancer models
- **Applied CRISPR editing and LC–MS-based proteomics** to identify non-canonical nuclear functions of metabolic enzymes
- **Guided rational design of targeted liposomes** by integrating molecular insights with translational delivery strategies

EDUCATION

Institute of Biomedical Sciences, Academia Sinica, National Yang-Ming University, Taipei, Taiwan,
Ph.D. in Program in Molecular Medicine, Oct 2020
2nd Prize – Graduate Student Oral Competition, Academia Sinica
National Yang-Ming University, Taipei, Taiwan, M.S. in Anatomy & Cell Biology, July 2016
3rd Prize – Master Thesis Competition, The Anatomical Association of Taiwan (14th Session)

SKILLS

- **Communication & Scientific Support**
  Bilingual Documentation (English and Mandarin)
  Scientific Writing: Grants, Papers, Proposals
  (Secured 5x–6x Higher Independent Research Funding)
  Graphic Design for Scientific Illustrations
  Technical Consultation & Team Collaboration

FDA regulatory pathway navigation (Class I–II devices, 510(k) predicate preparation)
IND application support (early-stage translational alignment)
IRB submission preparation and compliance (protocols, ethics review)
Audit-ready documentation and risk management
CRO coordination and timeline alignment for outsourced studies and deliverables
Cold chain logistics & data return control

- **Data & Bioinformatics**

  Multi-Omics Integration: Transcriptomics, proteomics, metabolomics, and secretome analysis for drug response and biomarker discovery.
  Transcriptomics: Bulk & scRNA-seq (10x, Rhapsody); QC pipelines, pseudotime, deconvolution, pseudobulk; public dataset mining (TCGA, Terra, GEO).
  Proteomics: LFQ analysis using MaxQuant and Perseus; integration with transcriptomic and phenotypic data.
  Metabolomics: Compound annotation via HMDB API, PubChem, ChEMBL; formula-based matching for unknowns.
  Secretome & Sensors: Collaboration with SPR, EG-ISFET, Luminex for multiplex, label-free biomarker profiling.
  Imaging & Spatial Data: QuPath annotation export, WSI-to-R integration; molecular–morphology correlation workflows.
  Tools: R (ggplot2, Bioconductor), bash, CRAN APIs; reproducible reporting via R Markdown.
  Clinical Translation: CRO coordination, clinical metadata alignment, biomarker traceability, and GxP informed QA.

- **Experimental & Technical Skills**

  From upstream sample sourcing, through midstream cell processing, to downstream multi-omics analysis
  Organoid Platform / Organoid-on-a-Chip
  Human and Mouse Organoid Derivation (Normal & Tumor), Primary Cell Culture
  Immune Cell Isolation Workflow (preprocessing, panel design, enrichment, quality control)
  Lentiviral Transduction for Organoid Genetic Modification
  Patient Derived Xenografts
  Plasmid Cloning, qPCR, ddPCR, CRISPR
  Wax sections, cryosections, and histological staining pipeline
  IHC/IF staining, Oil Red O staining, Extensive expertise with antibody validation
  RNA-seq (short-read) with ongoing PacBio HiFi exploration
  Routine Lab Works & Advanced Experiments (ELISA/MSD/Luminex/Flow Cytometry)
  Time-lapse Co-culture Tracking
  Laser Capture Microdissection (LCM)
  Animal Experiments: intraperitoneal (IP), intravenous (IV), and subcutaneous (SC) administration routes

RESEARCH INTERESTS

Molecular Medicine, Translational Medicine, Biomedical Research, Oncology, Aging, Cellular Senescence, Organoids, Tumoroids, Stemness & Metabolism, Multi-omics Integration

LICENSES & CERTIFICATIONS

- The certification of Taiwan Medical Technologist, 07/2014
- The certification of International Medical Technologist, MT(ASCP^{i})^{CM}, 08/2014

PUBLICATIONS & POSTERS

Ya-Chuan Hsiao, I-Han Wang, Tsung-Lin Yang. *Exploration of the Effect of Retinoic Acid on the Differentiation*

Potential of Salivary Gland Organoids. 2024 ISSCR Annual Meeting, Hamburg.

Ya-Chuan Hsiao, I-Han Wang, Tsung-Lin Yang. *Fibrotic remodeling and tissue regeneration mechanisms define the therapeutic potential of human muscular progenitors*. Bioeng Transl Med. 2022 Nov 26;8(2):e10439.

I-Han Wang, Tzu-Ting Huang, Ji-Lin Chen,Li-Wei Chu, Yueh-Hsin Ping, Kai-Wen Hsu, Kuo-Hung Huang, Wen-Liang Fang, Hsin-Chen Lee, Chian-Feng Chen, Chen-Chung Liao, Rong-Hong Hsieh, and Tien-Shun Yeh. *Mevalonate Pathway Enzyme HMGCS1 Contributes to Gastric Cancer Progression.* Cancers (Basel). 2020 May; 12(5): 1088.

I-Han Wang, Tzu-Ting Huang, Ji-Lin Chen, Tien-Shun Yeh. *HMGCS1 UP-REGULATES PLURIPOTENCY GENE EXPRESSION AND PROMOTES GASTRIC CANCER PROGRESSION*. 2017 ISSCR Annual Meeting, Boston. Poster board number: F-1169, 05/2017

I-Han Wang, Tzu-Ting Huang, An-Ming Wang, and Tien-Shun Yeh. *Identification and characterization of tumor growth-related genes in gastric cancer cells*. 2016 The 31st Joint Annual Conference of Biomedical Science, Taipei, Taiwan, 03/2016