CHIA-HAO TUNG

Cancer Biologist

Postdoctoral Scholar
Department of Genome Sciences, University of Washington

Research Interests:

• Cancer biology and genomics
• Computational biology
• Translational medicine

CONTACT INFO

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👤 EMPLOYMENT

23-Sep | Present

Postdoctoral scholar, Department of Genome Sciences
University of Washington   📍 Seattle, WA

• Supervised by Chia-Lin Wei, PhD
• **Research focus:** *Decoding the impact of Extrachromosomal DNA (ecDNA) condensates in cancer*

22-Jan | 23-Aug

Postdoctoral associate, Genome Technologies R&D
The Jackson Laboratory for Genomic Medicine   📍 Farmington, CT

• Supervised by Chia-Lin Wei, PhD
• **Research focus:** *Decoding the impact of Extrachromosomal DNA (ecDNA) condensates in cancer*

20-Jan | 21-Sep

Postdoctoral fellow, Institute of Clinical Medicine
National Cheng Kung University   📍 Tainan, Taiwan

• Supervised by Tse-Ming Hong, PhD
• *Deciphering the role of α-Catulin in lung cancer stemness*
• *Investigating the clinical relevance of deubiquitinase USP5 in lung cancer stemness*
• *Identification and investigation of long non-coding RNAs (lncRNAs) in regulating the stemness properties of lung cancer*
• *Study of the clinical assciation between lncRNAs and cancer stemness pathways in lung cancer using bioinformatic analysis*

🎓 EDUCATION

12-Sep | 19-Dec

National Cheng Kung University
Ph.D. in Basic Medical Sciences   📍 Tainan, Taiwan

• Supervised by Tse-Ming Hong, PhD
• **Dissertation title:** *Investigating the mechanisms underlying microRNA-150-5p-mediated epithelial-mesenchymal transition (EMT) and metastasis in ovarian cancer and its clinical significance*

SKILLS

-Highly skilled in performing and establishing *in vitro* and *in vivo* experiments for studying cancer stemness and metastasis.

-Well-experienced in NGS sample and library preparations.

-Extensive experienced in programming with Bash and R for integrated multiomics analysis using genomic data.

-Experienced in establishment of orthotopic mouse model for ovarian cancer (intrabursal injection).

*This resume was made with the R package **pagedown**.*

Last updated on 2023-11-22.

9-Sep | **National Cheng Kung University**
| | M.S. in Clinical Medicine
11-Jun | 📍 Tainan, Taiwan

- Supervised by Tse-Ming Hong, PhD
- **Thesis title:** *The role of microRNA-509-3p in recurrence of ovarian cancer*

🎖 HONORS AND AWARDS

2020 | **Honorary Membership of The Phi Tau Phi Scholastic Honor Society of the Republic of China**
The Phi Tau Phi Scholastic Honor Society of the Republic of China
📍 Tainan, Taiwan

2017 | **AACR-Aflac, Inc. Scholar-In-Training Award**
American Association for Cancer Research
📍 Shanghai, China

2016 | **Oral Presentation Merit Award**
Taiwan Genomics and Genetics Society
📍 Nantou, Taiwan

2014 | **Excellent Poster Award**
Taiwan Genomics and Genetics Society
📍 Nantou, Taiwan

🧬 RESEARCH EXPERIENCE

23-Sep | **Postdoctoral scholar, Department of Genome Sciences**
| | University of Washington
Present | 📍 Seattle, WA

- Developed innovative methods for differential chromatin interaction analysis using 3D genomic data

22-Jan | **Postdoctoral associate, Genome Technologies R&D**
| | The Jackson Laboratory for Genomic Medicine
23-Aug | 📍 Farmington, CT

- Executed molecular and cell biology experiments, encompassing cell culture, neurosphere culture, cell viability assays, flow cytometry, and FISH
- Proficiently constructed Next-Generation Sequencing (NGS) libraries for diverse applications, including Whole Genome Sequencing (WGS), RNA-seq, ChIP-seq, ChIA-PET, ChIATAC, and ChIA-Drop.
- Conducted data processing and pipeline runs on High-Performance Computing (HPC) clusters in a Linux environment.
- Applied advanced data analysis and visualization techniques using R.

20-Jan | **Postdoctoral fellow, Institute of Clinical Medicine**
| | National Cheng Kung University
21-Sep | 📍 Tainan, Taiwan

- Led bioinformatic research to elucidate the correlation between long non-coding RNAs (lncRNAs) and cancer stemness in lung adenocarcinoma.
- Pioneered methods for quantifying sphere formation in both lung and ovarian cancers.
- Investigated the impact of lncRNAs on the maintenance of lung cancer stem cells.
- Explored the clinical correlation of target genes at the protein level using the CPTAC dataset.
- Innovated methods for isolating and detecting miRNA expression in plasma from ovarian cancer patients.
- Conducted pathway score computations using single-sample gene set enrichment analysis (ssGSEA) to correlate with target gene expression in the TCGA datasets.

12-Sep
|
19-Dec

Ph.D. student, Institute of Basic Medical Sciences
National Cheng Kung University   📍 Tainan, Taiwan

- Explored the promotive role of miR-150-5p in the recurrence and metastasis of ovarian cancer
- Established a robust orthotopic ovarian cancer mouse model, providing evidence for the metastasis-promoting role of miR-150-5p
- Conducted thorough bioinformatic analyses, establishing a positive correlation between miR-150-5p and metastasis-associated signatures in clinical specimens using GEO and TCGA datasets
- Demonstrated the clinical relevance of the miR-150-5p/c-Myb/Slug axis in the mesenchymal subtype of ovarian cancer
- Investigated complex relationships among miR-150-5p, Slug, and the miR-506-514 cluster in ovarian cancer
- Evaluated the role of hypoxia in promoting the expression of miR-150-5p

9-Sep
|
11-Jun

Graduate Research Assistant, Institute of Clinical Medicine
National Cheng Kung University   📍 Tainan, Taiwan

- Developed and executed methods for isolating and measuring the expression of miRNAs in clinical specimens from primary and recurrent ovarian tumors.
- Investigated the effects of miR-509-3p on resistance to first-line chemotherapy (platinum/paclitaxel) in ovarian cancer.
- Successfully predicted and validated the target genes of miR-509-3p.

✎ TECHNICAL SKILLS

Cell Biology

- Cell culture
- Hypoxia cell culture
- Cancer sphere culture
- Stable cell line development
- Recombinant gene expression analysis
- Cytotoxicity assays (WST-1)
- Cell proliferation assays

- Cell cycle analysis via Propidium Iodide staining
- Flow cytometry analysis
- Light microscopy
- Transwell migration and invasion assay
- Wound healing assay
- Cell tracking analysis

Molecular Biology

- DNA and RNA isolation
- Plasmid cloning
- Design of short hairpin RNA
- Real time qPCR
- Immunofluorescence
- Immunohistochemistry

- In situ hybridization
- Fluorescence in situ hybridization
- Chromatin immunoprecipitation
- Preparation of NGS libraries (WGS, RNA-seq, ChIP-seq, ChIA-PET, ChIA-Drop, ChIATAC)

Biochemistry

- Gel electrophoresis
- Western blotting
- Co-immunoprecipitation

- *In vivo* deubiquitination assay
- *In vitro* luciferase reporter system (3'UTR luciferase reporter assay, promoter activity assay)

Animal works

- In Vivo Imaging System (IVIS) - Detect murine tumor growth and metastasis.
- Handling and dissection of mice
- Developed orthotopic ovarain cancer mouse model (intrabursal injection)

Bioinformatics and biostatistics

- Extensive experienced in programming with Bash and R for integrated multiomics analysis using genomic data, including WGS, RNA-seq, ChIP-seq, Cut&tag, ChIA-Drop, ChIA-PET, and ChIATAC
- Differential chromatin interaction analysis
- Prediction of potential transcription factor binding sites and microRNA binding sites
- Analysis of genetic and clinical informations from public databases (GEO, TCGA, CPTAC, CTRP, and CCLE)
- Biostatistical methods (Student's t test, Mann-Whitney U test, one way ANOVA, Wilcoxon signed-rank test, correlation analysis, Chi-square test, log-rank test, and Cox proportional hazard regression)

CONFERENCE PRESENTATIONS

2017

MicroRNA-509-3p enhances cisplatin efficacy in ovarian cancer
AACR International Conference on NEW HORIZON in CANCER RESEARCH: Research Propelling Cancer Prevention and Cures
📍 Shanghai, China
- **Poster presentation**. Authored with Keng-Fu Hsu, Yuh-Ling Chen, and Tse-Ming Hong
- **Selected for AACR-Aflac, Inc. Scholar-In-Training Award**

2016

CASZ1 promotes ovarian cancer metastasis
Taiwan-Japan Joint Conference on Genomic Studies and Annual Retreat of Taiwan Genomics and Genetics Society
📍 Nantou , Taiwan
- **Oral presentation**. Authored with Yi-Ying Wu, Chia-Lin Chang, Yuan-Jhe Chuang, Jia-En Wu, Yeong-Chang Chen, Yuh-Ling Chen, Tse-Ming Hong, and Keng-Fu Hsu
- **Selected for Oral Presentation Merit Award**

2014

Sensitization of ovarian cancer cells to cisplatin by microRNA-509-3p
Annual Retreat of Taiwan Genomics and Genetics Society, Nantou , Taiwan
📍 Nantou , Taiwan
- **Poster presentation**. Authored with Keng-Fu Hsu, Yuh-Ling Chen, and Tse-Ming Hong
- **Selected for Excellent Poster Award**

PUBLICATIONS

2023

Exosomal long noncoding RNA MLETA1 promotes tumor progression and metastasis by regulating the miR-186-5p/EGFR and miR-497-5p/IGF1R axes in non-small cell lung cancer
Journal of Experimental & Clinical Cancer Research. 2023; 42: 283.
- Hsu XR, Wu JE, Wu YY, Hsiao SY, Liang YL, Ya-Ju Wu, <u>**Tung CH**</u>, Huang MF, Lin MS, Yang PC, Chen YL[*], Hong TM[*]

Ubiquitin-specific peptidase 5 facilitates cancer stem cell-like properties in lung cancer by deubiquitinating β-catenin
Cancer Cell International. 2023; 23: 207.
- <u>**Tung CH**</u>, Wu JE, Huang MF, Wang WL, Wu YY, Tsai YT, Hsu XR, Lin SH, Chen YL[*], Hong TM[*]

MiR-455-5p suppresses PDZK1IP1 to promote the motility of oral squamous cell carcinoma and accelerate clinical cancer invasion by regulating partial epithelial-to-mesenchymal transition
Journal of Experimental & Clinical Cancer Research. 2023; 42: 40.
- Hsiao SY, Weng SM, Hsiao JR, Wu YY, Wu JE, <u>**Tung CH**</u>, Shen WL, Sun SF, Huang WT, Lin CY, Chen SH, Hong TM[*], Chen YL[*], Chang JY[*]

2022

A novel DNA aptamer targeting lung cancer stem cells exerts a therapeutic effect by binding and neutralizing Annexin A2
Molecular Therapy - Nucleic Acids. 2022; 27: 956-968.

- Wu YY, Hsieh IS, **Tung CH**, Weng CH, Wu JE; Yu JS, Hong TM[*], Chen YL[*]

α-Catulin promotes cancer stemness by antagonizing WWP1-mediated KLF5 degradation in lung cancer
Theranostics. 2022; 12 (3): 1173-1186.

- **Tung CH**, Huang MF, Liang CH, Wu YY, Wu JE, Hsu CL, Chen YL[*], Hong TM[*]

2020

DNA methylation maintains the CLDN1-EPHB6-SLUG axis to enhance chemotherapeutic efficacy and inhibit lung cancer progression
Theranostics. 2020; 10 (19): 8903-8923.

- Wu JE, Wu YY, **Tung CH**, Tsai YT, Chen HY, Chen YL[*], Hong TM[*]

MicroRNA-150-5p promotes cell motility by inhibiting c-Myb-mediated Slug suppression and is a prognostic biomarker for recurrent ovarian cancer
Oncogene. 2020; 39 (4): 862-876.

- **Tung CH**, Kuo LW, Huang MF, Wu YY, Tsai YT, Wu JE, Hsu KF, Chen YL[*], Hong TM[*]

2019

A DNA Aptamer Targeting Galectin-1 as a Novel Immunotherapeutic Strategy for Lung Cancer
Molecular Therapy - Nucleic Acids. 2019; 18: 991-998.

- Tsai YT, Liang CH, Yu JH, Huang KC, **Tung CH**, Wu JE, Wu YY, Chang CH, Hong TM[*], Chen YL[*]

2016

CASZ1 is a novel promoter of metastasis in ovarian cancer
American Journal of Cancer Research. 2016; 6 (6): 1253-1270.

- Wu YY, Chang CL, Chuang YJ, Wu JE, **Tung CH**, Chen YC, Chen YL, Hong TM, Hsu KF[*]

👥 REFERENCES

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