

CURRICULUM VITAE  
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## DEMOGRAPHIC AND PERSONAL INFORMATION

### Current Appointments

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### Personal Data

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### Education and Training

#### Undergraduate

1982-1986    B.S., Entomology, National Chung-Hsing University, Taichung, Taiwan

#### Doctoral/Graduate

1986-1988    M.S., Entomology, National Chung-Hsing University, Taichung, Taiwan

1991-1996    Ph.D., Entomology, University of Illinois, Urbana-Champaign, IL

#### Postdoctoral

1996-1998    Fellowship, Pharmacology, University of Pennsylvania, Philadelphia, PA

1999-2000    Fellowship, Pathology, Johns Hopkins University School of Medicine, Baltimore, MD

### Professional Experience

2000-2001    Research Associate, Pathology, Johns Hopkins University School of Medicine, Baltimore MD

2001-2002    Instructor, Pathology, Johns Hopkins University School of Medicine, Baltimore MD

2003-2009    Assistant Professor, Pathology, Johns Hopkins University School of Medicine, Baltimore MD

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## PUBLICATIONS

### Original Research [OR]

1. Perng FS, Yao MC, **Hung CF**, Sun CN. Teflubenzuron Resistance in Diamondback Moth (Lepidoptera, Plutellidae). *J Econ Entomol.* 1988;81(5):1277-1282.
2. Yao MC, **Hung CF**, Sun CN. Fenvalerate Resistance and Aldrin Epoxidation in Larvae of the Diamondback Moth. *Pestic Biochem Phys.* 1988;30(3):272-278.
3. **Hung CF**, Sun CN. Microsomal Monooxygenases in Diamondback Moth Larvae Resistant to Fenvalerate and Piperonyl Butoxide. *Pestic Biochem Phys.* 1989;33(2):168-175.
4. Kao CH, **Hung CF**, Sun CN. Parathion and Methyl Parathion Resistance in Diamondback Moth (Lepidoptera, Plutellidae) Larvae. *J Econ Entomol.* 1989;82(5):1299-1304.
5. Lin JG, **Hung CF**, Sun CN. Teflubenzuron Resistance and Microsomal Monooxygenases in Larvae of the Diamondback Moth. *Pestic Biochem Phys.* 1989;35(1):20-25.
6. **Hung CF**, Kao CH, Liu CC, Lin JG, Sun CN. Detoxifying Enzymes of Selected Insect Species with Chewing and Sucking Habits. *J Econ Entomol.* 1990;83(2):361-365.
7. Wu HN, Wang YJ, **Hung CF**, Lee HJ, Lai MM. Sequence and structure of the catalytic RNA of hepatitis delta virus genomic RNA. *J Mol Biol.* 1992;223(1):233-245.
8. **Hung CF**, Harrison TL, Berenbaum MR, Schuler MA. CYP6B3: a second furanocoumarin-inducible cytochrome P450 expressed in *Papilio polyxenes*. *Insect Mol Biol.* 1995;4(3):149-160.
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12. Ji H, Wang TL, Chen CH, Pai SI, **Hung CF**, Lin KY, Kurman RJ, Pardoll DM, Wu TC. Targeting human papillomavirus type 16 E7 to the endosomal/lysosomal compartment enhances the antitumor immunity of DNA vaccines against murine human papillomavirus type 16 E7-expressing tumors. *Hum Gene Ther.* 1999;10(17):2727-2740.
13. Lin HK, **Hung CF**, Moore M, Penning TM. Genomic structure of rat 3alpha-hydroxysteroid/dihydrodiol dehydrogenase (3alpha-HSD/DD, AKR1C9). *J Steroid Biochem Mol Biol.* 1999;71(1-2):29-39.
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15. Chen CH, Wang TL, **Hung CF**, Pardoll DM, Wu TC. Boosting with recombinant vaccinia increases HPV-16 E7-specific T cell precursor frequencies of HPV-16 E7-expressing DNA vaccines. *Vaccine.* 2000;18(19):2015-2022.
16. Chen CH, Wang TL, **Hung CF**, Yang Y, Young RA, Pardoll DM, Wu TC. Enhancement of DNA vaccine potency by linkage of antigen gene to an HSP70 gene. *Cancer Res.* 2000;60(4):1035-1042.
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225. Tseng SH, Lam B, Kung YJ, Lin J, Liu L, Tsai YC, Ferrall L, Roden RBS, Wu TC, **Hung CF**: A novel pseudovirus-based mouse model of SARS-CoV-2 infection to test COVID-19 interventions. *J Biomed Sci* 2021, 28(1):34.
226. Liu Y, DeLeon EMB, Okour S, Vang R, **Hung CF**, Wu TC, Ronnett BM, Xing D: Coexistence of conventional leiomyoma, fumarate hydratase-deficient atypical leiomyoma, and perivascular epithelioid cell tumor in a uterus: A Case Study. *Int J Gynecol Pathol.* 2021 40(2):134-140.
227. Talia RH, Lam B, Kung YJ, Lin J, Tseng SH, Ferrall L, Xing D, **Hung CF** and Wu TC: Development of a novel mouse model of spontaneous high-risk HPV E6/E7-expressing carcinoma in the cervicovaginal tract. *Cancer Res* 2021.
228. Mao CP, Wang SC, Su YP, Tseng SH, He L, Wu AA, Roden RBS, Xiao J, **Hung CF**: Protein detection in blood with single-molecule imaging. *Sci Adv* 2021, 7(33).
229. Lam B, Kung YJ, Lin J, Tseng SH, Tsai YC, He L, Castiglione G, Egbert E, Duh EJ, Bloch EM **Hung CF**: In vivo characterization of emerging SARS-CoV-2 variant infectivity and human antibody escape potential. *Cell Rep* 2021, 37(3):109838.
230. MacDonald A, Lam B, Lin J, Ferrall L, Kung YJ, Tsai YC, Wu TC, **Hung CF**: Delivery of IL-2 to the T Cell Surface Through Phosphatidylserine Permits Robust Expansion of CD8 T Cells. *Front Immunol* 2021, 12:755995.
231. MacDonald A, Wu TC, **Hung CF**: Interleukin 2-Based Fusion Proteins for the Treatment of Cancer. *J Immunol Res* 2021, 2021:7855808.

#### Review Articles [RA]

1. Moniz M, Ling M, **Hung CF**, Wu TC. HPV DNA vaccines. *Front Biosci.* 2003;8:d55-68.
2. **Hung CF**, Wu TC. Improving DNA vaccine potency via modification of professional antigen presenting cells. *Curr Opin Mol Ther.* 2003;5(1):20-24.
3. Boyd, D, **Hung CF**, and Wu TC. 2003. DNA vaccines for cancer. *IDrugs.* 6:1155-1164.
4. Pai SI, Lin YY, Macaes B, Meneshian A, **Hung CF**, Wu TC. Prospects of RNA interference therapy for cancer. *Gene Ther.* 2006;13(6):464-477.
5. **Hung CF**, Yang M, Wu TC. Modifying professional antigen-presenting cells to enhance DNA vaccine potency. *Methods Mol Med.* 2006;127:199-220.
6. Mao CP, **Hung CF**, Wu TC. Immunotherapeutic strategies employing RNA interference technology for the control of cancers. *J Biomed Sci.* 2007;14(1):15-29.
7. Mao CP, Lin YY, **Hung CF**, Wu TC. Immunological research using RNA interference technology. *Immunology.* 2007;121(3):295-307.
8. Tsen KT, Tsen SW, Chang CL, **Hung CF**, Wu TC, Kiang JG. Inactivation of viruses by laser-driven coherent excitations via impulsive stimulated Raman scattering process. *J Biomed Opt.* 2007;12(6):064030.
9. Monie A, **Hung CF**, Wu TC. Preventive and therapeutic HPV vaccines. *Curr Opin Investig Drugs.* 2007;8(12):1038-1050.
10. **Hung CF**, Ma B, Monie A, Tsen SW, Wu TC. Therapeutic human papillomavirus vaccines: current clinical trials and future directions. *Expert Opin Biol Ther.* 2008;8(4):421-439.
11. **Hung CF**, Wu TC, Monie A, Roden R. Antigen-specific immunotherapy of cervical and ovarian cancer. *Immunol Rev.* 2008;222:43-69.
12. Monie A, **Hung CF**, Roden R, Wu TC. Cervarix: a vaccine for the prevention of HPV 16, 18-associated cervical cancer. *Biologics.* 2008;2(1):97-105.
13. Ma B, Roden RB, **Hung CF**, Wu TC. HPV pseudovirions as DNA delivery vehicles. *Ther Deliv.* 2011;2(4):427-430.
14. Knoff J, Yang B, **Hung CF**, Wu TC. Cervical Cancer: Development of Targeted Therapies Beyond Molecular Pathogenesis. *Curr Obstet Gynecol Rep.* 2014;3(1):18-32.
15. Yang A, Farmer E, Wu TC, **Hung CF**. Perspectives for therapeutic HPV vaccine development. *J Biomed Sci.* 2016;23(1):75.
16. Yang A, Jeang J, Cheng K, Cheng T, Yang B, Wu TC, **Hung CF**. Current state in the development of candidate therapeutic HPV vaccines. *Expert Rev Vaccines.* 2016;15(8):989-1007.

17. Yang A, Farmer E, Lin J, Wu TC, **Hung CF**. The current state of therapeutic and T cell-based vaccines against human papillomaviruses. *Virus Res.* 2017;231:148-165.

#### Book Chapters, Monographs [BC]

1. **Hung CF**, Yang M and Wu TC (2006) Modifying professional antigen presenting cells to enhance DNA vaccine potency. *Methods in Molecular Medicine*, Vol 147: DNA Vaccines: Methods and Protocols. Edited by: M.W. Saltzman, H. Shen, J.L. Brandsma. 199-220.
2. Tsen SW, **Hung CF**, and Wu TC (2008) Antigen-specific cancer immunotherapy: HPV-associated cervical cancer as a model system. Book Chapter of *Cancer Vaccines and Tumor Immunology*, Editors B.D. Johnson, R. Orentas and J.W. Hodge Chapter 6.
3. **Hung CF**, A. Monie and Wu TC (2007) Immunotherapy of Angiogenesis with DNA Vaccines. Book Chapter of *Angiogenesis: An integrative approach from science to medicine*. Editors: Drs. William D. Figg and Judah Folkman. Springer US. Chapter 39: pp 451-460.
4. Tsen SW, **Hung CF**, and Wu TC (2007) Antigen-specific cancer immunotherapy: HPV-associated cervical cancer as a model system. Book Chapter of *Cancer Vaccines and Tumor Immunity*, Edited by Rimas Orentas, James W. Hodge and Bryon D. Johnson. John Wiley& Son, Inc. Chapter 6: pp 79-94.
5. Monie A, **Hung CF**, Roden R and Wu TC (2007) Cervarix: A vaccine for the prevention of HPV 16, 18-associated cervical cancer. *Biologics: Targets & Therapy* 2.
6. Roden R, **Hung CF**, A. Monie and Wu TC (2008) HPV Vaccines. *Translational Research in Biomedicine Vol. 1: Human Cancer Viruses* Edited by, John Nicholas, Kuan-Teh Jeang and T.-C. Wu., S. Karger AG. 37-62.
7. Ma B, **Hung CF**, and Wu TC (2008) DNA vaccines for the human papilloma virus. *Tumor Associated Antigens-a handbook* Edited by Olivier Gires and Seliger. Wiley-VCH.
8. **Hung CF**, B. Ma, Xu Y and Wu TC (2012) "Strategies to improve DNA vaccine potency: HPV-associated cervical cancer as a model system." *Gene Vaccines*. Edited by Josef Thalhamer and Richard Weiss. Springer. pages: 37-65.
9. Wang C, Ma B, Chen A, **Hung CF**, and Wu TC (2012) Perspectives on Therapeutic HPV Vaccines: Where Are We Now? *HPV and Cervical Cancer: Achievements in Prevention and Future Prospects* Edited by Borruto, Franco; De Ridder, Marc (Eds.) Springer.
10. Tran NP, **Hung CF**, Roden R, Wu TC (2013) Control of HPV Infection and Related Cancer Through Vaccination. *Viruses and Human Cancer-From Basic Science to Clinical Prevention*. Edited by Mei-Hwei Chang and Kuan-Teh Jeang. Springer, Recent Results in Cancer Research Volume 193, 2014, pp 149-171.
11. Cheng MA, Farmer E, Yang A, Wu TC, Tan M, **Hung CF** (2019). Overview of Therapeutic HPV Vaccines. In Lee SJ (Ed.) *HPV Infection and Cervical Neoplasia: Bench to Bed*, in press.

#### Books, Textbooks [BK] None

### FUNDING

#### EXTRAMURAL Funding

Current

9/1/18-8/31/23

Mouse modeling of HPV Infection

R01CA233486

NCI/NIH

\$450,000

Role: PI, 20% effort

4/1/19-3/31/24

Development of novel spontaneous HPV cervicovaginal carcinoma models for cancer immunotherapy

R01CA237067

NCI/NIH

\$450,000

PI: Wu

Role: Co-Investigator, 7% effort

9/1/19-8/31/24

A Phase I Safety and Immunogenicity Study of I.M. Electroporation of pNGVL4a-hCRTE6E7L2 DNA Vaccine in Patients with HPV-16+ High-grade Squamous Intraepithelial Lesions. *SPORE in Cervical Cancer*

P50CA098252

NCI/NIH

	<p>\$2,500,000  PI: Wu  Role: Co-Leader; Projects 2, 10% effort</p>
2/1/20-1/31/22	<p>Albumin-FMS-like tyrosine kinase 3 ligand (Alb-Flt3L) fusion protein as a novel adjuvant to enhance the immunogenicity and therapeutic and prophylactic efficacies of a HPV protein vaccine  R21CA234516  NCI/NIH  \$125,000  Role: PI, 18% effort</p>
7/1/20-6/30/22	<p>Novel immunotherapeutic regimen combining the dendritic cell expansion power of albumin-Flt3L and inflammatory cues of salmonella  R21DE029910  NCI/NIH  \$250,000  Role: PI, 15% effort</p>
9/7/20-8/31/23	<p>Tension-Sensitive Drug Release System to Enhance Targeting Selectivity  1R21EB029677-01  NCI/NIH  \$125,000  Role: Co-Investigator, 5% effort</p>
7/1/21-6/30/23	<p>Novel strategy combined with targeted radiation therapy unleashes potent antitumor immunity in HPV + head and neck cancer  R21CA234516  NCI/NIH  \$125,000  Role: PI, 20% effort</p>
Pending	
9/1/22-3/31/27	<p>The Development of novel immunotherapy for head and neck.  U01DE029176  NCI/NIH  \$500,000  PI: Wu  Role: Co-PI, 10% effort</p>
4/1/22-3/31/27	<p>Integrated targeting of TLR9 and phosphatidylserine following radiation therapy for the treatment of HPV-associated head and neck cancer  R01CA258445  NCI/NIH  \$450,000  Role: PI, 20% effort</p>
Previous	
7/1/03-6/30/06	<p>Development of novel human immunology assays for human HPV vaccine trials  Flight Attendant Medical Research Institute  \$ 108,500  Role: PI, 30% effort  Role: PI</p>
1/6/05-1/5/08	<p>Development of a novel immunotherapy for ovarian cancer  Alliance for Cancer Gene Therapy  \$146,145</p>

	Role: PI, 25% effort
71/07-6/30/11	Control of ovarian cancer by immunotherapy Research Scholar Grant (American Cancer Society) \$125,000 Role: PI, 25% effort
12/1/13-11/30/15	Molecular pathogenesis and host response following persistent E6/E7 expression R21 AI109259-01 \$125,000 Role: PI, 20% effort
12/1/15-11/30/17	Innovative Strategy to Generate Antigen-Specific Cytotoxic Lymphocytes R21CA194896-01 \$125,000 Role: PI, 20% effort
9/1/12-8/31/17	Enhancing HVP-16 E6/E7 Specific Antitumor Immunity R01 CA114425 NIH/NCI \$176,030 PI: Wu Role: Co-Investigator, 8% effort
4/1/14-3/31/19	Ovarian Cancer Gene Therapy Using HPV Pseudovirion RO1 CA183040 NIH \$207,000 PI: Wu Role: Co-Investigator, 10% effort
12/1/14-11/30/17	Immune Evasion by Nanog-Mediated Changes to the Tumor Microenvironment R21 CA180953 NIH \$108,750 PI: Wu Role: Co-Investigator, 5% effort

**INTRAMURAL FUNDING** None

**CLINICAL ACTIVITIES** None

### **EDUCATIONAL ACTIVITIES**

#### **Teaching**

JHMI/Regional

2002-present Lecturer, graduate students, Lecture in Course of Pathology and Disease Mechanisms, Johns Hopkins University School of Medicine

Classroom instruction None

CME instruction None

Workshops/seminars None

#### **Mentoring**

Pre-doctoral Advisees/Mentees

Undergraduate Students

2001 Jeremy Juang, M.D., Ph.D. student at Stanford University, recipient of the Provost's Undergraduate Research Award, OR29, 31, 32, 34, 35, 36, 38, 41, 42, 44, 45

2001-2006 Michelle Moniz, Washington University School of Medicine, recipient of the Woodrow Wilson Undergraduate Research Fellowship, OR 37, 41, RA 1

2006-2011 Barbara Ma, medical student at New York Medical College, OR 87, 101, 119, 123, 128, 130, 133, 141, 142, 143, 148, BC 7, 9

2006-2009 Shaw-Wei David Tsen, M.D., Ph.D. student at University of Washington, St. Louis, OR 83, 84, 85, 87, 107, 110, 111, 173, BC 2, 4

2006-2009 Chih-Ping Mao, Johns Hopkins M.D., Ph.D. student, recipient of the Provost's Undergraduate Research Award, OR 66, 79, 80, 86, 104, 120, 129, 139, 149, 150, 170, 203, 212

2007-2011 Annie Wu, M.D., Ph.D. student at Hopkins University, recipient of the Provost's Undergraduate Research Award, OR 102, 103, 104, 105, 106, 116, 123, 132, 153

2014-2015 Emily Robitschek, undergraduate student at Colorado State University

2014 Olivia Leung, undergraduate student at Johns Hopkins University

2015 Joby Tsai, undergraduate student at Johns Hopkins University

2016 Jovana Cavillo, undergraduate student at Williams College

2016-2019 John Lin, undergraduate student at Johns Hopkins University, OR 194, 199

2016-2017 Sizhe (Jem) Liu, undergraduate student at Johns Hopkins University; attending Northwestern in Fall 2017 to complete a PhD program in Biological Sciences

2017-2019 Yu-Jiu (Ray) Kung, undergraduate student at Johns Hopkins University, OR 220

2017-2019 Turner Schwartz, undergraduate student at Johns Hopkins University

#### Medical Students

2009 Tsung Ju (Leon) Lee, medical student at Chang Gung University

2009 Joseph Wan, medical student at Chang Gung University

2009 Wei-Hung Weng, medical student at Chang Gung University

2009 Bin-Chi (Bill) Wu, medical student at Fu-Ren University School of Medicine

2009 Clarence Lin, medical student at Howard University

2010 Ray Mao, medical student at National Chang Kung University

2011 Candice Chang, medical student at Chang Gung University

2011 Yu-Han (Grace) Hsueh, medical student at National Chang Kung University

2011 Shu-yu Liu, medical student at National Chang Kung University

2013 Philip Chiang, medical student at National Taiwan University

2013 Andrew Yang, medical student at National Taiwan University

2014-2015 Edward Chiu, medical student at National Taiwan University

2014 Ellen Tseng, medical student at National Taiwan University

2014 Amy Huang, medical student at National Taiwan University

2015 Ching-yu Frank Lu, medical student at National Yang-Ming University

2015 Jou-Chien Ruth Liao, medical student at National Yang-Ming University

2015 Hawk Lo, medical student at China Medical University, Taiwan

2016 Shih-Chieh (Jay) Yen, medical student at National Taiwan University

2016 Chun-Lin (Chris) Kuo, medical student at National Defense Medical Center

2016 Chung Wen (Chinese) Wu, medical student at National Defense Medical Center

2017 Yi Ting Huang (medical student at National Taiwan University)

2017 Chen-Yu (Alexandra) Pan, medical student at National Taiwan University

2017 Yen-Chun (Galen) Wang, medical student at National Defense Medical Center

2017 Chia-Chuan (Allen) Liu, medical student at National Defense Medical Center

2017 Claire Huang, medical student at National Yang Ming University

2017 Yu-Sin (Jennifer) Ting, medical student at National Yang Ming University

2017 Po-Yi (Alex) Wu, medical student at National Yang Ming University

2017 Po-Tsen (Roger) Kiu (medical student at National Yang Ming University)

2017 Yi-Hsuan (Sophia) Huang, medical student at National Yang Ming University

2018 Yu-Ching (Tiffany) Wang, medical student at National Yang Ming University

2018 Li-Chi (Isaac) Chen, medical student at National Yang Ming University

2018 Yu-Chieh (Sophia) Shiao, medical student at National Yang Ming University

2018 Jen Wei (Jewel) Hong, medical student at National Yang Ming University

2018 Yu-Hsin (David) Liang, medical student at National Taiwan University



## Graduate Students

- 1996-2000 Ken-Yu Lin, Assistant Professor at Albert Einstein College of Medicine, recipient of the 2000 Howard Hughes Graduate Student Research Award, OR 12, 31, 36, 39, 77, 108, 115
- 1997-2001 Bruce Huang, OR 66, 86, 99
- 2005-2010 Jesse Rowley, Assistant Professor at the University of Utah, OR 77, 96, 109
- 2006-2010 Tong Zhang, OR 143
- 2006 Huang Yu Yang OR133, 165
- 2007 Pei-Yang (Phillip) Hsu
- 2007 Chiaki Nakata
- 2008 Waipan Chan
- 2010 Christopher Nirschl
- 2013 Chao-Yi Wu
- 2012-2017 Yi-Hsin (Sophie) Lin
- 2006-2018 Chih-Ping Mao, Johns Hopkins M.D.-PhD. student, won Young Investigator Award, OR 66, 79, 80, 86, 104, 120, 129, 139, 149, 150, 170, 203, 212
- 2016-present Brandon Lam, Immunology Graduate Program, Thesis student, OR 212, 213, 214, 216, 220
- 2016-present Talia Henkle, Immunology Graduate Program, Thesis student, OR202
- 2017-present Alana MacDonald, Immunology Graduate Program, Thesis student
- 2019-present Marisa Mitchell-Flack, Immunology Graduate Program, rotating student

## Post-doctoral Advisees/Mentees

- 2001-2003 Cheng-Tao Lin, M.D., Associate Professor in Department of Obstetrics and Gynecology of the Chang-Gung Memorial Hospital in Taiwan
- 2001-2003 Tae Woo Kim, Ph.D., Associate Professor at the Korea University in South Korea, OR 34, 35, 36, 41, 42, 43, 44, 45, 46, 47, 52, 53, 54, 73, 74, 94, 108, 115, 150, 156, 212
- 2005-2008 Dae Jin Kim, M.D., Ph.D., Assistant Professor in the Chung-Ang University, South Korea
- 2006-2007 Dan Lu, Ph.D., OR 77, 106
- 2006-2007 Chih-Long Chang, M.D., Ph.D., Associate Professor at Mackay Memorial Hospital, Taipei, Taiwan, OR 63, 64, 83, 84, 101, 135, 145, 155
- 2006-2007 Chi-Mu Chuang, M.D., Assistant Professor at National Yang-Ming University, Taipei, Taiwan, OR 97, 102, 103, 104, 105, 113, 168
- 2006-2008 Chih-Wen Tseng, M.D., Assistant Professor at Chang Gung University College of Medicine, Taiwan, OR 97, 98, 99, 112
- 2008-2009 Tae Heung Kang, Ph.D., OR 59, 73, 74, 108, 114, 115, 120, 122, 127, 129, 131, 138, 139, 143, 147, 148, 149, 150, 151, 152, 156, 180, 210, 212, 213, 221
- 2008-2009 Yuqian Zhang, Ph.D., OR 125, 126
- 2008-2010 Qi Zeng, M.D., OR 112, 132, 134, 142, 167, 168, 195
- 2009-2010 Weiting Hsueh, Ph.D.
- 2009-2010 Wen-Chung Chen, M.D.
- 2010-2011 An-Jen Chiang, M.D., OR 138
- 2010-2011 Bianca Gomez, Ph.D., OR 137, 142, 146
- 2010-2012 Sharon Tsai, M.D.
- 2011-2012 Sung Yong Lee, Ph.D., OR 150, 151, 152, 159, 163, 169, 210
- 2011-2012 Lihua Yang, M.D.
- 2012-2014 Ruey-Shyang Soong, OR 151, 152, 154, 162, 163, 183, 198, 215
- 2012-2014 Yun-Yan Sun, M.D., OR 172, 184, 193
- 2013-2014 Liwen Song, M.D., OR 159, 160, 161, 162, 163, 170, 184
- 2013-2015 Sung-Jong Lee, M.D., OR 170, 179
- 2013-2015 Jay Yang, M.D.
- 2014-2015 Jian Miao, M.D., OR 172
- 2014-2015 Xuquen Xu, M.D.
- 2014-2015 Liping Han, M.D., Ph.D.
- 2014-2016 Jin Qiu, M.D., Ph.D.
- 2014-2017 Yu-Min Chuang, M.D., Ph.D.
- 2015-2016 Ying Ma, M.D., Ph.D.
- 2015-2016 Feng Woei Tsay M.D.
- 2015-2016 Zuequn Xu Ph.D.

2015-2016	Pei-Ming Yang
2015-2018	Yu-Pin Su, D.V.M.
2016-2017	Daewoo Lee
2016-present	Ssu-Hsueh Tseng, postdoctoral fellow, Department of Pathology of the Johns Hopkins University School of Medicine
2018-present	Sung Taek Park, M.D., Ph.D., postdoctoral fellow, Department of Pathology of the Johns Hopkins University School of Medicine
2019-present	Shih-Chin (Gina) Wang, Ph.D., postdoctoral fellow, Department of Pathology of the Johns Hopkins University School of Medicine
2020-present	Jin-Hwi Kim, M.D., postdoctoral fellow, Department of Pathology of the Johns Hopkins University School of Medicine

#### Thesis committees

2006-2010	Ming Yang, Biomedical Engineering, “Molecularly Targeted Therapeutic Polymer Nanoparticles for Ovarian Cancer,” committee member
2009-2014	Ashley Saint-Fleur, Immunology, “Induction of immune responses to wilms tumor 1 (wt1), a self-antigen, in mice,” committee member
2010-2014	Kihyuck Kwak, Pathology, “Development of prophylactic human papillomavirus vaccines,” committee member
2011-2015	Joshua Wang, Pathology, “Immunology and vaccinology of human papillomavirus minor capsid protein L2,” committee member
2011-2015	Yi-Hsin Lin, Pathology, “Generation of a spontaneous HPV16 E6/E7 expressing pre-clinical tumor model for testing therapeutic interventions,” committee member
2011-2017	Rosie Jiang, Pathology, “Therapeutic Vaccine and Drug Development for Gynecologic Cancer,” committee member
2016-2019	Shih-Chin (Gina) Wang, Biochemistry, Cellular and Molecular Biology, “Developing single-molecule augmented capture (SMAC) to detect biomarkers in human blood,” committee member
2016-present	Brandon Lam, (Immunology, committee member
2016-present	Talia Henkle (Immunology Graduate Program, Ph.D. Degree, Thesis Advisory Committee)
2017-present	Alana MacDonald, Immunology, committee member

Educational Program Building/Leadership	None
Educational Demonstration Activities to external audiences	None

## RESEARCH ACTIVITIES

### Research Focus

My research focuses on developing vaccination strategies for the prevention and treatment of cervical and ovarian cancers. My lab has developed several approaches to enhance immunologic responses against different cancers. Some of these involve (1) targeting antigen into dendritic cells (DCs), (2) targeting antigen into major histocompatibility class I and II processing pathways, (3) enhancing intercellular spreading of antigen, and (4) combining antigen-specific immunotherapy with agents to limit angiogenesis. Recently, my lab has utilized annexin V (AnnV) as an immune checkpoint inhibitor and tumor-homing molecule for the treatment of cancer, as AnnV greatly enhances the immunogenicity and antitumor efficacy after chemoradiation. Additionally, I have developed a novel universal immunotherapeutic molecule (Alb-Flt3L) by harnessing albumin’s ability to extend serum half-life and preferential trafficking towards lymph nodes as well as the properties of Flt3L to potently expand cross-presenting DCs. Alb-Flt3L enhances immunological responses mediated by cross-presenting DCs and subsequently generates potent anti-tumor responses.

Research Program Building/Leadership	None
Research Demonstration Activities	None

### Inventions, Patents, Copyrights

2/9/00	Investigator, Fusion of Heat shock protein 70 to antigens enhance the potency of DNA vaccines, US Patent number: 6,734,173, Date Awarded: 5/11/04
10/20/00	Investigator, Fusion of Heat shock protein 70 to antigens enhance the potency of DNA vaccines, Australia Patent number: 784605, Date Awarded: 5/11/06

10/20/00 Investigator, Fusion of Heat shock protein 70 to antigens enhance the potency of DNA vaccines, European Patent number: 1,222,289, Date Awarded: 4/16/08

8/2/01 Investigator, Fusion of Calreticulin to antigens enhance the potency of DNA vaccines, Japan Patent number: 5,087,201, Date Awarded: 9/14/12

4/4/02 Investigator, Cancer Immunotherapy using a DNA Vaccine Encoding the Translocation Domain of a Bacterial Toxin Linked to a Tumor Antigen, US Patent number: 8,128,922, under exclusive option-licensed agreement, Date Awarded: 3/6/12

8/4/03 Investigator, Fusion of Calreticulin to antigens enhance the potency of DNA vaccines, US Patent number: 7,342,002, Date Awarded: 3/11/08

8/8/03 Investigator, Enhancement of Nucleic Acid Vaccine Potency by Intercellular Spreading and Enhancement of MHC Class I Presentation of Antigen Linked to Herpesvirus VP22 Protein, US Patent number: 7,318,928, under exclusive optioned-licensed agreement, Date Awarded: 1/15/08

3/5/04 Investigator, Enhancement of Suicidal DNA Vaccine Potency by Linkage Mycobacterium Tuberculosis Heat Shock Protein 70 to an Antigen, US Patent number: 7,557,200, available from Hopkins Tech Transfer office, Date Awarded: 7/7/09

5/5/04 Investigator, Antitumor Effects Generated by pNGVL4a-Sig/E7 (detox)/HSP70 DNA Vaccine Administered Through Gene Gun, Biojector/Syringe US Patent: 10/555,669, Date Awarded: 11/4/10

7/3/07 Investigator, Modification of Professional Antigen-Presenting Cells with Small Interfering RNA (siRNA) Targeting BAK and/or BAX Can Enhance DNA Vaccine Potency US Patent number: 11/773,162, available from Hopkins Tech Transfer office, Date Awarded: 4/21/15

7/3/07 Investigator, RNA interference that blocks expression of pro-apoptotic proteins potentiates immunity induced by DNA and transfected dendritic cell vaccines US Patent number: 9,011,866, available from Johns Hopkins University, Date Awarded: 4/21/15

8/22/07 Investigator, Epigallocatechin-3-Gallate (EGCG) Enhances CD8+ T Cell Mediated Anti-Tumor Immunity Induced by DNA Vaccination, US Patent number: 12/438,300, available from Hopkins Tech Transfer office, Date Awarded: 10/30/10

1/15/08 Investigator, Fusion of Calreticulin to antigens enhance the potency of DNA vaccines, US Patent number: 8,007,781, Date Awarded: 8/30/11

3/6/08 Investigator, Administration of DNA Vaccines with DNA Encoding Ii-PADRE Generates Potent PADRE-specific CD4+ T-cell Immune Responses and Enhances Vaccine Potency, US Patent number: 12/043,656, available from Hopkins Tech Transfer office, Date Awarded: 7/21/15

3/7/08 Investigator, Control of Human Mesothelin-expressing Tumors By DNA Vaccines, US Patent number: 12/049,763, Date Awarded: 4/30/09

3/17/08 Investigator, Generation and Characterization of a Preventive and Therapeutic HPV DNA Vaccine, US Patent number: 12/049,59, under exclusive option-licensed agreement, Date Awarded: 10/23/08

9/15/08 Investigator, Development of Mesothelin-Specific Cancer Immunotherapy Using an Ascitogenic Ovarian/Peritoneal Tumor Model, US Patent number: 8,137,90, Date Awarded: 09/15/2008

4/28/10 Investigator, Combination of Viral Oncolysis and Tumor-specific Immunity to Control Established Tumors, Japan Patent number: 12/508,648, under exclusive option-licensed agreement, Date Awarded: 2/6/15

04/28/10 Investigator, US Patent number: 13/318,028 Combination of Viral Oncolysis and Tumor-specific Immunity to Control Established Tumors, under exclusive option-licensed agreement, Date Awarded: 9/27/12

4/28/10 Investigator, Combination of Viral Oncolysis and Tumor-specific Immunity to Control Established Tumors, Brazil Patent number: PI1011902-7, under exclusive option-licensed agreement. Date Awarded: 3/3/11

4/28/10 Investigator, Canada Patent number: 2,760,310 Combination of Viral Oncolysis and Tumor-specific Immunity to Control Established Tumors, under exclusive option-licensed agreement, Date Awarded: 3/3/11

4/28/10 Investigator, Combination of Viral Oncolysis and Tumor-specific Immunity to Control Established Tumors, Australia Patent number: 2010246273, under exclusive option-licensed agreement, Date Awarded: 7/17/14

4/28/10 Investigator, Combination of Viral Oncolysis and Tumor-specific Immunity to Control Established Tumors, European Patent number: 10772568.1, under exclusive option-licensed agreement, Date Awarded: 3/7/12

- 6/13/12 Investigator, Cancer Immunotherapy Using Irradiated Tumor Cells Secreting Hsp 70, US Patent number: 13/495,436, available from Hopkins Tech Transfer office, Date Awarded: 12/1/15
- 6/13/12 Investigator, Delivery of DNA Vaccines Using Human Papillomavirus Pseudovirions, US Patent number: 13/338,889, available from Hopkins Tech Transfer office, pending
- 9/13/13 Investigator, Compositions and Methods for Rendering Tumor Cells Susceptible to CD8+ T Cell-Mediated Killing, US Patent number: 20,150,231,239, available from Johns Hopkins University, Date Awarded: 8/20/2015
- 11/27/13 Investigator, Innovative HDAC Inhibitor Enhances E7-specific CD8+ T-cell Mediated Antitumor Immunity Induced by DNA Vaccine, US Patent number: 61/731,225; 61/776,123, under exclusive option-licensed agreement, Date Awarded: 6/5/14
- 8/6/14 Investigator, Priming with Therapeutic HPV pNGVL4a-sig/E7(detox)/HSP70 DNA Prime Followed by Boosting with TA-HPV Vaccinia Vaccine Generates Potent Antigen-specific CD8+ T Cell Responses with Resident T Cell Phenotypes and Therapeutic Antitumor Effects, US Patent number: 61/862,768, under exclusive option-licensed agreement, Date Awarded: 11/3/16
- 3/12/15 Investigator, Selectively Targeted Coating of Tumor Cells with Foreign Antigenic Peptide Renders Tumor Cells Susceptible to Antigen-specific CD8+ T Cell-mediated Killing, US Patent number: 61/701,094, available from Hopkins Tech Transfer office, Date Awarded: 2/7/17
- 8/6/15 Investigator, Compositions and methods for enhancing antigen-specific immune responses, US Patent number: 14/453,313, available from Hopkins Tech Transfer office, Date Awarded: 2/18/16
- 8/13/15 Investigator, Non-invasive cancer detection and analysis by single-molecule imaging, US Patent number: 16/336,124, available from Hopkins Tech Transfer office, Date Awarded: 3/25/19
- 1/15/16 Methods for Enhancing Antigen-Specific Immune Responses, US Patent number: 15/543,806, available from Hopkins Tech Transfer office, Date Awarded: 6/21/18
- 9/8/17 Compositions comprising albumin-fms-like tyrosine kinase 3 ligand fusion proteins and uses thereof US Patent number: 16/244,200, available from Hopkins Tech Transfer office, Date Awarded: 1/10/19

Technology Transfer Activities None

**SYSTEM INNOVATION AND QUALITY IMPROVEMENT ACTIVITIES** None

**ORGANIZATIONAL ACTIVITIES**

Institutional Administrative Appointments None

Editorial Activities

Editorial Board Appointments None

Journal Peer Review Activities

- Cancer Epidemiology, Biomarkers and Prevention
- Cancer Research
- Cancer Immunology Research
- Clinical Cancer Research
- Cancer Immunology and Immunotherapy
- Cell and Bioscience
- Journal of Clinical Investigation
- Journal of Biomedical Science
- Journal of Virology
- Journal of Immunology
- Journal of Immunotherapy
- Proceeds of the National Academy Science
- Human Gene Therapy
- Molecular Therapy
- Gene Therapy
- Immunotherapy
- OncImmunology
- Blood
- Vaccine
- Virology

Other peer review activities      None

#### Advisory Committees, Review Groups/Study Sections

2005            Member, Grant review for Alliance for Cancer Gene Therapy  
2005-2006      Member, NIH Virology Study Section  
2006            Member, Grant review for Austrian Science Fund  
2008            Member, Grant review for Alliance for Cancer Gene Therapy  
2010            Member, NIH Molecular Oncology – Basic, Translational and Clinical Studies P01  
2010            Member, NIH SPORE in Gynecologic, Breast and Skin Cancers  
2011            Member, NIH Molecular Oncology –Clinical Studies Special Emphasis Panel review NCI P01  
2011            Member, NIH SPORE in Gynecologic, Breast and Skin Cancers  
2013-2017      Member, NIH R03/R21 study section in immunology and immunotherapy  
2015            Member, NIH SPORE in Gynecologic, Breast and Prostate Cancers  
2015            Member, DOD Ovarian Cancer Research Program, Clinical Translational Research  
2018            Member, NIH RO1 Mammalian Models for Translational Research Study Section  
2019            Member, NIH SPORE in Head Neck Cancers  
2020            Member, NIH SPORE in Ovarian and Breast Cancers

#### Professional Societies

1998-present    American Association for Cancer Research  
2002-present    Society for Immunotherapy of Cancer

Conference Organizer    None

Session Chair            None

Consultantships         None

#### RECOGNITION

##### Awards, Honors

2005            Alliance for Cancer Gene Therapy Young Investigator Award  
2006            Flight Attendant Medical Research Institute Award  
2007            American Cancer Society Research Scholar Award  
2017            Elected Member, National Academy of Inventors

##### Invited Talks

###### JHMI/Regional

2009            Virotherapy and Immunotherapy for Ovarian Cancer, Pathology Grand Rounds, Johns Hopkins University School of Medicine, Baltimore MD  
2009            Vaccines for Ovarian Cancer, 2009 Biennial Meeting of the Johns Hopkins Medical and Surgical Association, Baltimore MD  
2014            Mark cancer cells for CTL attack through coating with viral antigenic peptides CTLs kill tumor with viral peptides, Immunology summit, Baltimore MD  
2019            Integration of Oncogenes via Sleeping Beauty as a Mouse Model of HPV16(+) Oral Tumors and Immunologic Control, International Conference on Cancer Research and Drug Development, Baltimore

###### National

2002            Improving Vaccine Potency through Enhanced Intercellular Spreading and MHC Class I Presentation of Antigen, Keystone Symposia Gene-Based Vaccines, Breckenridge, CO  
2003            Enhancing MHC Class I Antigen Presentation by Targeting Antigen to Centrosomes, American Society of Gene therapy Annual Meeting, Washington, DC  
2003            Targeting an Antigen into the Centrosome to Enhance DNA Vaccine Potency, American Society for Cell Biology, San Francisco, CA  
2004            Enhancing DNA Vaccine Potency by Combining a Strategy to Prolong Dendritic Cell Life with Intracellular Targeting Strategies, Rational Design of Vaccines and Immunotherapeutics, Keystone, CO  
2004            Development of HPV Human T cell- Mediated Immunological Assays, 8th International Conference on Malignancies in AIDS and Other Immunodeficiencies (ICMAOD): Basic, Epidemiologic and Clinical Research, Bethesda, MD  
2006            Identification of Mechanisms for Tumor Immune Evasion, Wayne State University, Detroit, MI

- 2006 Modifying Professional Antigen Presenting Cells to Enhance DNA Vaccine Potency, Society of Chinese Bioscientists in America, Washington, DC
- 2006 HPV Immunotherapeutic Vaccines in pre-clinical model and HPV human Immunological Assays, Gynecologic Oncology Group Semi-Annual Symposium 2006, Bethesda, MD
- 2009 Vaccines for Ovarian Cancer, 2010 Gynecologic Cancer SPORE meeting, DC
- 2009 Cluster intradermal DNA vaccination rapidly induces E7-specific CD8+ T-cell immune responses leading to therapeutic antitumor effects, 2009 NCI Translational Science Meeting, DC
- 2011 Control of Cervicovaginal HPV-16 E7-Expressing Tumors by the Combination of Therapeutic HPV Vaccination and Vascular Disrupting Agents, NCI Translational Science Meeting, DC
- 2012 Tumor-targeted delivery of IL-2 by NKG2D leads to accumulation of antigen-specific CD8+ T cells in the tumor loci and enhanced anti-tumor effects, American Society gene and Cell Therapy Annual meeting, Philadelphia, PA
- 2016 Innovative strategies to control ovarian cancer, Department of Oncology, Karmanos Cancer Institute, Detroit, MI
- 2016 Targeted coating with antigenic peptide renders tumor cells susceptible to CD8(+) T cell-mediated killing, SPORE Workshop on Translational Research in Ovarian Cancer, DC
- 2018 Spontaneous and Vaccine-Induced Clearance of Mus Musculus Papillomavirus 1 Infection, NCI Oncology Model Forum Annual Meeting, San Francisco, CA
- 2018 Innovative immunotherapies to treat cancers, 26th Annual Congress on Cancer Science and Targeted Therapies, San Francisco, CA
- International
- 2002 DNA vaccines for cervical cancer, HPV Vaccine Symposium, National Taiwan University, Taiwan
- 2002 Improving DNA Vaccine Potency via Modification of Professional Antigen Presenting Cells, DNA Vaccine Symposium, Edinburgh, UK
- 2007 HPV vaccines, Mackay Memorial Hospital, Taipei, Taiwan
- 2007 Ovarian cancer vaccine, 19th Federation of Asian and Oceanian Biochemists and Molecular Biologists Conference, Washington, DC
- 2008 Cancer immunotherapy using irradiated tumor cells secreting heat shock protein 70, 2nd International Conference on Ovarian Cancer, Rhodes, Greece.
- 2009 Chemotherapy and Immunotherapy for Ovarian Cancer, The 14th Taiwan Joint Cancer Conference & 8th Cross-Strait Academic Conference on Oncology, Taiwan
- 2009 Chemotherapy and Immunotherapy for Cervical Cancer, Mackay Memorial Hospital, Taipei, Taiwan
- 2009 Vaccines for Cervical Cancer, Taipei Veteran General Hospital, Taiwan
- 2009 DNA vaccine, Cancer vaccines adjuvants & delivery systems, Dublin, Ireland
- 2015 Novel chemotherapy for ovarian cancer RPN13/ADRM1 inhibitor reverses immunosuppression by myeloid derived suppressor cells, International Symposium on Cancer Research in Mackay Memorial Hospital, Taipei, Taiwan
- 2015 Innovative strategies to control ovarian cancer, Taipei Medical School Joint Symposium on Cancer, Taipei, Taiwan
- 2016 Immunostimulation by chemotherapy in ovarian cancers, Henan Gynecologic Oncology Conf, China
- 2016 Immunostimulation by chemotherapy in ovarian cancers, Shanghai 10th People Hospital's Symposium, China
- 2017 Targeted coating with antigenic peptide renders tumor cells susceptible to CD8(+) T cell-mediated killing, The 10th Anniversary of Protein & Peptide Conference, Fukuoka, Japan
- 2018 Innovative immunotherapies to treat gynecologic cancers, 21st International Symposium on Molecular Medicine, Bangkok, Thailand
- 2018 Innovative immunotherapies to treat cancers, MacKay Memorial Hospital, Taipei, Taiwan
- 2018 Intramuscular vaccination targeting mucosal tumor draining lymph node enhances integrins-mediated CD8+ T Cell infiltration to control mucosal tumor growth, 31st Annual Congress on Vaccines, Clinical Trials, Vancouver, Canada
- 2019 Therapeutic Vaccines for HPV Associated Cancer, International Conference on Women's Cancer, Mackay Memorial Hospital, Taipei, Taiwan