

June 2014

CURRICULUM VITAE

T.-C. Wu, M.D., Ph.D.

DEMOGRAPHIC INFORMATION

Current Academic and Hospital Appointments:

Professor of Pathology, The Johns Hopkins University School of Medicine
Professor of Oncology, The Johns Hopkins University School of Medicine
Professor of Obstetrics and Gynecology, The Johns Hopkins University School of Medicine
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Research Director of Gynecologic Pathology
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Education:

9/75-7/82 M.D., National Taiwan University
College of Medicine

7/84-5/85 M.P.H., Epidemiology
The Johns Hopkins University
School of Hygiene and Public Health

6/85-5/89 Ph.D., Molecular Virology
The Johns Hopkins University
School of Hygiene and Public Health
Dissertation Topic: Transcriptional regulatory elements in
the non-coding region of human papillomavirus type 6.

Training:

- 7/89-6/90 Intern
Anatomic Pathology
Department of Pathology
The Johns Hopkins Hospital
Baltimore, Maryland
- 7/90-6/92 Resident
Anatomic Pathology
Department of Pathology
The Johns Hopkins Hospital
- 7/92-6/95 Clinical Fellow
Division of Gynecologic Pathology
Department of Pathology
The Johns Hopkins Hospital
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Professional Experience:

- June 1995 - Present Pathologist
The Johns Hopkins Hospital, Surgical Pathology
Sign-out specimens from Gynecologic Pathology
- June 1995 - June 1997 Assistant Professor of Pathology
The Johns Hopkins University School of Medicine
- October 1996-July 1997 Assistant Professor of Oncology
The Johns Hopkins University School of Medicine
- December 1996-July 1997 Assistant Professor of Molecular Microbiology and Immunology
The Johns Hopkins University,
School of Hygiene and Public Health
- July 1997-October 1997 Assistant Professor of Obstetrics and Gynecology
The Johns Hopkins University School of Medicine
- July 1997 – July 2003 Associate Professor of Pathology
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- July 1997 – July 2003 Associate Professor of Oncology
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- Oct. 1997 – July 2003 Associate Professor of Obstetrics and Gynecology
The Johns Hopkins University School of Medicine
- July 2003 – present Professor of Pathology, Oncology, Obstetrics and Gynecology, and
Molecular Microbiology and Immunology
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RESEARCH ACTIVITIES

Publications:

Peer-Reviewed Scientific Articles:

- 1) J.M. McDonnell, P.J. McDonnell, P. Mounts, **T.-C. Wu**, and R. Green. (1986) Demonstration of papillomavirus capsid antigen in human conjunctival neoplasia. Arch of Ophthalmol. 104: 1801-1805.
- 2) H. Kashima, **T.-C. Wu**, P. Mounts, D. Heffner, A. Cachay, and V. Hyams. (1988) Carcinoma ex-papilloma: Histologic and virologic studies in whole-organ sections of the larynx. Laryngoscope. 98(6pt1): 619-624.
- 3) **T.-C. Wu**, and P. Mounts. (1988) Transcriptional regulatory elements in the noncoding region of human papillomavirus type 6. J. Virol. 62(12): 4722-4729.
- 4) **T.-C. Wu**, and P. Mounts. (1989) Sensitive detection of human papillomavirus nucleic acid and proteins in biopsy specimens of respiratory and genital tract papillomata. J. Virol. Meth. 25: 31-47.
- 5) **T.-C. Wu**, R.B. Mann, P. Charache, S.D. Hayward, S. Staal, B.C. Lambe and R.F. Ambinder. (1990) Detection of EBV gene expression in Reed-Sternberg cells of Hodgkin's disease. Int. J. Cancer. 46(5): 801-804.
- 6) R.H. Hruban, **T.-C. Wu**, W.E. Beschorner, D.E. Cameron, R.F. Ambinder, W.A. Baumgartner, B.A. Reitz, G.M. Hutchins. (1990) Cytomegalovirus nucleic acids in allografted hearts. Hum Pathol. 21(9): 981-983.
- 7) J.S. Park, J.S. Rader, **T.-C. Wu**, L.A. Laimins, J.L. Currie, R.J. Kurman, and K.V. Shah. (1991) HPV-16 viral transcripts in vulvar neoplasia; preliminary studies. Gynecol Oncol. 42(3): 250-255.
- 8) **T.-C. Wu**, R.B. Mann, J. Epstein, E. MacMahon, W.A. Lee, P. Charache, S.D. Hayward, R.J. Kurman, G.S. Hayward, and R.F. Ambinder. (1991). Abundant expression of EBER1 small nuclear RNA in nasopharyngeal carcinoma: A morphologically distinctive target for detection of Epstein-Barr virus in formalin-fixed paraffin-embedded carcinoma specimens. Am. J. Pathol. 138(6):1461-1469.
- 9) **T.-C. Wu**, M.D. Kanayama, R.H. Hruban, W-C Au, F.B. Askin, and G.M. Hutchins. (1992). Virus Associated RNAs (VA-I and VA-II): An efficient target for the detection of adenovirus infections by in situ hybridization. Am. J. Pathol. 140(4): 991-998.
- 10) **T.-C. Wu**, R.H. Hruban, R.F. Ambinder, M. Pizzorno, D.E. Cameron, W.A. Baumgartner, B.A. Reitz, G.S. Hayward, and G.M. Hutchins. (1992). Demonstration of cytomegalovirus nucleic acids in the coronary arteries of transplanted hearts. Am. J. Pathol. 140(3): 739-747.

- 11) R.B. Mann, **T.-C. Wu**, R.F. Ambinder. (1992). *In situ* localization of EBV in thymic carcinoma. *Mod. Pathol.* 5(4): 363-366.
- 12) **T.-C. Wu**, W.A. Lee, M. Pizzorno, W-C Au, R.H. Hruban, R.F. Ambinder, S.D. Hayward, G.M. Hutchins, and G.S. Hayward. (1992) Localization of the human cytomegalovirus (HCMV) 2.7-kb major early (beta) gene transcripts by in situ hybridization in permissive and non-permissive infections. *Am. J. Pathol.* 141(5): 1247-1254.
- 13) **T.-C. Wu**, M.C. Pizzorno, G.S. Hayward, S. Willoughby, D.A. Neumann, N.R. Rose, A.A. Ansari, K.L. Baughman, and A. Herskowitz. (1992). In situ detection of human cytomegalovirus immediate early gene (IE) transcripts within cardiac myocytes of patients with HIV-associated cardiomyopathy. *AIDS.* 6(8): 777-785.
- 14) H.K. Kashima, T. Kessis, R.H. Hruban, **T.-C. Wu**, J. Zinreich, and K.V Shah. (1992) Human papillomavirus in sinonasal papillomas and squamous cell carcinoma. *Laryngoscope* 102(9): 973-976.
- 15) **T.-C. Wu**, and T.-T. Kuo. (1993). Study of Epstein-Barr virus early RNA (EBER1) expression by in situ hybridization in thymic epithelial tumors of Chinese patients in Taiwan. *Hum Pathol.* 24(3): 235-238.
- 16) **T.-C. Wu**, M.D. Kanayama, R.H. Hruban, W. Whitehead, and M.B.K. Raj. (1993) Detection of neuron specific 9.0-kb transcript which share homology with antisense transcript of HIV gag gene from patients with and without HIV-1 infection. *Am. J. Pathol.* 142(1): 25-31.
- 17) **T.-C. Wu**, J.M. Trujillo, H.K. Kashima and P. Mounts. (1993) Association of human papillomavirus and nasal neoplasia. *Lancet.* 341(8844): 522-524.
- 18) A. Herskowitz, S. Willoughby, **T.-C. Wu**, W.E. Beschorner, D.A. Neumann, N.R. Rose, K.L. Baughman, and A.A. Ansari. (1993) Immunopathogenesis of HIV-1-Associated Cardiomyopathy. *Clin. Immunol. Immunopathol.* 68(2): 234-241.
- 19) M.M. Oliva, **T.-C. Wu** and V.W. Yang. (1993) Isolation and characterization of a differentiation-dependent gene in the human colonic cell line HT29-18. *Arch. Biochem. Biophys.* 302(1): 183-192.
- 20) L.D. Walensky, D.S. Coffey, T.-H. Chen, **T.-C. Wu**, and G.R. Pasternack. (1993) A novel M(r) 32,000 nuclear phosphoprotein is selectively expressed in cells competent for self-renewal. *Cancer Res.* 53(19), 4720-4726.
- 21) J.A. DiGiuseppe, **T.-C. Wu**, and R.L. Corio. (1994) Analysis of Epstein-Barr virus-encoded small RNA 1 expression in benign lymphoepithelial salivary gland lesions. *Mod. Pathol.* 7(5): 555-559.

- 22) S. Hall, **T.-C. Wu**, N. Soudi, M.E. Sherman. (1994) Low-grade squamous intraepithelial lesions: Cytologic predictors of biopsy confirmation. *Diagn. Cytopathol.* 10(1): 3-9.
- 23) L. Hedrick, K.R. Cho, E.R. Fearon, **T.-C. Wu**, K.W. Kinzler, and B. Vogelstein. (1994) The DCC gene product in cellular differentiation and colorectal tumorigenesis. *Genes Dev.* 8(10): 1174-1183.
- 24) A. Herskowitz, **T.-C. Wu**, S.B. Willoughby, D.A. Vlahov, A. Ahmed-Ansari, W.E. Beschoner and K.L. Baughman. (1994) Myocarditis and cardiotropic viral infection associated with severe left ventricular dysfunction in late stage infection with human immunodeficiency virus. *J. Am Coll Cardiol.* 24(4): 1025-32.
- 25) E. M. Burke, D. L. Karp, **T.-C. Wu**, and R. L. Corio. (1994) Atypical oral presentation of herpes simplex virus infection in a patient after orthotopic liver transplantation. *Eur Arch Otorhinolaryngol.* 251(5): 301-303.
- 26) J.A. DiGiuseppe, **T.-C. Wu**, B.A. Zehnbauer, P.R. McDowell, J.M. Barletta, R.F. Ambinder, and R.B. Mann. (1995) Epstein-Barr virus and progression of Non-Hodgkin's lymphoma to KI-1-positive, anaplastic large cell phenotype. *Mod. Pathol.* 8(5): 553-559.
- 27) **T.-C. Wu**, Y. Ling, M.D. Kanayama, A.Y. Huang and R.J. Kurman. (1995) Localization of Epstein-Barr Virus-Encoded small RNA-1 (EBER-1) by in situ reverse transcription: Demonstration of cDNA generation in tissue sections. *J. Biomed. Sci.* 2(3): 249-255.
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- 31) K.-L. Liaw, A.W. Hsing, C.-J. Chen, M.H. Schiffman, T.Y. Zhang, C.-Y. Hsieh, C.E. Greer, S.-L. You, T.W. Huang, **T.-C. Wu**, T.J. O'Leary, J. Seidman, W.J. Blot, C.L. Meinert, M.M. Manos. (1995) Human papillomavirus and cervical neoplasia: A case-control study in Taiwan. *Int. J. Cancer* 62: 565-571.
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- 33) I.O. Baas, J.A. Offerhaus, W.S.El-Deiry, **T.-C. Wu**, G.M. Hutchins, E.K. Kasper, K.L. Baughman, W.A. Baumgartner, C.-J. Chiou, G.S. Hayward, and R.H. Hruban. (1996) The WAF1-mediated p53 growth-suppressor pathway is distinct in the coronary arteries of heart transplant recipients. *Hum. Pathol.* 27(4): 324-329.
- 34) J.M. Trujillo, **T.-C. Wu**, and P. Mounts. (1996) Characterization of human papillomavirus type 57b: Transforming activity and comparative sequence analysis as probes for biological determinants associated with high-risk oncogenic viruses. *Virus Genes.* 12(2): 165-178.
- 35) A.W. Hsing, R.D. Burk; K.-L. Liaw, C.-J.Chen, M.H. Schiffman,T.Y. Zhang,C.E. Greer,S.-L. You, C.-Y. Hsing, T.W. Huang, **T.-C. Wu**, T.J. O'Leary, J. D. Seidman, and M. Manos. (1996) Interlaboratory agreement in a PCR-based human papillomavirus DNA assay. *Cancer Epidemiol. Biomarkers Prev.* 5(6): 483-484.
- 36) A.G. Ramos-Soriano, J.M. Saavedra, **T.-C. Wu**, R.A. Livinggston, R.A. Henderson, J.A. Perman, R.H. Yolken. (1996) Enteric pathogens associated with gastrointestinal dysfunction in children with HIV infection. *Mol. Cell Probes.* 10(2): 67-73.
- 37) **T.-C. Wu**, D.A. Fuentes-Bernardo, Y.-J. Chan, W.-C. Au, C.-J. Chiou, W.M. Fox III, R.H. Hruban, G.S. Hayward, and R.J. Kurman. (1997) Detection of the human cytomegalovirus (HCMV) 2.0 kb immediate early gene transcripts in permissive and non-permissive infections by RNA in situ hybridization. *J. Biomed. Sci.* 4(1): 19-27.
- 38) Y.T. Jin, S.T. Tsai, C.Li, K.C. Chang, J.J. Yan, W.Y. Chao, H.L. Eng, T.Y. Chou, **T.-C. Wu**, and I.J. Su. (1997) Prevalence of human papillomavirus in middle ear carcinoma associated with chronic otitis media. *Am. J. Pathology* 150(4): 1327-1333.
- 39) D.E. Mold, **T.-C. Wu**, F. Askin, and R.C.C. Huang. (1997) Four classes of HERV-K long terminal repeats and their relative promoter strengths for transcription. *J Biomed. Sci,* 4(2-3): 78-82.
- 40) **T.-C. Wu**, S.-T. Hsieh, B. W. Purow, and R. J. Kurman. (1997) Demonstration of human papillomavirus (HPV) genomic amplification and viral-like particles from CaSki cell line in SCID mice. *J.Virol. Methods.* 65(2): 287-298.
- 41) K.-Y. Lin, W.H. Westra, H.K. Kashima, P. Mounts, and **T.-C. Wu**. (1997) Coinfection of HPV-11 and HPV-16 in a case of squamous laryngeal papilloma with severe dysplasia. *Laryngoscope.* 107(7): 942-947.
- 42) A. Lafond-Walker, C.-L. Chen, S. Augustine, **T.-C. Wu**, R.H. Hruban, and C.J. Lowenstein (1997) Inducible nitric oxide synthase expression in coronary arteries of transplanted human hearts with accelerated graft arteriosclerosis. *American J. Pathology* 151(4): 919-925.
- 43) K. Vu, D.L. Greenspan, **T.-C. Wu**, H.A. Zacur, R.J. Kurman. (1997) Cellular proliferation, estrogen receptor, progesterone receptor, and bcl-2 expression in GnRH agonist treated uterine leiomyomas. *Hum. Pathol.* 29(4): 359-363.

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- 45) H. Ji, E.Y. Chang, K.-Y. Lin, R.J. Kurman, D.M. Pardoll, and **T.-C. Wu**. (1998) Antigen specific immunotherapy for murine lung metastatic tumors expressing HPV-16 E7 oncoprotein. *Int. J. Cancer.* 78(1): 41-45.
- 46) C.-C. Huang, J.-T. Qiu, M.L. Kashima, R.J. Kurman, and **T.-C. Wu**. (1998) Generation of type-specific probes for the detection of single-copy human papillomavirus by a novel in situ hybridization method. *Mod. Pathol.* 11(10): 971-977.
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- 48) C.-C. Huang, M.L. Kashima, H. Chen, I.-M. Shih, R.J. Kurman, and T.-C. Wu. (1999) HPV in situ hybridization with catalyzed signal amplification and polymerase chain reaction in establishing cerebellar metastasis of cervical carcinoma. *Hum. Pathol.* 30(5): 587-591.
- 49) A. Rashid, **T.-C. Wu**, C.C. Huang, C.-H. Chen, H.Z. Lin, S.Q. Yang, F.Y.J. Lee, and A.M. Diehl. (1999) Mitochondrial proteins that regulate apoptosis and necrosis are induced in mouse fatty liver. *Hepatology*, 29: 1131-1138.
- 50) H. Ji, T.-L. Wang, C.-H. Chen, S.I. Pai, C.-F. Hung, K.-Y. Lin, R. J. Kurman, D. M. Pardoll, and **T.-C. Wu**. (1999) Targeting HPV-16 E7 to the endosomal/lysosomal compartment enhances the antitumor immunity of DNA vaccines against murine HPV-16 E7-expressing tumors. *Hum. Gene Ther.* 10(17): 2727-2740.
- 51) C.-H. Chen, H. Ji, K. W. Suh, M. A. Choti, D. M. Pardoll and **T.-C. Wu**. (1999) Gene gun-mediated DNA vaccination induces antitumor immunity against human papillomavirus type 16 E7-expressing murine tumor metastases in the liver and lungs. *Gene Therapy*, 6(12): 1972-1981.
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- 53) C.-H. Chen, T.-L. Wang, C.-F. Hung, Y. Yang, H. Chen, R. A. Young, D. M. Pardoll and **T.-C. Wu**. (2000) Enhancement of DNA vaccine potency by linkage of antigen gene to an HSP70 gene. *Cancer Research*, 60(4):1035-1042.

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- 59) S.A. Leachman, R.E. Tigelaar, M. Ahylankevich, M.D. Slade, M. Irwin, E. Chang, **T.-C. Wu,** W. Xiao, S. Pazhani, D. Zelterman and J. L. Brandsma. (2000) GM-CSF priming plus papillomavirus E6 DNA vaccination: effects on papilloma formation and regression in the CRPV-rabbit model. *J. Virol.* 74(18): 8700-8708.
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- 67) W.-F. Cheng, C.-F. Hung, C.-Y. Chai, K.-F. Hsu, L. He, M. Ling and **T.-C. Wu.** (2001) Enhancing sindbis virus self-replicating RNA vaccine potency by linkage of herpes simplex virus type 1(HSV-1) VP22 protein to antigen. *J Virol.* 75(5): 2368-2376.
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Inventions and Patents:

1. US.Patent number: 6,734,173
Title: Fusion of Heat shock protein 70 to antigens enhance the potency of DNA vaccines

Issue Date: 02/099/2000

Investigators: Tzyy-Choou Wu, Chien-Fu Hung

Status: licensed.

2. Australia Patent number : 784605
Title: Fusion of Heat shock protein 70 to antigens enhance the potency of DNA vaccines
Issue Date: 10/10/2000
Investigators: Tzyy-Choou Wu, Chien-Fu Hung
Status: licensed.
3. European Patent number: 1,222,289
Title: Fusion of Heat shock protein 70 to antigens enhance the potency of DNA vaccines
Issue Date: 10/20/2000
Investigators: Tzyy-Choou Wu, Chien-Fu Hung
Status: licensed.
4. Japan Patent number : 5,087,201
Title: Fusion of Calreticulin to antigens enhance the potency of DNA vaccines
Issue Date: 08/02/2001
Investigators: Tzyy-Choou Wu, Chien-Fu Hung
Status: licensed.
5. US Patent number : 7,342,002, 8,007,781
Title: Fusion of Calreticulin to antigens enhance the potency of DNA vaccines
Issue Date: 08/04/2003; 01/15/2008
Investigators: Tzyy-Choou Wu, Chien-Fu Hung
Status: Licensed.
6. US Patent number : 7,318,928
Title: Enhancement of Nucleic Acid Vaccine Potency by Intercellular Spreading and
Enhancement of MHC Class I Presentation of Antigen Linked to Herpesvirus VP22 Protein
Issue Date: 08/08/2003
Investigators: Tzyy-Choou Wu, Chien-Fu Hung
Status: under exclusive optioned-licensed agreement.
7. US Patent number : 8,128,922
Title: Cancer Immunotherapy using a DNA Vaccine Encoding the Translocation Domain of a
Bacterial Toxin Linked to a Tumor Antigen
Issue Date: 04/04/2002
Investigators: Tzyy-Choou Wu, Chien-Fu Hung
Status: under exclusive option-licensed agreement.
8. US Patent number : 7,557,200
Title: Enhancement of Suicidal DNA Vaccine Potency by Linkage Mycobacterium
Tuberculosis Heat Shock Protein 70 to an Antigen
Issue Date: 03/05/2004

Investigators: Tzyy-Choou Wu, Chien-Fu Hung
Status: available from Hopkins Tech Transfer office

9. US Patent number : 8,137,908
Title: Development of Mesothelin-Specific Cancer Immunotherapy Using an Ascitogenic Ovarian/Peritoneal Tumor Model
Issue Date: 09/15/2008
Investigators: Tzyy-Choou Wu, Chien-Fu Hung, Ralph Hruban, Elizabeth Jaffee
Status: licensed.
10. US Patent number : 10/555,669
Title: Antitumor Effects Generated by pNGVL4a-Sig/E7 (detox)/HSP70 DNA Vaccine Administered Through Gene Gun, Biojector and Syringe
Issue Date: Pending
Investigators: Tzyy-Choou Wu, Chien-Fu Hung
Status: licensed.
11. US Patent number : 11/773,162
Title: Modification of Professional Antigen-Presenting Cells with Small Interfering RNA (siRNA) Targeting BAK and/or BAX Can Enhance DNA Vaccine Potency
Issue Date: Pending
Investigators: Tzyy-Choou Wu, Chien-Fu Hung
Status: available from Hopkins Tech Transfer office
12. US Patent number : 12/438,300
Title: Epigallocatechin-3-Gallate (EGCG) Enhances CD8+ T Cell Mediated Anti-Tumor Immunity Induced by DNA Vaccination
Issue Date: Pending
Investigators: Tzyy-Choou Wu, Chien-Fu Hung
Status: available from Hopkins Tech Transfer office
13. US Patent number : 12/043,656
Title: Administration of DNA Vaccines with DNA Encoding Ii-PADRE Generates Potent PADRE-specific CD4+ T-cell Immune Responses and Enhances Vaccine Potency
Issue Date: Pending
Investigators: Tzyy-Choou Wu, Chien-Fu Hung
Status: available from Hopkins Tech Transfer office
14. US Patent number : 12/049,763
Title: Control of Human Mesothelin-expressing Tumors By DNA Vaccines
Issue Date: 03/17/2008
Investigators: Tzyy-Choou Wu, Ralph Hruban, Chien-Fu Hung, Elizabeth Jaffee
Status: licensed.
15. US Patent number : 12/049,596
Title: Generation and Characterization of a Preventive and Therapeutic HPV DNA Vaccine

Issue Date: Pending
Investigators: Tzyy-Choou Wu, Richard Roden, Chien-Fu Hung
Status: under exclusive option-licensed agreement

16. US Patent number : 13/495,436
Title: Cancer Immunotherapy Using Irradiated Tumor Cells Secreting Hsp 70
Issue Date: Pending
Investigators: Tzyy-Choou Wu, Chien-Fu Hung
Status: available from Hopkins Tech Transfer office
17. Japan Patent number : 12/508,648
Title: Combination of Viral Oncolysis and Tumor-specific Immunity to Control Established Tumors
Issue Date: Pending
Investigators: Tzyy-Choou Wu, Chien-Fu Hung
Status: under exclusive option-licensed agreement
18. US Patent number : 13/318,028
Title: Combination of Viral Oncolysis and Tumor-specific Immunity to Control Established Tumors
Issue Date: Pending
Investigators: Tzyy-Choou Wu, Chien-Fu Hung
Status: under exclusive option-licensed agreement
19. Brazil Patent number : PI1011902-7
Title: Combination of Viral Oncolysis and Tumor-specific Immunity to Control Established Tumors
Issue Date: Pending
Investigators: Tzyy-Choou Wu, Chien-Fu Hung
Status: under exclusive option-licensed agreement
20. Canada Patent number : 2,760,310
Title: Combination of Viral Oncolysis and Tumor-specific Immunity to Control Established Tumors
Issue Date: Pending
Investigators: Tzyy-Choou Wu, Chien-Fu Hung
Status: under exclusive option-licensed agreement
21. Australia Patent number : 2010246273
Title: Combination of Viral Oncolysis and Tumor-specific Immunity to Control Established Tumors
Issue Date: Pending
Investigators: Tzyy-Choou Wu, Chien-Fu Hung
Status: under exclusive option-licensed agreement
22. European Patent number : 10772568.1

June 2014

Title: Combination of Viral Oncolysis and Tumor-specific Immunity to Control Established Tumors

Issue Date: Pending

Investigators: Tzyy-Chou Wu, Chien-Fu Hung

Status: under exclusive option-licensed agreement

23. US Patent number : 13/338,889

Title: Delivery of DNA Vaccines Using Human Papillomavirus Pseudovirions

Issue Date: Pending

Investigators: Tzyy-Chou Wu, Chien-Fu Hung, Richard Roden

Status: available from Hopkins Tech Transfer office

24. US Patent number : 61/701,094

Title: Selectively Targeted Coating of Tumor Cells with Foreign Antigenic Peptide Renders Tumor Cells Susceptible to Antigen-specific CD8+ T Cell-mediated Killing

Issue Date: Pending

Investigators: Tzyy-Chou Wu, Chien-Fu Hung

Status: available from Hopkins Tech Transfer office

25. US Patent number : 61/731,225; 61/776,123

Title: Innovative HDAC Inhibitor Enhances E7-specific CD8+ T-cell Mediated Antitumor Immunity Induced by DNA Vaccine

Issue Date: Pending

Investigators: Tzyy-Chou Wu, Chien-Fu Hung

Status: under exclusive option-licensed agreement

26. US Patent number : 61/862,768

Title: 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

Issue Date: Pending

Investigators: Tzyy-Chou Wu, Chien-Fu Hung, Richard Roden

Status: under exclusive option-licensed agreement.

Extramural Sponsorship:

A) Current Support :

Program Director: T.-C. Wu

Source and Identification Number: NIH/NCI 2P50CA098252-11

Title: SPORE in Cervical Cancer.

Role on project: SPORE Director, Co-Principal Investigator on Project 2, Project 5 and Administrative/Communication Core

Dates: 09/01/14 – 08/31/19

June 2014

Project 2	\$92,800	5% Effort
Project 5	\$91,658	10% Effort
Core A	\$ 120,729	5% Effort
Career Development Project	\$ 82,251	2.5% Effort
Dev. Research Project	\$89,502	2.5% Effort

The Overall goal is to reduce the incidence of cervical cancer in the next 5 years by improving treatment outcomes in patients with HPV-associated cervical cancer and its precursor lesions, and protecting the next generation of women from oncogenic HPV infection and its sequelae using an interdisciplinary team of investigators."

Program Director: T.-C. Wu

Source and Identification Number: 1P20 CA192988-01

Title: 2/2-Howard University/Johns Hopkins Partnership in HPV - Related Cancer Research

Role: Program Director, Project 1 Co-Leader

Dates: 10/01/14- 09/30/18

Annual Direct Costs: \$137,500 15% Effort

The goal of this study is to aid in the expansion and development of a collaborative effort shared between Howard University and Johns Hopkins University Investigators to develop molecular biologic and immunologic expertise in the Howard research community in the study of human papilloma virus related head and neck cancers.

Principal Investigator: T.-C. Wu

Source and Identification Number: NIH/NCI 1 RO1 CA114425-06

Title: Enhancing HPV-16 E6/E7-specific antitumor immunity.

Role on project: Principal Investigator

Dates: 09/01/12 - 08/31/17

Annual Direct Costs: \$176,030 15% Effort

Specific Aims of project: The major goal of this project is to generate and characterize HPV-16 E6 & E7 specific DNA vaccine and compare their therapeutic effects in a murine E6/E7-expressing tumor models.

Principal Investigator: T.-C. Wu

Source and Identification Number: NIH 1R21 CA178255-01A1

Title: Upregulation of Nanog as an Innovative Mechanism for Cancer Drug Resistance.

Role on project: Principal Investigator

Dates: 04/01/14 – 03/31/16

Annual Direct Costs: \$130,500 10% Effort

Specific Aims of project: To characterize the role of Nanog, a transcription factor involved in the self-renewal of pluripotent stem cells, in the escape of tumors from host immune defenses. This study aims to establish that immune escape and drug resistance in cancer emerge through a central pathway orchestrated by Nanog.

Principal Investigator: T.-C. Wu

Source and Identification Number: NIH R01CA183040-01

Title: Ovarian Cancer Gene Therapy Using HPV Pseudovirion.

June 2014

Role on project: Principal Investigator

Dates: 05/01/14 – 04/30/2019

Annual Direct Costs: \$250,000 20% Effort

Specific Aims of project: To use HPV pseudovirions to facilitate the targeted delivery of an innovative chimeric protein that will coat both infected and uninfected tumor cells with a common foreign viral epitope as well as the Fc portion of the immunoglobulin G to induce adaptive and innate immune responses respectively to control ovarian tumors.

Principal Investigator: William Nelson

Source and identifying No.: NIH/NCI P30CA006973

Title: Regional Oncology Research Center Oncology Center Support Grant

Role on project: Co-investigator

Dates: 05/01/12-04/30/17

Annual Direct Costs: \$6,883,282 5% Effort

Specific Aims of project: To serve as a senior mentor for juvenile investigators in the Cancer Center and to team up with clinicians to generate relevant preclinical data for further clinical translation.

B) Previous Awarded Grants:

Program Director: David Sidransky

Source and Identification Number: NIH/NCI P50 DE019032

Title: Head & Neck Cancer SPORE.

Role on project: Co-PI of Project 4

Dates: 08/13/2012- 07/31/2017

Annual Direct Costs: \$200,000 10% Effort

HPV Vaccine and Correlates of Response

Specific Aims of project: To evaluate the safety/toxicity of combining cyclophosphamide and the CRT/E7 DNA Vaccine after completion of chemoradiation therapy to patients with HPV-Associated head and neck cancer.

Program Director: T.-C. Wu

Source and Identification Number: NIH/NCI 2 P50 CA098252

Title: SPORE in Cervical Cancer.

Role on project: SPORE Director, Co-Principal Investigator on Project III, Project IV and Administrative/Communication Core

Dates: 09/30/09-08/31/14

Annual Direct Costs:

Project III \$169,200 10% Effort

Project IV \$232,914 10% Effort

Administrative Core A \$127,512 5% Effort

Career Dev. Administration \$79,870 2% Effort

Dev. Research Program \$84,740 2% Effort

June 2014

Specific Aims of project: To bring together a interdisciplinary team of investigators who are dedicated to translational research of cervical cancer and to have impact on the screening, diagnosis, prevention and treatment of cervical cancer in 5 years.

Principal Investigator: Richard Roden

Source and Identification Number: V Foundation for Cancer Research

Title: Treatment of Head & Neck Cancer w/HPV Vaccine.

Role on project: Co-Investigator

Dates: 11/01/2011-10/31/2014

Annual Direct Costs: \$180,000 5% Effort

Specific Aims of project: To perform clinical trials using a chimeric HPV vaccine TA-CIN in patients with HPV-16 positive head and neck cancer or HPV-16 positive vulvar intraepithelial neoplasia.

Program Director: David Sidransky

Source and identifying No.: NIH/NCI 2 P50 CA96784-06

Title: Brain, Head & Neck, Lymphoma & Prostate Cancer Spores.

Role on project: Co-Principal Investigator on project 3.

Effort- 8%

Dates and costs of entire project: 09/01/07 - 08/31/12 Direct: \$ 1,250,000

Dates and costs of current year: 09/01/07 - 08/31/08 Direct: \$ 250,000

Specific aims of project: To perform HPV vaccine clinical trials and correlate immune responses with clinical outcome in patients with advanced head and neck squamous cell carcinoma.

Principal Investigator: T.-C. Wu

Source and identifying No.: Melanoma Research Alliance \M08110545099

Title: Treatment of melanoma combining cancer gene therapy and immunotherapy

Role on project: Principal Investigator

Effort- 10%

Dates and costs of entire project: 06/01/2009-05/31/2012 Direct: \$ 225,000

Specific Aims: Development of innovative gene therapy for the control of melanoma in a preclinical model.

Principal Investigator: T.-C. Wu

Source and identifying No.: NIH/NCI 5R21AI085380-02

Title: Laser treatment to enhance therapeutic HPV DNA vaccine potency

Role on project: Principal Investigator

Effort- 10%

Dates and costs of entire project: 06/01/2011-05/31/2012 Direct: \$ 213,471

Specific Aims: To determine if intradermal administration of the therapeutic HPV DNA vaccine via injection or gene gun followed by femtosecond laser beam treatment would significantly enhance the transfection efficiency of the DNA vaccine resulting in enhanced HPV antigen-specific T cell-mediated immune responses and antitumor effects in vivo.

Program Director: Elizabeth M. Jaffee

Source and identifying No.: NCI/NCDDG 1U19 CA113341-01

June 2014

Title: mesothelin-specific ovarian cancer vaccines
Role on project: Principal Investigator of project 2.
Effort-15%

Dates and costs of entire project: 05/01/05-04/30/10 Direct: \$ 750,000

Dates and costs of current year: 05/01/05 - 04/30/06 Direct: \$150,000

Specific aims of project: The major goal of this project is to generate an mesothelin-specific DNA vaccine as a therapeutic cancer vaccine for mesothelin-expressing ovarian cancers.

Principal Investigator: T.-C. Wu

Source and identifying No.: NIH/NCI 1 RO1 CA114425-01

Title: Enhancing HPV-16 E6-specific antitumor immunity

Role on project: Principal Investigator.

Effort-20%

Dates and costs of entire project: 04/01/05 - 03/31/10 Direct: \$ 1,250,000

Dates and costs of current year: 04/01/05 - 03/31/06 Direct: \$ 250,000

Specific aims of project: The major goal of this project is to generate and characterize HPV-16 E6 specific DNA vaccine and compare their therapeutic effects in a murine E6-expressing tumor models.

Principal Investigator: T.-C. Wu

Source and identifying No.: NIH/NIAID 1 UO1 AI070346-01

Title: Development of Optimized/Adjuvanted Smallpox DNA Vaccine (Gene Gun)

Role on project: Principal Investigator.

Effort-15%

Dates and costs of entire project: 04/01/06 - 03/31/10 Direct: \$ 1,200,133

Dates and costs of current year: 04/01/06 - 03/31/07 Direct: \$ 250,000

Specific aims of project: The major goal of this project is to develop an optimized smallpox DNA targeting 4 poxvirus antigen using gene gun in a nonhuman primate model.

Program Director: Joseph Califano

Source and identifying No.: NIH/NCI P20 MI/CCP

Title: HU/JHU Head and Neck Cancer Translational Research and Education Program

Role on project: Co-Investigator.

Effort-7%

Dates and costs of entire project: 12/01/05 - 11/30/09 Direct: \$ 522,954

Dates and costs of current year: 12/01/05 - 11/30/06 Direct: \$ 125,000

Specific aims of project: The major goal of this proposal is to create a collaborative environment to enhance translational research and education related to head and neck cancer at the Howard University Medical Institutions through a highly collaborative effort between the Howard University Medical Institutions and the Head and Neck Cancer Center at the Johns Hopkins Medical Institutions.

Program Director: T.-C. Wu

Source and identifying No.: NIH/NCI 1 P50 CA098252-01

Title: SPORE in Cervical Cancer.

June 2014

Role on project: SPORE director, Co-Principal Investigator on project 5 and 6 and Administrative/Communication Core

Effort- 30%

Dates and costs of entire project: 09/30/03 - 8/31/08 Direct: \$ 9,726,689

Dates and costs of current year: 09/30/03 - 8/31/04 Direct: \$ 1,822,700

Specific aims of project: To bring together a interdisciplinary team of investigators who are dedicated to translational research of cervical cancer and to have impact on the screening, diagnosis, prevention and treatment of cervical cancer in 5 years.

Program Director: Keerti Shah

Source and identifying No.: NIH NIAID IPO1A13458201

Title: Protective immunological mechanisms against STD

Role on project: Co-Investigator

Effort-15%

Dates and costs of entire project: 09/01/93 - 08/31/98 Direct: 471,101

Dates and costs of current year: 09/01/97 - 08/31/98 Direct: 80, 300

Specific aims of project: T cell responses to HPV oncoproteins in cervical cancer

Program Director: Robert Siliciano

Source and identifying No.: NIH NIAID PO1 A137934-01

Title: Novel strategies for enhancing antigen processing and presentation

Role on project: Co-Investigator.

Effort-15%

Dates and costs of entire project: 04/01/95 - 03/31/99 Direct: 244,633

Dates and costs of current year: 04/01/97 - 03/31/98 Direct: 57,725

Specific aims of project: *In vivo* targeting of antigen to antigen presenting cells

Program Director: Drew M. Pardoll

Source and identifying No.: NIH NCDDG RFA CA-95-020

Title: Antigen specific vaccines for breast and cervical cancers.

Role on project: Principal Investigator.

Effort- 30%

Dates and costs of entire project: 09/01/96 - 08/31/00 Direct: \$ 475,421

Dates and costs of current year: 09/01/97 - 08/31/98 Direct: \$ 111,957

Specific aims of project: To develop and compare antigen specific cancer vaccines for breast and cervical cancers using adenoviral, vaccinia and Listeria vectors.

Principal Investigator: T.-C. Wu

Source and identifying No.: ACS IM-83156

Title: Novel strategies to enhance antigen specific cancer immunotherapy.

Your role on project: Principal Investigator.

Effort- 30%

Dates and costs of entire project: 01/01/97 - 12/31/99 Direct: \$ 313,304

Dates and costs of current year: 01/01/97 - 12/31/97 Direct: \$ 100,089

Specific aims of project: To generate E7 specific antitumor immunity using vaccinia vector and to explore the mechanisms of antitumor immunity using cytokine knockout mice.

June 2014

Principal Investigator: Shau-Ku Huang

Source and identifying No.: NIH/NIAID RFA AI-95011

Title: Mucosal gene transfer in murine airway allergic response

Role on project: Co-Investigator.

Effort-3%

Dates and costs of entire project: 12/01/96 - 07/31/01 Direct: \$ 485,319

Dates and costs of current year: 08/01/98 - 07/31/99 Direct: \$ 112,492

Specific aims of project: The goal of this project is to determine the role of IFN-gamma in the regulation of Ag-induced airway inflammation and bronchial hyperactivity by transfer of IFN-gamma genes directly into the lung mucosal cells.

Program Director. Fred Sanfilippo

Source and identifying No.: NIH/NHLBI

Title: Mechanisms of accelerated graft arteriosclerosis.

Role on project: Co-Investigator.

Effort-10%

Dates and costs of entire project: 05/01/97-04/30/01. Direct: \$ 983,857

Dates and costs of current year: 05/01/99-04/30/00. Direct: \$ 181,365

Specific aims of project: To identify the mechanisms by which various etiologic risk factors contribute to AGA, and based on these findings, to define appropriate therapeutic methods to treat or prevent AGA.

Principal Investigator: T.-C. Wu

Source and identifying No.: NIH/NCI 1R01CA72631-01

Title: Enhancement of HPV-16 E6 & E7-specific antitumor immunity.

Role on project: Principal Investigator.

Effort- 25%

Dates and costs of entire project: 01/01/97 - 12/31/01 Direct: \$ 574,263

Dates and costs of current year: 01/01/01 - 12/31/01 Direct: \$ 95,663

Specific aims of project: To generate E6 and E7 chimeric proteins and to enhance E6 and E7 specific immunity using vaccinia vector.

Principal Investigator: T.-C. Wu

Source and identifying No.: Cancer Research Institute

Title: Development of T cell-mediated immunological assays for human papillomavirus vaccines

Role on project: Principal Investigator.

Effort-10%

Dates and costs of entire project: 12/15/98 - 12/14/01 Direct: \$ 299,502

Dates and costs of current year: 12/15/00 - 12/14/01 Direct: \$ 99,505

Specific aims of project: The major goal of this project is to develop and utilize assays to measure T cell-mediated immune responses in patients vaccinated with HPV vaccines.

Principal Investigator: T.-C. Wu

Source and identifying No.: American Cancer Society RSG-01-079-01-LIB

Title: Antigen Specific Cancer Immunotherapy Using Self-Replicating RNA Vaccines

June 2014

Role on project: Principal Investigator.

Effort-20%

Dates and costs of entire project: 01/01/01 - 12/31/03 Direct: \$ 447,000

Dates and costs of current year: 01/01/01 - 12/31/01 Direct: \$ 117,947

Specific aims of project: The major goal of this project is to generate and characterize a self-replicating Semliki Forest Virus RNA replicon containing various chimeric HPV-16 E7 gene and compare their therapeutic effects in a murine E7-expressing tumor models.

Principal Investigator: T.-C. Wu

Source and identifying No.: NIH/NCI 1 RO1 CA83706-01

Title: Preventive/Therapeutic HPV Vaccine Development

Role on project: Principal Investigator.

Effort-10%

Dates and costs of entire project: 12/01/99 - 11/30/03 Direct: \$ 907,779

Dates and costs of current year: 12/01/00 - 11/30/01 Direct: \$ 170,633

Specific aims of project: The major goal of this project is to generate and characterize HPV-16 pseudovirion containing a therapeutic DNA vaccine and compare their therapeutic effects in a murine E7-expressing tumor models.

Principal Investigator: T.-C. Wu

Source and identifying No.: Genencor International, Inc.

Title: Intracellular Targeting Strategies to Enhance DNA Vaccine Potency

Role on project: Principal Investigator.

Effort-1%

Dates and costs of entire project: 01/01/02 - 12/31/03 Direct: \$ 632,000

Dates and costs of current year: 01/01/02 - 12/31/02 Direct: \$ 315,188

Specific aims of project: The major goal of this sponsored research is to identify the best intracellular targeting strategy to enhance DNA vaccine potency.

Program Director: T.-C. Wu

Source and identifying No.: NIH/NIAID 1P01AI48203-01

Title: Human immune responses for HPV vaccines

Role on project: Principal Investigator of the program and project 2.

Effort-25%

Dates and costs of entire project: 07/01/00 - 06/30/04 Direct: \$ 2,592,939

Dates and costs of current year: 07/01/01 - 06/30/02 Direct: \$ 487,774

Specific aims of project: The major goal of this project is to develop and utilize assays to measure humoral and cell-mediated immune responses in patients vaccinated with HPV vaccines.

Program Director: Elizabeth M. Jaffee

Source and identifying No.: NCI/NCDDG 5 U19 CA72108

Title: HER-2/neu-specific pseudovirion cancer vaccines

Role on project: Principal Investigator of project 3.

Effort-10%

Dates and costs of entire project: 07/01/00-06/30/04 Direct: \$ 543,331

Dates and costs of current year: 07/01/01 - 06/30/02 Direct: \$129,652

June 2014

Specific aims of project: The major goal of this project is to generate an HPV-16 {pCMV HER-2/neu} pseudovirion as a therapeutic cancer vaccine for HER-2/neu-expressing breast cancers.

Principal Investigator: T.-C. Wu

Source and identifying No.: NCI/RAID Program (NSC#723254)

Title: Production of DNA Vaccine Encoding Chimeric E7/HSP70 for the Treatment of HPV-Associated Head and Neck Squamous Cell Carcinoma.

Role on project: Principal Investigator of the program

Effort-N/A

Dates and costs of entire project: \$50,000 for preclinical test and expense for GMP grade reagent

Dates and costs of current year: \$50,000 for preclinical test and expense for GMP grade reagent

Specific aims of project: The major goal of this project is to generate and characterize a clinical GMP grade pNGVL4a-Sig/E7(detox)/HSP70 DNA vaccine for the Phase I trial on patients with HPV-associated advanced head and neck squamous cell carcinoma.

Principal Investigator: T.-C. Wu

Source and identifying No.: NCI/RAID Program (NSC#727107)

Title: Production of DNA Vaccine Encoding Calreticulin (CRT) Linked to HPV-16 E7 for the Treatment of HPV-Associated Advanced Cervical Cancer.

Role on project: Principal Investigator.

Effort-N/A

Dates and costs of entire project: N/A

Dates and costs of current year: N/A

Specific aims of project: The major goal of this project is to generate and characterize a clinical GMP grade pNGVL4a-CRT/E7(detox) DNA vaccine for the Phase I trial on patients with HPV-associated advanced cervical cancers.

Program Director: Robert J. Kurman

Source and identifying No.: Department of Defense

Title: Development of antigen-specific cancer vaccines for the control of ovarian cancer

Role on project: Principal Investigator of project 3.

Effort-10%

Dates and costs of entire project: 07/01/02 - 06/30/05 Direct: \$ 489,942

Dates and costs of current year: 07/01/02 - 06/30/03 Direct: \$ 163,314

Specific aims of project: The major goal of this proposal is to generate an innovative antigen-specific nucleic acid vaccine using intercellular spreading strategy to control ovarian cancers.

EDUCATIONAL ACTIVITIES

Teaching:

Classroom Instruction:

- 1) Unit Director (Gyn/Breast/Prostate) of Pathobiology and Disease Mechanisms Course, 2002, 2003, 2004, 2005 (JHU, School of Medicine)
- 2) Lecture in the Second Year Pathology Course for second year medical students on "Pathology of the cervix". 2002, 2007, 2008, 2009, 2010, 2011 (JHU, School of Medicine).

- 3) Lecture in the Second Year Pathology Course for second year medical students on “Pathology of the vulva and vagina”. 2002, 2007, 2008, 2009, 2010, 2011 (JHU, School of Medicine).
- 4) Coordinate and teach the Gynecology Pathology section for medical students in the Second Year Pathology Laboratory. 1998-2005 (JHU, School of Medicine).
- 5) Teach virology and bacteriology for medical students in the Second Year Pathology Laboratory. 1999-2007 (JHU, School of Medicine).
- 6) Lecture in Pathobiology Course for graduate students on “Preclinical model for vaccine development”. 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011 (JHU, School of Medicine).
- 7) Lecture in the Immunology Graduate Program Journal Club Series for graduate students on “New strategies for vaccine development”. 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014 (JHU, School of Medicine).
- 8) Lecture in Graduate Immunology for graduate students on “Tumor immunology”. 2001 (JHU, School of Hygiene and Public Health).
- 9) Lecture in “Principle of Virology” for graduate students on “Carcinogenesis and human papillomavirus”. 2001 (JHU, School of Hygiene and Public Health).
- 10) Lecture in “Advanced Virology” for graduate students on “Human papillomavirus and Oncogenesis” 2002, 2003 (JHU, School of Hygiene and Public Health).
- 11) Lecture in “Viral Oncology” for graduate students on “Human papillomavirus and Oncogenesis” 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014 (JHU, School of Medicine).
- 12) Lecture in “Biologic Basis of Vaccine Development” for graduate students on “Cancer Vaccines” 2003 (JHU, School of Hygiene and Public Health).

Clinical Instruction:

- 1) Teaching Gynecology and Pathology residents at Gynecology teaching conferences.
- 2) Teaching Gynecology and Pathology residents to use the multiheaded microscope.
- 3) Teaching in the Emil Novak Memorial Course on “HPV vaccine development”. 2000 (5th Richard W. TeLinde Lecture).

Other Instruction:

Lecture in *A Woman's Journey* series on “Cancer Vaccines”, 2000 (a community education series sponsored by the Johns Hopkins Medical Institutions).

Mentoring (pre and post-doctoral):

Undergraduate Students:

Edwin Y. Chang (1996-1998; Hopkins undergraduate student; he became a medical student at the University of Michigan, School of Medicine)

Stephen Brian Chiang (1996; Hopkins undergraduate student; He became a medical student at the University of Illinois, School of Medicine)

Sunny Young (1996; Hopkins undergraduate student; won the 1996 Provost's Undergraduate Research Award; He became a dental student at UCLA)

Howard Jen (1998, 1999 summer; Hopkins undergraduate student; He became a medical student at University of Maryland School of Medicine)

- Morris Ling (1999-present; Hopkins undergraduate student; won the 2000 Provost's Undergraduate Research Award; He became a medical student at University of Maryland School of Medicine)
- Thu Pham (1999, 2000 summer; Hopkins undergraduate student; won the 2000 Howard Hughes Undergraduate Research Award; She became a medical student at the University of Pennsylvania School of Medicine)
- Leigh Slater (1999-2001, Hopkins undergraduate student; She became a medical student at Emory University School of Medicine)
- Amit N. Vora (2001 spring; Hopkins undergraduate student; recipient of the Woodrow Wilson Undergraduate Research Fellowship; He became a medical student at Johns Hopkins University School of Medicine)
- Jeremy Juang (2001; Hopkins undergraduate student; recipient of the 2001 Provost's Undergraduate Research Award; currently a M.D., Ph.D. student at Stanford University)
- Michelle Moniz (2001-2006; Undergraduate student at Hopkins; recipient of the Woodrow Wilson Undergraduate Research Fellowship; She became a medical student at Washington University School of Medicine)
- Elizabeth Dzeng (2002 summers; Stanford undergraduate; She became a medical student at Johns Hopkins University School of Medicine)
- Marissa Morales (2006 summer; College of Notre Dame undergraduate; She became a graduate student at the California Institute of Technology)
- Barbara Ma (2006-2011; undergraduate and graduate student at Hopkins; She became a medical student at New York Medical College)
- Chih-Ping Mao (2006-2009; undergraduate student at Hopkins; He became a M.D.-PhD. student at Johns Hopkins University School of Medicine)
- Shaw-Wei David Tsen (2006-2009; undergraduate student at Hopkins; He became a M.D.-PhD student at University of Washington, St. Louis)
- Yijie (Angela) Xu (2009-present; undergraduate student at Hopkins)
- Ellen Margaret Axenfeld (2011 summer, undergraduate student at University of Miami)
- Janson Trieu (2011-present, undergraduate student at Hopkins)
- Alice Tao (2013, summer undergraduate student at Hopkins)
- Anita Patel (2013, summer undergraduate student at Hopkins)
- Ariel Yeh (2013, undergraduate student at Hopkins)
- Emily Robitschek (2014-present, undergraduate student at Colorado State University)

Medical Students:

- Masahide Kanayama, M.D. (1992, Medical Student from University of Wisconsin, School of Medicine; currently, an Assistant Professor in the Department of Obstetrics and Gynecology at the Mount Sinai Hospital in New York)
- Anthony L. Lee, M.D. (1992; Medical Student at Hopkins; currently, a fifth year resident in the Department of Surgery at the University of Michigan Medical Center)
- Maciej Lesniak, M.D. (1995; Medical Student at Hopkins; currently, a fifth year resident in the Department of Neurosurgery at the Johns Hopkins Hospital)
- Stefanie L. Stevenson, M.D. (1997, Medical student at Hopkins; currently, a third year resident in the Department of Medicine at the University of Cincinnati Medical Center)

Nazanin Hanjani (1999 summer; currently, former Medical student at Hopkins)
Todd T. Tomson (2004 summer; former Medical student at Hopkins)
Elizabeth Scotney (2009, summer, medical student at Imperial College School of Medicine, UK)
Kimberley Doolan (2009, summer, medical student at Imperial College School of Medicine, UK)
Elena Roosinovich (2009, summer, medical student at Imperial College School of Medicine, UK)
Anjui Wu (2009, summer, medical student at National Taiwan University)
Jeffrey Chang (2009, summer, medical student at National Taiwan University)
Cheng-Che (Sam) Chou (2009, summer, medical student at Chang Gung University)
Tsung Ju (Leon) Lee (2009, summer, medical student at Chang Gung University)
Joseph Wan (2009, summer, medical student at Chang Gung University)
Wei-Hung Weng (2009, summer, medical student at Chang Gung University)
Bin-Chi (Bill) Wu (2009, summer, medical student at Fu-Ren University School of Medicine)
Clarence Lin (2009, summer, medical student at Howard University)
Ray Mao (2010, winter, medical student at National Chang Kung University)
Candice Chang (2011, summer, medical student at Chang Gung University)
Yu-Han (Grace) Hsueh (2011, summer, medical student at National Chang Kung University)
Shu-yu Liu (2011, summer, medical student at National Chang Kung University)
Wen Han (Hans) Hsieh (2011, summer, medical student at National Taiwan University)
Philip Chiang (2013, summer, medical student at National Taiwan University)
Andrew Yang (2013, summer, medical student at National Taiwan University)

Graduate Students:

Ken-Yu Lin, (B.C.M.B. Graduate Program; recipient of the 2000 Howard Hughes Graduate Student Research Award; He completed a Ph.D. thesis on the mechanisms of tumor immune evasion in Dr. Wu's lab, He is currently a resident at Yale University affiliated hospital)
Bruce Huang (Pathobiology Graduate Program, He completed a Ph.D. thesis on the mechanisms of tumor metastasis in Dr. Wu's lab and is currently a fellow in National Cancer Institute.)
Jesse Rowley (Immunology Graduate Program, He completed a Ph.D. thesis on the T cell biology in Dr. Wu's lab and is currently a research fellow at the University of Utah).
Jian-Tai Qiu (Molecular Microbiology and Immunology Graduate Program, rotating student)
Cecily Alcock (Immunology Graduate Program, rotating student)
Sasha Klevytska (Pathobiology Graduate Program, rotating student)
Yan Zheng (Immunology Graduate Program, rotating student)
Stina Fengmark (Pathobiology Graduate Program, rotating student)
Yen-Chun Liu (Pathobiology Graduate Program, rotating student)
Andrew (Hung-Chih) Yang (Immunology Graduate Program, rotating student)
Chuan-Hsiang Huang (Immunology Graduate Program, rotating student)
Sophie Lin (Pathobiology Graduate Program, rotating student)
Tong Zhang (Immunology Graduate Program, graduated December 2010)
Huang Yu Yang (Immunology Graduate Program, rotating student).
Pei-Yang (Phillip) Hsu (Masters student, Johns Hopkins School of Public Health)
Chiaki Nakata (Masters student, Johns Hopkins School of Public Health)
Waipan Chan (2008, Immunology Graduate Program, rotating student)
Christopher Nirschl (2010, Immunology Graduate Program, rotating student)
Chao-Yi Wu (Pathobiology Graduate Program, completed her Ph.D. thesis in Dr. Wu's lab in 2013)

Residents:

Matthew L. Kashima, M.D. (1998 January-1998 July; currently, an Assistant Professor in the Department of Otolaryngology Head and Neck Surgery of the Johns Hopkins Bayview Medical Center)

Sara I. Pai, M.D., Ph.D. (June 2004-July 2007; currently, an Associate Professor in the Department of Otolaryngology Head and Neck Surgery of the Johns Hopkins Hospital)

Post-Doctoral Fellows:

Teh-Ying Chou, M.D., Ph.D. (1995-1996; Post-doctoral Fellow; currently, a professor in the Department of Pathology at the Veterans General Hospital in Taiwan)

C.-C. Huang, M.D. (1997-1998; post-doctoral fellow; currently, an attending pathologist and Associate Professor in Chang-Gung Memorial Hospital in Taiwan)

Hongxiu Ji, M.D., Ph.D. (1996-1998; post-doctoral fellow; currently, an Assistant Professor in the Department of Pathology at the Johns Hopkins Hospital)

Chien-Hung Chen, M.D. (1998-1999; post-doctoral fellow; currently, an Associate Professor in the Department of Medicine at National Taiwan University Hospital)

Mingxin Che, M.D., Ph.D. (1998-1999; postdoctoral fellow; currently, an Assistant Professor at Wayne State Hospital, Detroit)

Chien-Fu Hung, Ph.D. (1998-2000; postdoctoral fellow; currently, an Associate Professor in the Division of Gynecologic Pathology of the Johns Hopkins Hospital)

Wen-Fang Cheng, M.D. (1999-2001; postdoctoral fellow; currently, a Professor in the Department of Obstetrics and Gynecology at the National Taiwan University Hospital)

Keng-Fu Hsu, M.D. (1999-2000; postdoctoral fellow; currently, an Assistant Professor in the Department of Obstetrics and Gynecology of the National Cheng Kung University Hospital)

Chai Chee-Yin, M.D., Ph.D. (1999-2000; postdoctoral fellow; currently, Chairman of the Department of Pathology at the Kaohsiung Medical University, Taiwan)

Chia-Ling Hsieh, M.D. (2000-2002, postdoctoral fellow; currently, an attending physician at the Chang-Gung Memorial Hospital in Taiwan)

Jeong Won Kim, M.D., Ph.D. (2001-2002, postdoctoral fellow; currently, an Assistant Professor in the Department of Internal Medicine at the Dankook University Medical Center in South Korea)

Cheng-Tao Lin, M.D. (2001-2003, postdoctoral fellow, currently, an Associate Professor in Department of Obstetrics and Gynecology of the Chang-Gung Memorial Hospital in Taiwan)

Tae Woo Kim, Ph.D. (2001-2003, postdoctoral fellow, Currently, an Associate Professor at the Korea University in South Korea)

Dae Jin Kim, M.D., Ph.D. (2005-present, postdoctoral fellow, Department of Pathology of the Johns Hopkins Hospital. He is currently an Assistant Professor in the Chung-Ang University, South Korea.)

Dan Lu, Ph.D. (2006-present, postdoctoral fellow, Department of Pathology of the Johns Hopkins Hospital.)

Chih-Long Chang, M.D., Ph.D. (2006- present, postdoctoral fellow, Department of Pathology of the Johns Hopkins Hospital. He is currently an Assistant Professor at Mackay Memorial Hospital, Taipei, Taiwan.)

- Chi-Mu Chuang, M.D. (2006- present, postdoctoral fellow, Department of Pathology of the Johns Hopkins Hospital. He is currently an Assistant Professor at National Yang-Ming University, Taipei, Taiwan)
- Chih-Wen Tseng, M.D. (2006-2008, postdoctoral fellow, Department of Pathology of the Johns Hopkins Hospital. He is currently an Assistant Professor at Chang Gung University College of Medicine, Taiwan)
- Tae Heung Kang, Ph.D. (2008-present, postdoctoral fellow, Department of Pathology of the Johns Hopkins Hospital)
- Yuqian Zhang, Ph.D. (2008-2009, postdoctoral fellow, Department of Pathology of the Johns Hopkins Hospital)
- Weiting Hsueh, Ph.D. (2009-2010, postdoctoral fellow, Department of Pathology of the Johns Hopkins Hospital)
- Qi Zeng, M.D. (2008-2010, postdoctoral fellow, Department of Pathology of the Johns Hopkins Hospital)
- Wen-Chung Chen, M.D. (2009-2010, postdoctoral fellow, Department of Pathology of the Johns Hopkins Hospital)
- An-Jen Chiang, M.D. (2010-2011, postdoctoral fellow, Department of Pathology of the Johns Hopkins Hospital)
- Bianca Gomez, Ph.D. (2010-present, postdoctoral fellow, Department of Pathology of the Johns Hopkins Hospital)
- Sharon Tsai, M.D. (2010-present, postdoctoral fellow, Department of Pathology of the Johns Hopkins Hospital)
- Sung Yong Lee, Ph.D. (2011-present, postdoctoral fellow, Department of Pathology of the Johns Hopkins Hospital)
- Lihua Yang, M.D. (2011-2012, postdoctoral fellow, Department of Pathology of the Johns Hopkins Hospital)
- Ruey-Shyang Soong (2012-2014, postdoctoral fellow, Department of Pathology of the Johns Hopkins Hospital)
- Yun-Yan Sun, M.D. (2012-2014, postdoctoral fellow, Department of Pathology of the Johns Hopkins Hospital)
- Liwen Song, M.D. (2013-2014, postdoctoral fellow, Department of Pathology of the Johns Hopkins Hospital)
- Sung-Jong Lee, M.D. (2013-present, postdoctoral fellow, Department of Pathology of the Johns Hopkins Hospital)
- Jay Yang, M.D. (2013-present, postdoctoral fellow, Department of Pathology of the Johns Hopkins Hospital)
- Jian Miao, M.D. (2014-present, postdoctoral fellow, Department of Pathology of the Johns Hopkins Hospital)

Graduate Student Thesis Committees:

- Yue-Ming Huang (Molecular Microbiology and Immunology Graduate Program, M.S. Degree, 1999, Thesis Advisory Committee)

Shiwen Peng (Immunology Program at the University of Queensland, Australia, Ph.D. Degree, 1999, outside reviewer)

Jonathan Heller (Biochemistry Graduate Program, Ph.D. Degree, 2000, Thesis Advisory Committee)

Jie Yang (Molecular Pharmacology Graduate Program, Ph.D. Degree, 2001, oral examiner)

Haili Zhang (Immunology Graduate Program, Ph.D. Degree, 2001, oral examiner)

Gladys Tan (Immunology Graduate Program, Ph.D. Degree, 2001, oral examiner)

Rebecca Garten (Molecular Microbiology and Immunology Graduate Program, Ph.D. Degree, 2001, oral examiner)

Jian-Tai Qiu (Molecular Microbiology and Immunology Graduate Program, Ph.D. Degree, 2001, Thesis Advisory Committee)

Tian-Hong Wang (Immunology Graduate Program, Ph.D. Degree, 2001, Thesis Advisory Committee)

Lan Lin (Pharmacology Graduate Program, Ph.D. Degree, 2001, Thesis Advisory Committee)

George R. Gunn, III (Immunology Program at the University of Pennsylvania, Ph.D. Degree, 2001, outside reviewer)

Kai Wei Lin (Immunology program, Ph.D. Degree, 2002, oral examiner)

Loise Francisco (Immunology Program, Ph.D. Degree, 2002, oral examiner)

Kalpna Devaraj (Molecular Microbiology and Immunology Program, M.H.S. Degree, 2002, Thesis Advisory Committee)

Ruijiang Song (Biomedical Engineering Program, Ph.D. Degree, 2002, Chair of Thesis Advisory Committee)

Patti Gravitt (Epidemiology Graduate Program, Ph.D. Degree, 2002, Thesis Advisory Committee)

Phuong Thi Nguyen Sarkis (Molecular Microbiology and Immunology Graduate Program, Ph.D. Degree, 2003, oral examiner)

Kimberly Dowd (Immunology program, Ph.D. Degree, 2004, oral examiner)

James Thompson (Microbiology and Immunology Graduate Program of the University of Maryland at Baltimore County, Ph.D. Degree, 2006, Thesis Advisory Committee, 2005)

Nick Souders (Microbiology and Immunology Graduate Program of the University of Pennsylvania, Ph.D. Degree, 2006, Thesis Advisory Committee)

Rhonda Kines (Immunology Graduate Program of the Roswell Park Cancer Institute, Ph.D. Degree, 2005, Thesis Advisory Committee)

Zhaohui Ye (Immunology program, Ph.D. Degree, 2006, oral examiner)

Lukas W. Pfannenstiel (Immunology program, Ph.D. Degree, 2007, Thesis Advisory Committee).

Vivian Weiss (Immunology program, M.D., Ph.D. Degree, 2007, Thesis Advisory Committee).

Kelly Barrios-Marrugo (Immunology Program, Ph.D., 2012, Thesis Advisory Committee)

James Gordy (Immunology and Infectious disease Program, Ph.D., 2014, Thesis Advisory Committee)

Training grant participation:

1) Immunology Graduate Program Training Grant, 2001-present, trainer

2) Pathobiology Graduate Program Training Grant, 2000-present, trainer

- 3) NIH T32 STD Training Grant, 2001-present, member of the executive committee for laboratory research

Editorial Activities:

Editorial Board

- 2000-present member, Diagnostic Molecular Pathology
2004-present member, American Journal of Pathology
2004-present member, International Journal of Gynecological Pathology
2005-present Associate Editor, Journal of Biomedical Science
2008-2010 member, Gene Therapy
2009-present member, Cancer Research
2010-present Associate Editor, Cell and Bioscience

Journal peer review activities:

1. Journal of Biomedical Science
2. The Laryngoscope Journal
3. International Journal of Gynecological Pathology
4. Journal of the Society for Gynecologic Investigation
5. Cancer Research
6. Clinical Cancer Research
7. American Journal of Pathology
8. Expert Opinion on Investigational Drugs
9. Journal of Virology
10. Modern Pathology
11. The Lancet
12. Cancer Epidemiology, Biomarkers and Prevention
13. Human Pathology
14. Molecular Pathology
15. Journal of Immunology
16. Cancer Immunology and Immunotherapy
17. Virology
18. Human Gene Therapy
19. FASEB
20. Molecular Therapy
21. Gene Therapy
22. Blood
23. Journal of the National Cancer Institute
24. Nature Medicine
25. Immunity
26. Proc. Natl. Acad. Sci.
27. Journal of Clinical Investigation
28. Nature Biotechnology
29. Cancer Cell
30. Nature Reviews Cancer

CLINICAL ACTIVITIES

Certification:

1992 - present State of Maryland License
1992 American Board of Pathology,
 Certification in Anatomic Pathology

Service Responsibilities:

- a) Regularly sign out diagnostic GYN surgical pathology specimens.
- b) Participate in the development of new molecular diagnostic tests.
- c) Participate in the development of new molecular immunological assays.

ORGANIZATION ACTIVITIES

Institutional Administrative Appointments:

July 1996-present
 Member of the CAC Clinical Research and Development Subcommittee

February 1997
 Member of the Ad hoc Review Committee for Promotion to Assistant
 Professor

May 1999, October 2002
 Member of the Ad hoc Review Committee for Promotion to Associate
 Professor

October 2003, 2004
 Member of the Ad hoc Review Committee for Promotion to Professor

March 1998-present
 Member of the Subcommittee for the recruitment of M.D., Ph.D. residents

July 1997-present
 Member of the Research Committee of JHU Women's Health Initiatives

February 2002-January 2006
 Director of the Vaccine Immunology Basic Research Center

February 2002-present
 Director of the Cervical Cancer Steering Committee

August 2002-present
 Member of the Research Council of the Sidney Kimmel Comprehensive Cancer
 Center at Hopkins

February 2006-present

Member of the Subcommittee for Professor Promotion Committee

Professional Societies:

American Society for Clinical Investigation (ASCI)

American Association of Immunologists

Sigma Xi

Society of Chinese Bioscientists in America (SCBA)

Binford-Dammin Infectious Disease Society of International
Academy of Pathology

American Association for Cancer Research

International Society of Gynecological Pathologists

American Society of Gene Therapy

American Society for Microbiology

International Papillomavirus Society

Association of American Physicians (AAP)

Conference Organizer, Section Chair:

- 1) Organizer for the Fourth Annual Joint Scientific Symposium of NIH/FDA CAA and Washington DC Chapter of SCBA, August, 1997, Bethesda, Washington D.C.
- 2) Organizer for the Fifth Annual Joint Scientific Symposium of NIH/FDA CAA and Washington DC Chapter of SCBA, August, 1998, Bethesda, Washington D.C.
- 3) Moderator and member of the Program Committee for the Companion Meeting/Scientific Symposium of the Binford-Dammin Society of Infectious Disease Pathologists, International Academy of Pathology 2001, Atlanta, Georgia.
- 4) Chair for Immunology Section of the 19th International Papillomavirus Conference 2001, Florianopolis, Brazil.
- 5) Moderator and member of the Program Committee for the Companion Meeting/Scientific Symposium of the Binford-Dammin Society of Infectious Disease Pathologists, International Academy of Pathology 2002, Chicago, Illinois
- 6) Chair for AAI tumor immunology program "Anti-tumor Effector Cells and Regulation of Tumor Immunity" 2002, New Orleans, Louisiana
- 7) Chair and member of the Scientific Program Committee for Prophylactic Vaccines section of the 20th International Papillomavirus Conference 2002, Paris, France.
- 8) Chair and member of the Program Committee for the Companion Meeting/Scientific Symposium of the Binford-Dammin Society of Infectious Disease Pathologists, International Academy of Pathology 2003, Washington D.C.
- 9) Moderator and member of the Program Committee for the International Conference on Malignancies in AIDS and Other malignancies 2004, 2005, 2006, 2008, 2009, 2010, 2011, 2013 Washington DC.
- 10) Chair and member of the Scientific Program Committee for Immunology section of the 22th International Papillomavirus Conference 2005, Vancouver, Canada.
- 11) Chair for Vaccination against Cervical Cancer Session, AACR Frontiers in Cancer Prevention Research, 2006, Baltimore, MD

- 12) Members of the Planning Committee for the 13th SPORE Investigators' Workshop, 2005, Washington DC
- 13) Chair for Optimization of DNA vaccines by gene gun at the DNA Vaccine by Gene Gun Meeting at Magdalen College, 2006, Oxford England.
- 14) Chair for Vaccine and Antiviral Therapy Workshop of the 11th SCBA meeting, 2006, San Francisco, CA
- 15) Chair for the Break-Out session for the Head and Neck Cancer SPORE and Cervical Cancer SPORE program of the 2007 Annual SPORE meeting, Baltimore, MD
- 16) Chair for the Viral Oncology Workshop of the 2007 Annual SPORE meeting, Baltimore, MD
- 17) Chair and member of the Scientific Program Committee for Immunology section of the 24th International Papillomavirus Conference 2007, Beijing, China.
- 18) Member of the Scientific Program Committee for 3rd International Conference on Cancer Vaccines/Adjuvants/Delivery for the Next Decade, 2009, Dublin, Ireland.
- 19) Chair of Tumor Virology and Immunology session, BIT's 1st World Congress of Virus and Infections 2010 (WCVI-2010), Busan, South Korea
- 20) Chair of Molecular Pathology session, 7th Asia Pacific IAP Congress (May 20-24, 2011), Taipei, Taiwan
- 21) Chair of Antibodies for Ovarian and Lung Cancer session, BIT's 3rd Annual International Congress of Antibodies 2011, Beijing, China
- 22) Organizer and Chair of Tumor Immunology Session, 2011 SCBA annual meeting, Guangzhou, China
- 23) Member of the Scientific Program Committee for Immunology section of the 27th International Papillomavirus Conference 2011, Berlin, Germany.
- 24) Member of the Scientific Program Committee and Chair for Immunology section of the 28th International Papillomavirus Conference 2012, San Juan, Puerto Rico
- 25) Organizer and Chair of Immunology Session, 2013 SCBA annual meeting, Xian, China

Advisory Committee, Review Group:

1. Ad hoc member of NIH Experimental Immunology (EI) Study Section, 2000, 2001
2. Grant review for National Institute of Health, Taiwan, R.O.C., 2000
3. Grant review for National Science Foundation, USA, 2000
4. Grant review for South Carolina Research Initiative Grants, 2000
5. Grant review for Department of Veterans Affairs, 2000
6. Grant review for California Breast Cancer Research Program, 2000
7. Grant review for Dutch Cancer Society, 2000, 2001
8. Grant review for Austrian Science Fund, 2001
9. Grant review for the Ireland Health Research Board, 2001
10. Grant review for National Science Council, Taiwan, R.O.C., 2000, 2002
11. Grant review for American Institute of Biological Sciences / Flight Attendant Medical Research Institute, 2001, 2005 and 2006
12. Grant review for the Rapid Access to Preventive Investigational Development (RAPID) program, 2001, 2002

13. Grant review for the Research Grants Council of Hong Kong, 2002, 2008, 2009, 2011
14. Grant review for the Department of Defense, United States Government, 2002, 2003, 2004, 2005, 2006 and 2007
15. Member of the site visit committee to the Paterson Institute at Manchester, England, Cancer Research Campaign, 2002
16. Member of the site visit committee to the National Health Research Institutes of Taiwan for Center Development Grant, 2002, 2004
17. Member of NIH Experimental Immunology (EI) Study Section, 2002, 2003, 2004
18. Member of the site visit committee to program project (2PO1 CA078673-05) at Duke University, Durham, 2002, 2004.
19. Member of the site visit committee to Laboratory of Cellular Oncology (Drs. John Schiller and Douglas Lowy) at the National Cancer Institutes of the National Institutes of Health, Bethesda, Maryland, 2003
20. Grant review for head and neck cancer SPORE application, NCI, 2004.
21. Grant review for ovarian cancer SPORE application, NCI, 2004.
22. Grant review for the program project (2 P01 CA033049-22) Sloan-Kettering Institute for Cancer Research "Cellular Antibody Immunotherapy", 2004
23. Grant review for the program project (2P50 DC000203-20) N. Shore-Long Island Jew. Res. CRT "Studies of papillomas from the upper respiratory tract" 2004.
24. Member of the NCCR Scripps Research Institute of La Jolla, CA General Clinical Research Center Site Visit committee, CA, 2004.
25. Ad hoc member of the NIH Cancer Immunology and Immunotherapy (CII) Study Section, 2006, 2007
26. Member of the Cancer Immunopathology and Immunotherapy (CII) Study Section NCI/NIH (2008-2011)
27. Site Visit NIH CCR Site Visit (2010) Scientific Evaluation of the PI, Dr. Jeffrey. Schlom
28. Ad-hoc member of NCI Molecular Oncology P01 Review (2010)
29. Member of DOD Ovarian Cancer Study Section (2010, 2011, 2012, 2013)
30. National Research Program for Emergent Infectious Disease, National Science Council, Grant Review Committee, Taiwan (2008, 2009, 2011)
31. National Health Research Institutes Extramural Grant Scientific Review Committee, Taiwan, (2010, 2011, 2013, 2014)
32. National Research Program for Biopharmaceuticals, National Science Council, Grant Review, Taiwan (2011)
33. Member, NCI's Board of Scientific Counselors
34. Review for NIH Loan Repayment (2014)

Consultantships/Advisor:

1. Genecor, Scientific Advisory Board, 2004-2006
2. Cerus Corporation, Scientific Advisory Board, 2005-2007
3. Nventa Biopharmaceuticals Corporation, Scientific Advisory Board, 2007-2008
4. Science and Technology International® (STI), Scientific Advisory Board , 2007-2009
5. Member of External Advisory Committee of the Cell Stress and Biophysical Therapy Program at Roswell Park Cancer Institute (2006-2011).
6. Member, Scientific Advisory Board, Papivax Biotech Inc. (2013-2014)

RECOGNITION

Awards, honors:

National Taiwan University, College of Medicine

9/75-6/82 Book Award, 1975 through 1982 for being in top five percent of the class

1979 Dr. Shu Yeh Scholarship (best student in Pathology)

Johns Hopkins University, School of Hygiene & Public Health

1986-1988 The Hampil Fellowship (tuition and stipend support)

1987 The Frederick B. Bang Award (for an outstanding research idea in the area of pathobiology)

1989 The Delta Omega Honorary Society Alpha Chapter (in recognition of excellence in student research)

International Academy of Pathology

1994 Binford-Dammin Award (from Binford-Dammin society of International Academy of Pathology)

The Passano Foundation

1996 Passano Physician Scientist Award

Society of Chinese Bioscientists in America DC Chapter

2000 Outstanding Service Award

American Society for Clinical Investigation

2002 Elected member

The Chinese American Medical Society

2008 Scientific Award

The Association of American Physicians

2012 Elected member

Invited Talks, Panels:

1994 "Transcriptional activation of HPV by human cytomegalovirus (HCMV) and detection of HCMV immediate early transcripts in a subset of HPV containing condylomata." Invited speaker, University of Chicago, Pritzker Medical School, Illinois.

- 1994 "Development of vaccine and immunotherapeutic strategies for HPV related cervical carcinoma". Invited plenary speaker on "Modern developments in cancer therapeutics." American Association for Cancer Research, Academia Sinica, Taipei, Taiwan.
- 1996 "Application of intracellular sorting signals in the development of cancer vaccines." Invited speaker, Department of Biological Chemistry, The Johns Hopkins University, School of Medicine, Baltimore, Maryland.
- 1996 "Vaccinia vaccine vectors for cervical cancer." Invited speaker, Human Genetics Program, The Johns Hopkins University, School of Medicine, Baltimore, Maryland.
- 1996 "Antigen specific cancer immunotherapy for HPV-associated cervical cancers." Immunology Council, The Johns Hopkins University, Baltimore, Maryland.
- 1996 "Development of antigen specific cancer vaccines using intracellular sorting signals." Invited speaker, 15th International Papillomavirus Workshop, Brisbane, Australia.
- 1997 "Development of vaccines and immunotherapeutic strategies for HPV-related cervical Cancer." Chlamydia/STD Seminar Series. The Johns Hopkins Hospital, Baltimore, Maryland.
- 1997 "Novel strategy for antigen specific cancer immunotherapy." Invited speaker, Department of Molecular Microbiology and Immunology. The Johns Hopkins University, School of Hygiene and Public Health, Baltimore, Maryland.
- 1997 "Vaccine and immunotherapeutic strategies for HPV-associated neoplasms." Invited speaker, National Cancer Institute, National Institutes of Health, Bethesda, Maryland.
- 1997 "Antigen specific cancer immunotherapy." Invited speaker, Department of Microbiology and Immunology, Loyola University, Chicago
- 1997 "Development of vaccines and immunotherapeutic strategies for HPV-associated cervical cancers." Invited plenary speaker, 1st Annual Terry Fox and Chang-Gung Memorial Hospital International Cancer Symposium on Cervical Cancer, Taipei, Taiwan
- 1998 "Cervical cancer and HPV vaccines." Invited speaker, Department of Pathology, Medical College of Virginia, Richmond.
- 1998 "Antigen targeting to the MHC processing pathway." Invited plenary speaker, 1st Annual Meeting of The American Society of Gene Therapy, Seattle, Washington
- 1999 "Cancer immunotherapy for HPV-associated cervical cancers." Invited speaker, National Cancer Institute, National Institutes of Health, Baltimore, Maryland.
- 2000 "Development of preventive and therapeutic vaccines for HPV-associated cancers." Plenary speaker, American Association for Cancer Research, 91st Annual Meeting, San Francisco.
- 2000 "Development of vaccines and immunotherapeutic strategies for HPV-associated cervical cancers." Invited keynote speaker, The Joint Symposium of Oncology Research of Taiwan, Taipei, Taiwan.
- 2000 "Development of vaccines for HPV-associated cervical cancers." Invited speaker, Department of Immunology, H. Lee Moffitt Cancer Center, Tampa, Florida.
- 2001 "Preclinical model for cervical carcinogenesis." Invited plenary speaker, 1st International Conference on Cervical Cancer, Baltimore, Maryland.
- 2001 "Development of cervical cancer vaccines." Invited plenary speaker, the American Cancer Society's 43rd Annual Science Writers Seminar, Dana Point, California.
- 2001 "Novel strategies to enhance nucleic acid vaccine potency." Invited speaker, Ohio State University School of Medicine, Columbus, Ohio.
- 2001 "Preventive and therapeutic approaches toward HPV-associated neoplasia." Invited plenary speaker, HPV-2001 meeting, Taipei, Taiwan, R.O.C.

- 2001 “Development of vaccine and Immunotherapeutic strategies for HPV-associated cervical cancers.” Invited speaker, 21st Annual Resident’s Research Day, Lenox Hill Hospital, New York.
- 2001 “Vaccines and immunotherapeutic strategies for cancers.” Invited speaker, Department of Molecular & Cellular Biophysics, Roswell Park Cancer Institute, Buffalo, NY.
- 2001 “Preclinical model for cervical cancer.” Invited speaker, NIH/NCI Roundtable Discussion for Gynecological Cancer, Washington, DC.
- 2002 “Innovative DNA vaccines for HPV-associated malignancies.” Invited speaker, NIH/NCI RAID Program, Frederick, MD.
- 2002 “ Development of innovative DNA vaccines for the control of cancers.” Invited plenary speaker, 1st Taiwan-America Biotech Conference & Exhibition, San Diego, CA.
- 2002 “Improving DNA vaccine potency through intracellular and intercellular Targeting strategies.” Invited speaker, Hematopoiesis/Immunology Society, Department of Oncology, The Johns Hopkins University, Baltimore, MD.
- 2002 “Strategies to enhance DNA vaccine potency.” Invited plenary speaker, 2002 Advances in Designing Cancer Vaccines, Boston, MA.
- 2002 “DNA vaccines for cancer.” Invited speaker, The EORTC-AACR 2002 symposium on “Molecular Targets and Cancer Therapeutics”, Frankfurt, Germany.
- 2002 “Development of innovative DNA vaccines for cervical cancer.” Invited plenary speaker, 2nd International Conference on Cervical Cancer, MD Anderson, Houston, Texas.
- 2002 “Development of innovative strategies to enhance DNA vaccine potency.” Invited Speaker, Education Section for Transgene Immunology, 5th Annual Meeting of the American Society of Gene Therapy, Boston, MA
- 2002 “ Immunotherapy for gynecologic malignancies.” Invited plenary speaker, The Satellite Symposium “Management of recurrent gynecologic malignancies” for the 9th Biennial Meeting of the International Gynecologic Cancer Society, Taipei, Taiwan.
- 2002 “DNA vaccines for cancer.” Invited speaker, Surgery Branch of the National Cancer Institute, Washington, DC
- 2002 “Development of cell mediated immunological assays for HPV.” Invited speaker, DAIT Immunology Centers Meeting, NIAID/NIH, Washington, DC
- 2002 “Development of vaccines and immunotherapeutic strategies for HPV-associated cancers.” Invited speaker, Wayne State University Karmanos Cancer Institute, Detroit, MI.
- 2002 “Development of vaccines and immunotherapeutic strategies for HPV-associated cervical cancers.” Invited Speaker, Grand Round of USC Cancer Center, USC, Los Angeles, CA
- 2003 “DNA vaccines for antigen-specific cancer immunotherapy” Invited Speaker, Department of Immunology, Mayo Clinic and Mayo Graduate School, Rochester, MN.
- 2003 “Improving DNA vaccine potency via modification of professional antigen presenting cells” Invited Speaker, the 5th Annual Walker’s Cay Colloquium on Cancer Vaccines and Immunotherapy, Walker’s Cay, Bahamas.
- 2003 “DNA vaccines for cancer immunotherapy” Invited Speaker, Basic Science Seminar, Oncology Center, Loyola University, Chicago
- 2003 “DNA vaccines for HPV-associated malignancies: from Bench to Bed Side” Invited Speaker, The 27th Clinical Research Seminar, Department of Health, Taiwan
- 2003 “Development of HPV DNA vaccines for AIDS patients” Invited Speaker, the Seventh International Conference on Malignancies in AIDS and Other Immunodeficiencies: Basic, Epidemiologic and Clinical Research., Washington, DC.

- 2003 “Antigen processing and therapeutic vaccines” Invited Speaker, Women’s Interagency HIV Study mini symposium, Washington, DC.
- 2003 “Development of innovative DNA vaccines against SARS” Invited Speaker, DAIT Biodefense Meeting, NIAID/NIH, Washington, DC.
- 2003 “DNA vaccines for cancers” Invited Speaker, Pediatric AIDS Clinical Trials Group Meeting, NIAID/NIH, Washington, DC.
- 2004 “DNA vaccines for HPV-associated cancers” Invited Speaker, Grand Round, Department of Dermatology, The Johns Hopkins University, Baltimore, MD.
- 2004 “Development of human immunological assays for HPV vaccines” Invited Speaker, Head and Neck SPORE workshop, Georgetown, Washington DC.
- 2004 “ DNA vaccine for cervical cancer: from bench to bed site.” Invited speaker, First International Tumor Immunology Symposium, Seoul, South Korea
- 2004 “DNA vaccines for cancer” Invited Speaker, Molecular Immunology, 10th SCBA International Symposium, Beijing, China
- 2004 “DNA vaccines for HPV” Invited Speaker, 17th Annual Meeting of AMLI, Baltimore, MD.
- 2004 “DNA vaccines for cervical cancer” Invited speaker, Center for Pharmacogenetics, University of Pittsburgh School of Pharmacy, Pittsburgh, PA.
- 2005 “ DNA vaccines for cancers” Invited speaker, Department of Immunology, Baylor College of Medicine, Houston, TX.
- 2005 “DNA vaccine for HPV-associated cancers” Invited speaker, Microbial Immunity and Vaccine Development Research Seminars, Department of Molecular Microbiology and Immunology, The Johns Hopkins University, Baltimore, MD
- 2005 “A new mechanism for tumor evasion” Invited Speaker, EMBO Structural Biology, Siena, Italy
- 2005 “Therapeutic HPV vaccines” Invited Speaker, AACR Frontiers in Cancer Prevention Research, Baltimore, MD
- 2005 “HPV vaccines for treatment and prevention of cervical cancer” Invited speaker, “ Eastern Pennsylvania Branch, American Society for Microbiology on “STD and other Genital Tract Infections: Current Status and Future Trends” Philadelphia, PA
- 2005 “New technologies in the future medicine” Invited speaker in Korea University Centennial Celebration Symposium, Seoul, South Korea
- 2006 “Strategies to enhance PMED DNA vaccine potency” Invited speaker, DNA Vaccine by Gene Gun Meeting at Magdalen College, Oxford England.
- 2006 “Innovative strategies to enhance DNA vaccine potency” Invited speaker, City of Hope Hospital, Los Angeles, CA
- 2006 “Enhancing DNA vaccine potency using RNAi technology” Invited speaker, The 4th International Workshop on DNA vaccines, The Castle Trest, Czech Republic
- 2006 “Cancer immunotherapy using RNAi technology” Invited Speaker, the Fourth Annual RNA Interference meeting, San Francisco, CA
- 2006 “Immunotherapy and immune evasion” Invited speaker, the 11th SCBA meeting Vaccine and Antiviral Therapy Workshop, San Francisco, CA
- 2006 “Combinatorial immunotherapies to amplify vaccine-induced immunity” Invited speaker, the National Cooperative Drug Discovery Group (NCDDG) Program, Houston, Texas
- 2006 “Therapeutic HPV vaccines” Invited speaker, “Keerti Shah Day” Department of Molecular Microbiology and Immunology, The Johns Hopkins University, Baltimore, MD.

- 2006 “Immunotherapy and immune evasion” Invited Speaker, HIV and AIDS Malignancy Branch Seminar Series, NCI, Bethesda, MD
- 2006 “Development of therapeutic HPV vaccines” Invited speaker, Comprehensive Cancer Center, University of Alabama at Birmingham, Alabama
- 2006 “Development of Therapeutic HPV vaccines” Invited speaker, North America Taiwanese Medical Association, Baltimore Chapter, Baltimore, Maryland
- 2007 “Cancer Immunotherapy and tumor immune evasion” Invited speaker, Gene Therapy and Vaccines Program. University of Pennsylvania, Philadelphia, PA
- 2007 “Papillomaviruses and Human Cancer: What is Next?” invited speaker, Longrifles Conference, The Johns Hopkins University, Baltimore, Maryland.
- 2007 “Development of therapeutic HPV vaccines” invited speaker, DNA Vaccines 2007, Malaga, Spain
- 2007 “A morphologists view on reflex HPV testing versus reflex cytologie” Invited speaker, the Belgian Society for Clinical Cytology, Antwerp, Belgian
- 2007 “Cancer Immunotherapy and tumor immune evasion” invited speaker, Department of Pathology, University of Alabama at Birmingham, Alabama
- 2007 “Cancer Immunotherapy and tumor immune evasion” invited speaker, Vaccine Branch , NCI, Bethesda, MD
- 2007 “Development of therapeutic HPV vaccines” invited speaker, the 58th World Congress of Obstetrics and Gynecology, Monterrey, Mexico
- 2007 “Cancer Immunotherapy and tumor immune evasion” invited speaker, Cancer Vaccines/Adjuvants/Delivery for the Next Decade, The German Cancer Research Center, Heidelberg, Germany
- 2007 “DNA vaccines for cervical cancer: from bench to bed site”. invited speaker, Korean Society of Medical Biochemistry & Molecular Biology. Seoul, South Korea
- 2007 “Antigen-Specific Cancer Immunotherapy” invited speaker, Ansan hospital. Seoul, South Korea.
- 2008 “Cancer Immunotherapy and tumor immune evasion” invited speaker, Translational Research, Department of Oncology, Johns Hopkins Hospital
- 2008 “Development of innovative preventive and therapeutic HPV Vaccines-post Gardasil era” invited speaker, Advanced Molecular Pathology, 2008 USCAP meeting, Denver, CO
- 2008 “Cancer immunotherapy using DNA vaccines” invited speaker, UC Davis Cancer Center, California
- 2008 “Development of innovative therapeutic HPV vaccines” invited speaker, International Committee on viral oncology research, Philadelphia, PA
- 2008 “Development of innovative preventive and therapeutic HPV Vaccines-post Gardasil era” invited speaker, CAMS, New York, NY
- 2008 “Therapeutic vaccine strategies and measures important in vaccine trials” invited speaker, Eurogen, Nice France
- 2008 “Efficacy of HPV Vaccination for Prevention of Cervical Cancer-post Gardasil Era” invited speaker, Hong Kong Cancer Institute/AACR International Conference, Hong Kong, China
- 2009 “Therapeutic vaccines for cervical cancer: from bench to bed side” invited speaker, Asian Pacific Medical Student Symposium, Taipei, Taiwan, R.O.C.
- 2009 “Development of innovative therapeutic HPV vaccines” invited speaker, Viral Oncology Group, Johns Hopkins University, Baltimore, MD

- 2009 “Therapeutic HPV DNA vaccines for clinical trials” invited speaker, Department of Biophysics, Arizona State University, Phoenix, AZ
- 2009 “Cancer immunotherapy for cervical cancer: from bench to bedside” invited speaker, Department of Pathology, University of Maryland, Baltimore, MD
- 2009 “Development of innovative therapeutic HPV vaccines” invited speaker, Department of Microbiology and Immunology, Penn State University, Hersey, Pennsylvania
- 2009 “Perspectives in the preventive and therapeutic HPV vaccines” invited speaker, Department of Microbiology, Albany State University, Albany, New York.
- 2009 “New Vaccines for cervical cancer” Invited speaker, BIT's 2nd Annual Congress and Expo of Molecular Diagnostics (CEMD-2009), Beijing.
- 2009 “Perspectives for HPV Vaccine Development” Invited key-note speaker, Formosan Medical Association, Taipei, Taiwan.
- 2010 “Perspectives for HPV vaccine development for cervical cancer” Invited speaker, The Bangladesh Society of Biochemistry and Molecular Biology, Dhaka, Bangladesh.
- 2010 “Therapeutic HPV Vaccine Development” Invited speaker, 2010 DNA Meeting, New Orleans, LA.
- 2010 “Perspectives for HPV Vaccine Development” Invited speaker at Medical College of Georgia.
- 2010 “Development of Therapeutic HPV Vaccines: from Bench to Bedside” Invited speaker, Stem cell and Gene therapy Clinical Trials Symposium, Chang Gung Memorial Hospital, Taipei, Taiwan.
- 2010 “Antigen Specific Cancer Immunotherapy for Gynecological Malignancies” Invited speaker, BIT's 3rd World Cancer Congress 2010, Singapore
- 2010 "Perspectives for preventive and therapeutic HPV vaccines" Invited speaker, Institute of Molecular and Cell Biology, Singapore.
- 2010 “Therapeutic HPV Vaccine Development” Invited speaker, BIT’s 1st World Congress of Virus and Infections 2010 (WCVI-2010), Busan, South Korea.
- 2010 “Perspectives for HPV Vaccine Development” Invited speaker, Zhongshan School of Medicine at Guangzhou, China.
- 2010 “Perspectives in Preventive and Therapeutic HPV Vaccines for Cervical Cancer” Invited speaker, 15th Conference on Healthcare of the Chinese in North America, CAMASC, Los Angeles, California
- 2010 “Perspectives for therapeutic HPV vaccine development” Invited speaker, Gene-based Vaccines meeting 2010, Cannes, France
- 2010 “Perspectives for HPV Vaccine Development” Invited speaker, Tumor Immunology and Immunotherapy Program, Roswell Park Cancer Institute, Buffalo.
- 2011 “Enhancement of DNA tumor vaccines via Toll-like Receptor Ligands” Invited speaker, AACR Annual Meeting - Session on Innate Receptors and Cancer, Orlando.
- 2011 "Therapeutic vaccine approaches" Invited speaker, EUROGIN 2011 congress, Lisbon.
- 2011 “Molecular Pathology and Personalized Medicine” Invited speaker, 7th Asia Pacific IAP Congress, Taipei, Taiwan
- 2011 “Control of HPV-associated Cancer through Combined Treatment with Death Receptor 5-specific Antibody and Therapeutic HPV Vaccines” Invited speaker, BIT’s 3rd Annual International Congress of Antibodies-2011, Beijing, China
- 2011 “Perspectives for Preventive and Therapeutic HPV Vaccine Development” Invited speaker, Karmanos Cancer Institute, Detroit, Michigan

- 2011 “Perspectives for Therapeutic HPV Vaccine Development” Invited Speaker, International Symposium on Human Pathogenic and Oncogenic Viruses, Taipei, Taiwan, R.O.C.
- 2011 “Antigen-specific Cancer Immunotherapy using Calreticulin” Invited Speaker, 9th International Calreticulin Workshop, Copenhagen, Denmark
- 2012 “Innovative strategies to break immune tolerance using DNA vaccines” Invited Speaker. Viral Oncology Group, The Johns Hopkins University, Baltimore, MD
- 2012 “Development of Therapeutic HPV Vaccines: from Bench to Bedside” Invited Speaker. UNM Interdisciplinary HPV Prevention Center. University of New Mexico, New Mexico
- 2012 “Treatment of melanoma combining cancer gene therapy and immunotherapy” Invited Speaker, Melanoma Research Alliance Fourth Annual Scientific Retreat, Washington DC
- 2012 “Development of cancer vaccines by engineering antibody to break immune tolerance” Invited Speaker, 4th International Congress of Antibodies-2012, Beijing China
- 2012 “Cancer Immunotherapy for HPV-Associated Malignancies” Invited Speaker, 17th Taiwan Joint Cancer Conference (TJCC), Taipei, Taiwan
- 2012 “Therapeutic HPV vaccines” Invited Speaker, Zhangjiang Forum on Translational Medicine, from Research to Commercialization, Shanghai, China
- 2012 “ Innovative Therapeutic HPV vaccines” Invited Speaker, World Congress of Microbes-2012, Guangzhou, China
- 2012 “Perspectives for Preventive and Therapeutic HPV Vaccine Development” Invited speaker, Department of Biology and Biochemistry, University of Houston, Houston, Texas
- 2012 “Development of Therapeutic HPV Vaccines: from Bench to Bedside” Invited Speaker, Emerging Market for Biopharmaceuticals: Opportunities and Challenges, CBA, Qiangdao, China
- 2012 “Innovative Strategy to Overcome Immune Tolerance” Invited Speaker, 6th International Conference on Cell Therapy, Seoul South Korea
- 2012 “Perspectives for HPV Vaccine Development” Invited Speaker, Immunology Program Lee Moffitt Cancer Center , University of South Florida, Temple, Florida
- 2012 “Innovative treatment for cervical cancer” Invited speaker, Georgia Health Sciences University Cancer Center, Augusta, Georgia
- 2013 “Innovative HPV Vaccines” Invited Speaker, 2013 Asian Pacific Medical Student Society meeting, Taipei Taiwan
- 2013 “ The Employment of Antibody to Overcome Immune Tolerance for Cancer Immunotherapy” Invited Speaker, 5th International Congress of Antibodies, Hangzhou, China
- 2013 “Overview of Therapeutic Vaccination and Other Immunomodulatory Strategies” Invited Speaker, Icahn School of Medicine at Mount Sinai , New York, NY
- 2013 “Innovative Therapeutic HPV Vaccines for HPV-Associated Malignancies” 2013 SCBA Biannual Meeting , Xi-An, China
- 2013 “ Innovative Treatment for HPV-Associated Cervical Cancer “ Invited Speaker, UCSF HIV-Malignancies Symposium, San Francisco, California
- 2014 “Future HPV Vaccines and Considerations for Implementation in Developing Countries” Invited Speaker, 2014 Conference of Asia Oceania Research Organization on Genital Infections and Neoplasia. Beijing, China
- 2014 “ Innovative Therapeutic Vaccines for Persistent HPV Infections” Invited Speaker, 2014 6th Annual World Congress of Vaccines, Dalian, China.
- 2014 “Innovative Treatment for HPV-Associated Cervical Cancer” Invited Speaker, 11th

June 2014

- International Conference of the Asian Clinical Oncology Society, Taipei, Taiwan.
- 2014 “Perspectives for HPV Vaccine Development” Invited Speaker, National Health Research Institutes, Taiwan, R.O.C.
- 2014 “Perspectives for HPV vaccine development” Invited Key-note Speaker, 11th Japanese Gynecological Oncologist Conference, Kumamoto, Japan
- 2014 “Impact of HPV vaccines on clinical management of HPV-associated diseases” Invited Speaker, Shanghai 10th People Hospital, Shanghai, China
- 2015 “HPV Immunology: an update” Invited Speaker 2015 Eurogin, Sevilla, Spain
- 2015 “Immune responses to HPV therapeutic vaccines” Invited Speaker, 2015 Eurogin, Sevilla, Spain
- 2015 “ Perspectives for HPV vaccine development” Invited Speaker, 2015 Cancer Symposium, Seoul, South Korea

OTHER PROFESSIONAL ACCOMPLISHMENTS

January 1998- January 1999

President of the Society of Chinese Bioscientists in America (SCBA), DC Chapter

January 2000-January 2001

Secretary-Treasurer of International Association of Chinese Pathologists

January 2001-January 2003

President-Elect of International Association of Chinese Pathologists

January 2003-July 2005

President of International Association of Chinese Pathologists

March 2004-February 2005

President-Elect-Elect of the Binford-Dammin Infectious Disease Society

March 2005-February 2006

President-Elect of the Binford-Dammin Infectious Disease Society

March 2006- February 2007

President of the Binford-Dammin Infectious Disease Society

January 2010- present

Co-Executive Director of the Society of Chinese Bioscientists in America (SCBA)