

## SUMMARY

Researcher with 10+ years of inter-disciplinary experience spanning molecular biology, biophysics, and analytical chemistry. My research accomplishments include: elucidating the apoptosis mechanism through purified Hepatitis C virus core protein *in vitro*; and development of DNA vaccine of Dengue and West Nile viruses in BALB/c mice; and synthesis, targeting, purification, and imaging of antibody-conjugated nanoparticles in *in vitro* and *in vivo* tumor model in nude mice with potential magnetic resonance imaging (MRI) diagnostic and therapeutic utility. My strengths include: Leadership, self-motivated, organized, and teamwork with colleagues for creating ideas and problem solving.

## SKILLS

**Laboratory:** Mammalian Cell Culture, PCR, Adenoviral Vector Cloning – Amplification and Infection, Electroporation of DNA vaccine, ÄKTA HPLC, UV/Vis, Column Chromatography, Recombinant Protein Expression and Purification, Plasma Membrane Purification, ELISA, SDS-PAGE, Western Blotting, FACS, Fluorescence Spectroscopy, Microtome Tissue Cutting, Immunohistochemistry, Immunofluorescence, *In vitro* translation, *In vivo* Injection and Imaging, Animal Handling, Cytotoxic T Lymphocyte Release Assay, Nanoparticle Synthesis and Targeting, Drug Delivery, Microfluidics, Bioconjugation, Rheology, Light Scattering, Confocal Microscopy, Transmission Electron Microscopy, Scanning Electron Microscopy

**Computer:** SigmaPlot, ImageJ, Photoshop, Matlab, MS Office suite, Network Management, Website edit/maintenance

**Languages:** Proficient in Mandarin Chinese, English

## RESEARCH EXPERIENCE

### Ph.D. Student

Jun 2009 – Present

*University of Maryland – Department of Radiation Oncology, School of Medicine*  
– *Complex Fluids and Nanomaterials Group, School of Engineering*

**Project:** Designation of biocompatible nanoparticles as vector for therapeutic medical imaging carrier and treatment

- Developed and characterized nanoparticles formulated by various materials as desired drug carriers
- Functionalized nanoprobes with bioconjugation of ligand for targeting Head & Neck cancer tumor cells *in vitro* and evaluated the binding efficacy by Magnetic Resonance Imaging (MRI) *in vivo* in nude mice
- Engineered Erythrocyte Ghost (Erythroosomes) or Nanoerythroosomes conjugated with anti-EGFR antibody as an economical, efficient, and large scale production of biocompatible drug delivery system
- Collaboration involving ATP encapsulation in Erythroosome for releasing improvement

### Biology Research Specialist

Dec 2006 – Jun 2008

*University of Pennsylvania – Department of Pathology and Laboratory Medicine, School of Medicine*

**Project:** Identification of the pathogenesis of the mosquito-borne *Flavivirus* disease and DNA vaccine development

- Established West Nile Virus Pathogenesis for serving in drug discovery program
- Analyzed the functionality of West Nile Virus & Dengue Virus DNA vaccine construct in 293 cells
- Developed and examined Novel DNA Vaccine in BALB/c mice for inducing broad immune response against all four serotypes of Dengue Virus and West Nile Virus

### Microbiology Research Assistant

Sep 2003 – Jul 2005

*National Taiwan University Hospital – Department of Pediatrics, Gastroenterology & Hepatology Group*

**Project:** RBMY, A Male Germ Cell-Specific RNA-Binding Protein, Activated in Human Liver Cancers

- Manipulated the expression level of RBMY protein in transgenic mice
- Prepared frozen/formalin-fixed, paraffin-embedded liver tissue and evaluated expression with IHC/IFA
- Developed and optimized immuno-staining protocols for evaluating RBMY protein in human liver specimen

### Master Thesis

Aug 1999 – Jul 2001

*National Taiwan University – Department of Microbiology in College of Medicine*

**Project:** Effect of the Hepatitis C Virus Core Protein on the TNF Cytokine Superfamily-mediated Cellular Apoptosis in the Hepatoma cells

- Cloned and amplified HCV Core-inserted Adenoviral vector as material to establish the HCV model
- Evaluated the infected apoptosis pathway of HepG2 / Huh7 cell lines with HCV core protein
- Validated the activation of cytokines in T-cells via HCV Core expression by cell apoptosis assay

### Laboratory Research Technician

Jul 1997 – Jun 1999

*National Taiwan University – Department of Plant Pathology and Entomology*

- Assayed the susceptibility of the honeybee, *Apis mellifera* and separated the colonies
- Management of lab equipment and maintenance of computers and network service

## EDUCATION

**Ph.D. in Bioengineering**, *School of Engineering*  
University of Maryland, College Park, MD

*Honor: Hong Ji Distinguished Fellowship, 2008-2009*  
Goldhaber Award, 2014

**Expected: May 2015**

**M.S. in Biotechnology**, *School of Engineering and Applied Science*  
University of Pennsylvania, Philadelphia, PA

**Dec 2006**

**M.S. in Microbiology**, *College of Medicine, Graduate Institute of Microbiology*  
National Taiwan University, Taipei, Taiwan

**Jun 2001**

**B.S. in Plant Pathology and Entomology**, *College of BioResources and Agriculture*  
National Taiwan University, Taipei, Taiwan

**Jun 1999**

*Honor: Presidential Award*

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## LEADERSHIP / PROFESSIONAL ASSOCIATION

**Membership Director**, National Taiwan University Alumni Association in the Washington-Baltimore Area **2013 – Present**

**Vice President**, Great DC Area Taiwanese Student Association **2010 – 2011**

**Secretary**, University of Pennsylvania Taiwan Student Association **2006 – 2007**

**Associate Member**, American Association of Physicists in Medicine **2013 – 2014**

**Associate Member**, American Society for Radiation Oncology **2012 – 2013**

**Associate Member**, American Chemical Society **2012 – 2014**

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## TEACHING EXPERIENCE

### *Teaching Assistantship*

**Biology for Engineers Laboratory**  
**Biomaterial**

*Professor:* Dr. Helim Aranda-Espinoza

**Fall 2009**

*Professor:* Dr. Joonil Seog

**Spring 2010**

### *Undergraduate Mentoring*

**Ariel Ash-Shakoor, Project:** Synthesis of stable chitosan nanoparticle and characterization

**2010 – 2012**

**Dao Huang, ASPIRE Award, Project:** Development of nano-sized vesicle via microfluidic devices

**2013 – 2014**

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## PUBLICATION

- **Yuan-Chia Kuo**, Chiwei Hung, Rao P. Gullapalli, Su Xu, Jiachen Zhuo, Srinivasa R. Raghavan, and Warren D. D'Souza, "Liposomal Nanoparticles that Combine Anti-EGFR Antibodies and MRI Contrast Agents: Synthesis and In Vitro Characterization." **RSC Advances** **4** (2014) **33756–33764**
- Janet Hsu, Daniel Serrano, Tridib Bhowmick, Kishan Kumar, Yang Shen, **Yuan-Chia Kuo**, Carmen Garnacho and Silvia Muro, "Enhanced endothelial delivery and biochemical effects of  $\alpha$ -galactosidase by ICAM-1-targeted nanocarriers for Fabry disease." **Journal of Controlled Release** **149** (2011) **323–331**
- Mathura P. Ramanathan, **Yuan-Chia Kuo**, Bernard H. Selling, Qianjun Li, Niranjana Y. Sardesai, J. Joseph Kim, and David B. Weiner, "Development of a novel DNA SynCon™ tetra-valent dengue vaccine that elicits immune responses against four serotypes." **Vaccine** **27** (2009) **6444–6453**
- Mathura P. Ramanathan, Michele A. Kutzler, **Yuan-Chia Kuo**, Jian Yan, Harrison Liu, Vidhi Shah, Amrit Bawa, Bernard Selling, Niranjana Y. Sardesai, J. Joseph Kim and David B. Weiner, "Coimmunization with an optimized IL15 plasmid adjuvant enhances humoral immunity via stimulating B cells induced by genetically engineered DNA vaccines expressing consensus JEV and WNV E DIII." **Vaccine** **27** (2009) **4370–4380**

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## SELECTED Conference Oral Presentations:

- **Yuan-Chia Kuo**, Dao Huang, Hyuntaek Oh, Warren D. D'Souza, Srinivasa R. Raghavan. (2014) Colloidal properties of erythrocytes derived from red blood cells  
88<sup>th</sup> ACS Colloids and Surfaces 2014 Symposium, Philadelphia, PA
- **Yuan-Chia Kuo**, Chiwei Hung, Srinivasa R. Raghavan, Warren D. D'Souza. (2013) Imaging of Targeted Cancer Therapy using Multifunctional Liposomal Nanoparticles and MRI  
55<sup>th</sup> American Association of Physicists in Medicine (AAPM) Annual Meeting and Exhibition. Indianapolis, IN
- **Yuan-Chia Kuo**, Chiwei Hung, Warren D. D'Souza, Srinivasa R. Raghavan. (2013) Multifunctional Liposomal Nanoparticles for Monitoring the Treatment of Head and Neck Cancer by MRI  
2013 Material Research Society (MRS) Spring Meeting. San Francisco, California