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EDUCATION

- Post-Doc Nanoengineering, UC San Diego 01/2012 to 05/2015
- Ph.D. Bioengineering, UC San Diego 12/2011
- M.S. Bioengineering, UC San Diego 06/2008
- B.S., *with Honors* Bioengineering, UC Berkeley 05/2005
- Minor Electrical Engineering and Computer Science
- Minor Mechanical Engineering

WORK EXPERIENCE

- Assistant Research Fellow Institute of Biomedical Sciences, Academia Sinica 06/2015 to present
- Co-founder/Director Arytha Biosciences, CA, San Diego 01/2012 to 05/2015
 - Established and validated GMP manufacturing protocol for a proprietary nanoparticle platform.
 - Raised \$2.4 million in government grants for scalable nanoparticle production.

PUBLICATIONS

1. **Hu C-M**, Chien CY, Liu MT, Fang ZS, Chang SY, Juang RH, Chang SC, Chen HW. Multi-antigen avian influenza A (H7N9) virus-like particles: particulate characterizations and immunogenicity evaluation in murine and avian models. *BMC Biotechnology*, 17:2, 2017.
2. Lin SY, Li YT, Chen YT, Chen TC, **Hu C-M**, Chen HW. Identification of an infectious bronchitis coronavirus strain exhibiting a classical genotype but altered antigenicity, pathogenicity, and innate immunity profile. *Scientific Reports*, 6, 37725, 2016.
3. Chen H-W, Huang C-Y, Lin S-Y, Fang Z-S, Hsu C-H, Lin J-C, Chen Y-I, Yao B-Y, **Hu C-M***. Synthetic virus-like particles prepared via protein corona formation enable effective vaccination in an avian model of coronavirus infection. *Biomaterials*, 106, 111-118, 2016.
4. Cheng B, Toh EK, Chen KH, Chang YC, **Hu C-M**, Wu HC, Chau LY, Chen P, Hsieh PC. Biomimicking platelet-monocyte interactions as a novel targeting strategy for heart healing. *Advanced Healthcare Materials*, 4, 2686-2697, 2016.
5. Dehaini D, Fang R, Luk B, Pang Z, **Hu C-M**, Kroll A, Yu CL, Gao W, Zhang L. Ultra-small lipid-polymer hybrid nanoparticles for tumor-penetrating drug delivery. *Nanoscale*, 8, 14411-14419, 2016.
6. Wang F, Fang R, Luk B, **Hu C-M**, Thamphiwatana S, Dehaini D, Angsantikul P, Kroll A, Pang Z, Gao W, Lu W, Zhang L. Nanoparticle-based anti-virulence vaccine for the management of methicillin-resistant *Staphylococcus aureus* skin infection. *Advanced Functional Materials*, 26, 1628-1635, 2016.
7. Luk B, Fang R, **Hu C-M**, Copp J, Thamphiwatana S, Dehaini D, Gao W, Zhang K, Li S, Zhang L. Safe and immunocompatible nanocarriers cloaked in RBC membranes for drug delivery to treat solid tumors. *Theranostics*, 6, 1004-1011, 2016.
8. **Hu C-M**, Fang RH, Wang K-C, Luk BT, Thamphiwatana SK, Dehaini D, Nguyen P, Angsantikul P, Wen CH, Kroll AV, Carpenter C, Ramesh M, Qu V, Patel S, Zhu J, Shi W, Hofman FM, Chen TC, Gao W, Zhang K, Chien S, Zhang L. Nanoparticle biointerfacing by platelet membrane cloaking. *Nature*, 526, 118-121, 2015. **Highlighted: [Nature 2015, 526, 47-48](#); [Science Translational Medicine 2016, 7, 307ec169](#).**
9. Fang R, Luk B, **Hu C-M***, Zhang L*. Engineered nanoparticles mimicking cell membranes for toxin neutralization. *Advanced Drug Delivery Reviews*, 90, 69-80, 2015. *Co-corresponding author.
10. Pang Z; **Hu C-M**, Fang R, Luk B, Gao W, Wang F, Chuluun E, Angsantikul P, Thamphiwatana S, Lu W, Jiang X, Zhang L. Detoxification of organophosphate poisoning using nanoparticle bioscavengers, *ACS Nano*, 9, 6450-6458, 2015.
11. Wang F, Gao W, Thamphiwatana S, Luk B, Angsantikul P, Zhang Q, **Hu C-M**, Fang R, Copp J, Pornpattananankul, Lu W, Zhang L. Hydrogel retaining toxin-absorbing nanosponges for local treatment of methicillin-resistant *Staphylococcus aureus* infection. *Advanced Materials*, 27, 3431-3443, 2015.
12. Gao W, Fang R, Thamphiwatana S, Luk B, Li J, Angsantikul P, Zhang Q, **Hu, C-M**, Zhang L. Modulating antimicrobial immunity via bacterial membrane-coated nanoparticles. *Nano Letters*, 15, 1403-1409, 2015.
13. Copp J, Fang R, Luk B, **Hu C-M**, Gao W, Zhang K, Zhang L. Clearance of pathologic antibodies using biomimetic nanoparticles. *Proceedings of the National Academy of Sciences*, 111, 13481-13484, 2014. **Highlighted: [Proceedings of the National Academy of Sciences 2014, 9, 401](#).**
14. **Hu C-M**, Zhang L. Nanotoxoid Vaccines. *Nano Today*, 9, 401-404, 2014.
15. Fang RH, **Hu C-M**, Luk B, Gao W, Copp J, Tai Y, O'Connor D, Zhang L. Cancer cell membrane-coated

- nanoparticles for anticancer vaccination and drug delivery. *Nano Letters*, 14, 2181-2188, 2014.
16. **Hu C-M**, Fang RH, Luk B, Zhang L. Polymeric nanotherapeutics: clinical development and advances in stealth functionalization strategies. *Nanoscale*, 6, 65-75, 2014.
 17. Luk B, **Hu C-M**, Fang RH, Dehaini D, Carpenter C, Gao W, Zhang L. Interfacial interactions between natural RBC membranes and synthetic polymeric particles. *Nanoscale*, 6, 2730-2737, 2014.
 18. **Hu C-M**, Fang RH, Luk B, Zhang L. Nanoparticle-detained toxin for safe and effective vaccination. *Nature Nanotechnology*, 8, 933-938, 2013. **Highlighted: *Science* 2013, 342, 1418.**
 19. Gao W, **Hu C-M**, Fang RH, Zhang L. Liposome-like nanostructures for drug delivery. *Journal of Materials Chemistry B*, 1, 6569-6585, 2013.
 20. **Hu C-M**, Fang RH, Copp J, Luk B, Zhang L. A biomimetic toxin nanosponge that absorbs pore-forming toxins. *Nature Nanotechnology*, 8, 336-340, 2013. **Highlighted: *Science Translational Medicine* 2013, 5(184), 184ec78.**
 21. Fang RH, **Hu C-M**, Chen K, Luk B, Carpenter C, Gao W, Li S, Zhang D-E, Lu W, Zhang L. Lipid-insertion enables targeting functionalization of erythrocyte membrane-cloaked nanoparticles. *Nanoscale*, 5, 8884-8888, 2013.
 22. Gao W, **Hu C-M**, Fang RH, Luk B, Su J, Zhang L. Surface functionalization of gold nanoparticles with red blood cell membranes. *Advanced Materials*, 25, 3549-3553, 2013.
 23. **Hu C-M**, Fang RH, Luk B, Chen K, Carpenter C, Gao W, Zhang K, Zhang L. 'Marker-of-self' functionalization of nanoscale particles through a top-down cellular membrane coating approach. *Nanoscale*, 5, 2664-2668, 2013.
 24. Kong S, Sartor M, **Hu C-M**, Zhang W, Zhang L, Jin S. Magnetic field activated lipid-polymer hybrid nanoparticles for stimuli-responsive drug release. *Acta Biomaterialia*, 9, 5447-5452, 2013.
 25. Aryal S, **Hu C-M**, Fang RH, Dehaini D, Carpenter C, Zhang D-E, Zhang L. Erythrocyte membrane-cloaked polymeric nanoparticles for controlled drug loading and release. *Nanomedicine*, 8, 1271-1280, 2013.
 26. **Hu C-M**, Fang RH, Zhang L. Erythrocyte-inspired delivery systems. *Advanced Healthcare Materials*, 1, 537-547, 2012.
 27. Fang RH, Chen K, Aryal S, **Hu C-M**, Zhang K, Zhang L. Large-scale synthesis of lipid-polymer hybrid nanoparticles using a multi-inlet vortex reactor. *Langmuir*, 28, 13824-13829, 2012.
 28. **Hu C-M**, Zhang L. Nanoparticle-based combination therapy to overcome drug resistance in cancer. *Biochemical Pharmacology*, 83, 1104-1111, 2012.
 29. Aryal S, **Hu C-M**, Zhang L. Synthesis of Ptsome: A platinum-based liposome-like nanostructure. *Chemical Communications*, 48, 2630-2632, 2012.
 30. Fang, RH, **Hu C-M**, Zhang L. Nanoparticles disguised as red blood cells to evade the immune system. *Expert Opinion on Biological Therapy* 12, 385-389, 2012.
 31. Aryal S, **Hu C-M**, Zhang L. Nanoparticle drug delivery enhances the toxicity of hydrophobic-hydrophilic drug conjugates. *Journal of Materials Chemistry*, 22, 994-999, 2012.
 32. **Hu C-M**, Zhang L, Aryal S, Cheung C, Fang R, Zhang L. Erythrocyte membrane-camouflaged polymeric nanoparticles as a biomimetic delivery platform. *Proceedings of the National Academy of Sciences*, 108, 10980-10985, 2011.
 33. Aryal S, **Hu C-M**, Zhang L. Polymeric nanoparticles with precise ratiometric control over drug loading for combination therapy. *Molecular Pharmaceutics*, 8, 1401-1407, 2011.
 34. Balasubramanian S, Kagan D, **Hu C-M**, Campuzano S, Lobo-Castañon M, Lim N, Kang D, Zhang L, Wang J. Micromachine enabled capture and isolation of cancer cells in complex media. *Angewandte Chemie International Edition*, 50, 4161-4164, 2011.
 35. **Hu C-M**, Kaushal S, Cao HS, Aryal S, Sartor M, Esener S, Bouvet M, Zhang L. Half-antibody functionalized lipid-polymer hybrid nanoparticles for targeted drug delivery to carcinoembryonic antigen (CEA) presenting pancreatic cancer cells. *Molecular Pharmaceutics*, 7, 914-920, 2010.
 36. Fang R, Aryal S, **Hu C-M**, Zhang L. Quick synthesis of lipid-polymer hybrid nanoparticles with low polydispersity using a single-step sonication method, *Langmuir*, 26, 16958-16962, 2010.
 37. **Hu C-M**, Aryal S, Zhang L. Nanoparticles assisted combination therapies for effective cancer treatment. *Therapeutic Delivery*, 1, 323-334, 2010.
 38. Zhang L, Pornpattananangkul D, **Hu C-M**, Huang C-M. Development of nanoparticles for antimicrobial drug delivery. *Current Medicinal Chemistry*, 17, 585-594, 2010.
 39. Aryal S, **Hu C-M**, Zhang L. Combinatorial drug conjugation enabled nanoparticle dual drug delivery. *Small*, 6, 1442-1448, 2010.
 40. Aryal S, **Hu C-M**, Zhang L. Polymer-cisplatin conjugate nanoparticles for acid-responsive drug delivery. *ACS Nano*, 4, 251-258, 2009.
 41. **Hu C-M**, Zhang L. Therapeutic nanoparticles to combat cancer drug resistance. *Current Drug Metabolism*, 10, 836-841, 2009.
 42. Lefkowitz RB, Marciniak JY, **Hu C-M**, Schmid-Schönbein GW, Heller MJ. An electrophoretic method for the detection of chymotrypsin and trypsin activity directly in whole blood. *Electrophoresis*, 31, 403-410, 2009.
 43. Stoeber B, **Hu C-M**, Liepmann D, Muller SJ. Passive flow control in microdevices using thermally responsive polymer solutions. *Physics of Fluids*, 18, 053103, 2006.

AWARDS

- 2016** The Li Foundation Heritage Prize
- 2016** 4th Annual Excellence in Creativity Award for Young Scholar from The Foundation for the Advancement of Outstanding Scholarship.
- 2016** Member of the Global Young Academy
- 2015** Recipient of the Academia Sinica Career Development Award
- 2014** Selected participant of the 64th Meeting of Nobel Laureates, Lindau, Germany
- 2013** Chancellor's Postdoctoral Scholar Award, UCSD 2013— awarded for outstanding research and exhibition of leadership, mentorship and service to 4 top postdoctoral scholars at UCSD.
- 2011** Siebel Scholar, Class of 2012 – awarded annually for academic excellence and demonstrated leadership to 85 top students from the world's leading graduate schools.
- 2010** Best poster award at the 8th International Nanomedicine and Drug Delivery Symposium, Omaha, NE
- 2003/2004** Guidant Undergraduate Research Fellowship

PATENTS

1. **Hu C-M**, Chen H-W, Chen Y-I, Internally fixed lipid vesicle. US Patent Serial No. 62/369,440.
2. **Hu C-M**, Chen H-W, Yao B-Y, Thin-shell polymeric nanoparticles and uses thereof. US Patent Serial No. 62/312,015.
3. Gao W, **Hu C-M**, Processes and systems for preparing cellular or viral membranes and nanoparticles. US Patent Serial No. 62/247,161
4. Zhang L, Gao W, Fang R, **Hu C-M**, Modulating antibacterial immunity via bacterial membrane-coated nanoparticles, Docket No. SD2014-171
5. Zhang L, **Hu C-M**, Copp J, Fang R, Luk B. Self-antigen displaying nanoparticles targeting auto-reactive immune factors and uses therefore, Docket No. SD2015-037.
6. Zhang L, **Hu C-M**, Gao W, Copp J. Hydrogel toxin-absorbing or binding nanoparticles, PCT/US2015/021702.
7. Zhang L, **Hu C-M**, Nanoparticles leverage biological membranes to target pathogens, PCT/US2014/050355.
8. **Hu, C-M**. Toxoid preparation and uses thereof, PCT/US2014/067688.
9. Zhang L, **Hu C-M**, Membrane encapsulated nanoparticles and method of use, PCT/US2012/039411.
10. Zhang L, Aryal S, **Hu C-M**. Ratiometric combinatorial drug delivery, US20130122056 A1.

INVITED TALK/CONFERENCE PRESENTATIONS

1. **Hu C-M**. "Advancing medicine through biologically inspired nanotechnology", *Invited talk at the 3rd Cross-Strait Life Sciences Symposium, Shanghai, China, 11/2016.
2. **Hu C-M**. "Biologically inspired nanotechnology towards improving infectious disease treatment and management", *Invited talk at the Galveston National Laboratory, Galveston, TX, 08/2016.
3. **Hu C-M**. "Advancing medicine through biologically inspired nanotechnology", *Invited talk at the International Symposium on Cell Physiology and Aging Research, Kaoshiung Medical University, Taiwan, 04/2016
4. **Hu C-M**. "Nanotechnology in Medicine and Vaccine Development", *Invited talk at the School of Medicine, National Cheng Kung University, Taiwan. 03/2016
5. **Hu C-M**, "Cell membrane cloaked nanoparticles for Therapeutic Applications", *Invited plenary talk at the 7th Japan-Taiwan Symposium on Nanomedicine, Kyoto University, Japan, 01/2016
6. **Hu C-M**, Chen H-W. "Cell membrane cloaked nanoparticles for biologically inspired drug delivery", 13th US Japan Drug Delivery Systems Symposium, Maui, HI, 12/2015
7. **Hu C-M**. "Biologically inspired nanomedicine", *Invited talk at the Taiwan Society for Biochemistry and Molecular Biology Autumn Camp, Taiwan. 11/2015
8. **Hu C-M**. "Nanoparticle biointerfacing via cell membrane cloaking for emerging therapeutic applications", *Invited talk at Materials Science and Engineering, Johns Hopkins University, MD. 2/2015
9. **Hu C-M**. "Cell membrane cloaked nanoparticles for emerging therapeutic applications", *Invited talk at Materials Science and Engineering, Stanford University, CA. 1/2015
10. **Hu C-M**. "Nanoparticle biointerfacing via cell membrane cloaking for emerging therapeutic applications", *Invited talk at the School of Pharmacy, National Taiwan University, Taiwan. 12/2014
11. **Hu C-M**. "Cell membrane cloaked nanoparticles for emerging therapeutic applications", *Invited talk at the School of Medicine, National Cheng Kung University, Taiwan. 12/2014
12. **Hu C-M**. "Nanoparticle biointerfacing via cell membrane cloaking for emerging therapeutic applications", *Invited talk at the Institute of Biomedical Sciences, Academia Sinica, Taiwan. 12/2014
13. **Hu C-M**. "Nanoparticle biointerfacing via cell membrane cloaking for medical applications", *Invited talk at Chang Gung University, Taiwan. 12/2014
14. **Hu C-M**. "Cell membrane cloaked nanoparticles for biomedical applications", *Invited talk at China Medical

University, Taiwan. 12/2014

15. Hu C-M. “RBC membrane cloaked nanoparticles for biomimetic drug delivery and detoxification”, *Invited talk at the Department of Veterinary Medicine, National Taiwan University, Taiwan. 12/2013
16. Hu C-M, Fang RH, Aryal S, Zhang L. “Red blood cell membrane coated polymeric nanoparticles”, ACS Meeting and Exposition 2012, San Diego, CA, 03/2012
17. Hu C-M, Aryal S, Fang RH, Zhang L. “Biomimetic long-circulating nanoparticles for combinatorial drug delivery”, NanoScience and Emerging Technology in Cancer Research 2011, San Diego, CA, 12/2011
18. Hu C-M, Zhang L. “Biomimetic long-circulating nanoparticles for combinatorial drug delivery”, SPIE Optics and Photonics Conference 2011, San Diego, CA, 08/2011
19. Hu C-M, Aryal S, Bouvet M, Esener S, Zhang L. “Lipid-polymer hybrid nanocarriers for controlled drug delivery”, JSOE 30th Research Expo, University of California-San Diego, La Jolla, CA, 04/2011.
20. Hu, C-M, Aryal S, Clawson C, Fang RH, Zhang L. “Bioinspired lipid-coated polymeric nanoparticles for controlled drug delivery”, ACS Meeting and Exposition 2011, Anaheim, CA, 03/2011
21. Hu C-M, Aryal S, Clawson C, Fang RH, Zhang L. “Lipid-polymer hybrid nanocarriers for controlled drug delivery” 8th International Nanomedicine and Drug Delivery Symposium, Nano DDS 2010, Omaha, NE, 10/2010
22. Hu C-M, Aryal S, Bouvet M, Esener S, Zhang L. “Half-antibody conjugated dual drug nanoparticles for targeted cancer chemotherapy”, JSOE 29th Research Expo, University of California-San Diego, La Jolla, CA, 04/2010.

GRANTS

- 2017-2019** Principal investigator. Biomembrane cloaked nanoparticles for anti-influenza drug delivery and vaccination. (\$2,000,000 NT)
- 2016-2019** Principal investigator. Adjuvant-loaded nanoparticles for influenza virus vaccine development. NSC105-2119-M-001-014 (\$27,000,000 NT)
- 2016-2019** Principal investigator. Synthetic virus-mimetic nanoparticles for MERS-CoV vaccination. NSC105-2321-B-001-055 (\$7,200,000 NT)
- 2014-2015** Principal investigator. Universal Antivenom. Phase II, Department of Defense SBIR Grant, # D2-1371. Awardee: Arytha Biosciences, San Diego, CA. (\$1,500,000 USD)
- 2014-2015** Principal investigator. Development of biomimetic toxin nanosponges with enhanced toxin affinity. Phase II, NSF SBIR Grant, #1456104. Awardee: Arytha Biosciences, San Diego, CA. (\$750,000 USD)
- 2013-2014** Principal investigator. Development of biomimetic toxin nanosponges with enhanced toxin affinity. Phase I, NSF SBIR Grant, # 1345715. Awardee: Arytha Biosciences, San Diego, CA. (\$150,000 USD)

PROFESSIONAL SERVICE

Ad Hoc Reviewer: *ACS Biomaterials Science and Engineering, Acta Biomaterialia, Advanced Drug Delivery Reviews, Advanced Functional Materials, Advanced Materials, Biomaterials, Journal of American Chemical Society, Journal of Biomedical Science, Journal of Medical and Biomedical Engineering, Nanomedicine, Nanoscale, Plos One, Proceedings of the National Academy of Sciences, Scientific Reports, Theranostics.*

TEACHING EXPERIENCE

- 2015-present** **Research Mentor—Academia Sinica, Taiwan**
5 undergraduate students
2 master’s students (Y.C. Huang and Z.S. Fang from the National Taiwan University)
2 Ph.D. students (S. Chattopadhyay from the Taiwan International Graduate Program, and Y.H. Liu from the National Defense Medical Center)
- 2009-2015** **Research Mentor—UC San Diego**
Served as direct mentor to 1 postdoc, 5 graduate, 1 medical, and 2 undergraduate students
- 2006-2009** **Teaching Assistant—UC San Diego**
Bioelectronics, Biotechnology Laboratory, Statistical Thermodynamics, General Chemistry, Bioengineering Laboratory, and Inorganic Chemistry Laboratory.