

## George Huang

Assistant Professor  
Department of Biochemistry and Microbiology  
Center for Health Services  
Oklahoma State University

### Contact Information:

Email: [george.huang@okstate.edu](mailto:george.huang@okstate.edu)  
Phone: 918-525-6327  
Office: 100 S. Bliss Ave, Tahlequah, OK 74464

### Research Interests:

I am interested in bacterial pathogenesis with particular emphasis on the anaerobic pathogen *Clostridium difficile* and *Fusobacterium nucleatum*. *C. difficile* is the number one cause of antibiotic-associated diarrhea worldwide and is a public health concern due to its economic burden and patient relapses. The usage of inappropriate antibiotics disrupt the intestinal normal flora, which allows *C. difficile* to proliferate and damage the gut linings. In our lab we are taking a three-prong approach to combat with *C. difficile* infection. 1. Prevention via the development of a mucosal vaccine. 2. Offensive measures via screening for non-antibiotic antimicrobial agents. 3. Dissecting the molecular basis of toxin regulation.

### Education:

2002-2007: Ph.D., Microbiology, Oregon State University

### Academic Appointments:

2013-Present: Assistant Professor, National Cheng Kung University  
2009-2012: Research Fellow, The University of Texas Health Science Center at Houston  
2007-2009: Research Fellow, University of Oklahoma Health Sciences Center

### Awards and Honors:

### Research Support:

### Selected Publications:

1. Kang CY, Huang IH, Chou CC, Wu TY, Chang JC, Hsiao YY, Cheng CH, Tsai WJ, Hsu KC, Wang S. Functional analysis of *Clostridium difficile* sortase B reveals key residues for catalytic activity and substrate specificity. *J Biol Chem*. 2020 Mar 13;295(11):3734-3745. doi: 10.1074/jbc.RA119.011322. Epub 2020 Jan 31. PMID: 32005667; PMCID: PMC7076211.
2. Chen KY, Rathod J, Chiu YC, Chen JW, Tsai PJ, Huang IH. The Transcriptional Regulator Lrp Contributes to Toxin Expression, Sporulation, and Swimming Motility in *Clostridium difficile*. *Front Cell Infect Microbiol*. 2019 Oct 17;9:356. doi: 10.3389/fcimb.2019.00356. PMID: 31681632; PMCID: PMC6811523.
3. Chen JS, Hsu TK, Hsu BM, Chao SC, Huang TY, Ji DD, Yang PY, Huang IH. Swimming Pool-Associated Vittaforma-Like Microsporidia Linked to Microsporidial

- Keratoconjunctivitis Outbreak, Taiwan. *Emerg Infect Dis.* 2019 Nov;25(11):2100-2103. doi: 10.3201/eid2511.181483. PMID: 31625849; PMCID: PMC6810191.
4. Wong TW, Liao SZ, Ko WC, Wu CJ, Wu SB, Chuang YC, Huang IH. Indocyanine Green-Mediated Photodynamic Therapy Reduces Methicillin-Resistant *Staphylococcus aureus* Drug Resistance. *J Clin Med.* 2019 Mar 25;8(3):411. doi: 10.3390/jcm8030411. PMID: 30934605; PMCID: PMC6463108.
  5. Chang C, Amer BR, Osipiuk J, McConnell SA, Huang IH, Hsieh V, Fu J, Nguyen HH, Muroski J, Flores E, Ogorzalek Loo RR, Loo JA, Putkey JA, Joachimiak A, Das A, Clubb RT, Ton-That H. In vitro reconstitution of sortase-catalyzed pilus polymerization reveals structural elements involved in pilin cross-linking. *Proc Natl Acad Sci U S A.* 2018 Jun 12;115(24):E5477-E5486. doi: 10.1073/pnas.1800954115. Epub 2018 May 29. PMID: 29844180; PMCID: PMC6004493.
  6. Hong YP, Wang YW, Huang IH, Liao YC, Kuo HC, Liu YY, Tu YH, Chen BH, Liao YS, Chiou CS. Genetic Relationships among Multidrug-Resistant *Salmonella enterica* Serovar Typhimurium Strains from Humans and Animals. *Antimicrob Agents Chemother.* 2018 Apr 26;62(5):e00213-18. doi: 10.1128/AAC.00213-18. PMID: 29581119; PMCID: PMC5923113.
  7. Yang HT, Chen JW, Rathod J, Jiang YZ, Tsai PJ, Hung YP, Ko WC, Paredes-Sabja D, Huang IH. Lauric Acid Is an Inhibitor of *Clostridium difficile* Growth *in Vitro* and Reduces Inflammation in a Mouse Infection Model. *Front Microbiol.* 2018 Jan 17;8:2635. doi: 10.3389/fmicb.2017.02635. PMID: 29387044; PMCID: PMC5776096.
  8. Suzuki H, Tomita M, Tsai PJ, Ko WC, Hung YP, Huang IH, Chen JW. Comparative genomic analysis of *Clostridium difficile* ribotype 027 strains including the newly sequenced strain NCKUH-21 isolated from a patient in Taiwan. *Gut Pathog.* 2017 Nov 29;9:70. doi: 10.1186/s13099-017-0219-4. PMID: 29213333; PMCID: PMC5708112.
  9. Liu YW, Chen YH, Chen JW, Tsai PJ, Huang IH. Immunization with Recombinant TcdB-Encapsulated Nanocomplex Induces Protection against *Clostridium difficile* Challenge in a Mouse Model. *Front Microbiol.* 2017 Jul 25;8:1411. doi: 10.3389/fmicb.2017.01411. PMID: 28790999; PMCID: PMC5525027.
  10. Zhou P, Li X, Huang IH, Qi F. Veillonella Catalase Protects the Growth of *Fusobacterium nucleatum* in Microaerophilic and *Streptococcus gordonii*-Resident Environments. *Appl Environ Microbiol.* 2017 Sep 15;83(19):e01079-17. doi: 10.1128/AEM.01079-17. PMID: 28778894; PMCID: PMC5601340.
  11. Hung YP, Lee JC, Lin HJ, Chiu CW, Wu JL, Liu HC, Huang IH, Tsai PJ, Ko WC. Perceptions of *Clostridium difficile* infections among infection control professionals in Taiwan. *J Microbiol Immunol Infect.* 2017 Aug;50(4):521-526. doi: 10.1016/j.jmii.2017.02.005. Epub 2017 Jun 29. PMID: 28728905.
  12. Yin JC, Fei CH, Lo YC, Hsiao YY, Chang JC, Nix JC, Chang YY, Yang LW, Huang IH, Wang S. Structural Insights into Substrate Recognition by *Clostridium difficile* Sortase. *Front Cell Infect Microbiol.* 2016 Nov 22;6:160. doi: 10.3389/fcimb.2016.00160. PMID: 27921010; PMCID: PMC5118464.
  13. Hung YP, Huang IH, Lin HJ, Tsai BY, Liu HC, Liu HC, Lee JC, Wu YH, Tsai PJ, Ko WC. Predominance of *Clostridium difficile* Ribotypes 017 and 078 among Toxigenic Clinical Isolates in Southern Taiwan. *PLoS One.* 2016 Nov 18;11(11):e0166159. doi: 10.1371/journal.pone.0166159. PMID: 27861606; PMCID: PMC5115699.

