



郭致榮 Kuo, Chih-Jung

Professor

Specialty:

Molecular microbiology, Bacteriology, Biochemistry

Courses Taught:

Undergraduate: Veterinary bacteriology, Medical Biochemistry

Graduate: Advanced Biochemistry, Fundamental Microbiology
(Taught in English), Seminar

Tel: 04-2284-0894 ext 535 or 503

E-mail: ck476@nchu.edu.tw

Education background

Ph.D., Institute of Biomedical Sciences, National Taiwan University and Taiwan International Graduate Program, Academia Sinica 2005.09-2009.06

Current Position and Professional Career

Associate Professor, National Chung-Hsing University 2022.02-2023.02

Assistant Professor, National Chung-Hsing University 2013.08-2020.02

Postdoctoral Associate & Research Associate, College of Veterinary Medicine, Cornell University 2009.07-2013.08

Research Assistant, Academia Sinica 2002.01-2006.04

Honors

Elite Veterinary Award for Outstanding Teaching and Research, Dr. Robert C. T. Lee Foundation, Taiwan (2022)

Distinguished Faculty III, National Chung Hsing University, Taiwan (2020-2022; 2022-2024)

Short-term Domestic Visiting Scholars to Academia Sinica (2015; 2020)

Research Interest:

Functional analysis and inhibitor development of SARS-CoV-2 and Feline CoV proteases

Bacterial virulence factors and pathogenesis

Development of pathogen detection kits & Study on gut microbiota of companion animals

Publications (Selected SCI publications after 2012)

1. Li Y, Xu W, Ren Y, Cheung HC, Huang P, Kaur G, **Kuo CJ**, McDonough SP, Fubini SL, Lipkin SM, Deng X, Chang YF, Huang L. Plakoglobin and High-Mobility Group Box 1 Mediate Intestinal Epithelial Cell Apoptosis Induced by Clostridioides difficile TcdB. *mBio*, 2022;13(5); e0184922.
2. **Kuo CJ**#, Liang PH#. (#corresponding authors) SARS-CoV-2 3CLpro displays faster selfmaturation in vitro than SARS-CoV 3CLpro due to faster C-terminal cleavage. *FEBS Lett.* 2022;596(9),1214-1224.
3. Yu PC, Huang CH, **Kuo CJ**, Liang PH, Wang LH, Pan MY, Chang SY, Chao TL, Jeong SM, Fang JT, Huang HC*, Juan HF*. Drug repurposing for the identification of compounds with anti-SARS-CoV-2 capability via multiple targets. *Pharmaceutics*, 2022;14(1),176.
4. Lee JY*, **Kuo CJ***, Shin JS, Jung E, Liang PH, Jung YS. (*equal contribution) Identification of non-covalent 3C-like protease inhibitors against severe acute respiratory syndrome coronavirus-2 via virtual screening of a Korean compound library. *Bioorg Med Chem Lett.* 2021;42:128067.
5. **Kuo CJ**, Chao TL, Kao HC, Tsai YM, Liu YK, Wang LH, Hsieh MC, Chang SY, Liang PH. Kinetic Characterization and Inhibitor Screening for the Proteases Leading to Identification of Drugs against SARS-CoV-2. *Antimicrob Agents Chemother.* 2021;65(4):e02577-20
6. Chen CC*, Yu X*, **Kuo CJ***, Min J, Chen S, Ma L, Liu K, Guo RT. (*equal contribution) Overview of antiviral drug candidates targeting coronaviral 3C-like main proteases. *FEBS*

J. 2021 Jan 5. doi: 10.1111/febs.15696. Online ahead of print.

7. Pathak N, Chen YT, Hsu YC, Hsu NY, **Kuo CJ**, Tsai HP, Kang JJ, Huang CH, Chang SY, Chang YH, Liang PH, Yang JM. Uncovering Flexible Active Site Conformations of SARS-CoV-2 3CL Proteases through Protease Pharmacophore Clusters and COVID-19 Drug Repurposing. *ACS Nano*. 2021;15(1):857-872
8. Theerawatanasirikul S, **Kuo CJ**#, Phecharat N, Chootip J, Lekcharoensuk C, Lekcharoensuk P#. (#corresponding authors) Structural-based virtual screening and in vitro assays for small molecules inhibiting the feline coronavirus 3CL protease as a surrogate platform for coronaviruses. *Antiviral Res*. 2020 ;182:104927
9. Lin WC, Ptak CP, Chang CY, Ian, MK, Chia MY, Chen TH, **Kuo CJ**. Autochthonous lactic acid bacteria isolated from dairy cow feces exhibiting promising probiotic properties and in vitro antibacterial activity against foodborne pathogens in cattle. *Front. Vet. Sci*. 2020; 15;7:239.7:239
10. Wu CW, Wu TY, **Kuo CJ**, Lu YP, Chien MS, Huang C. Characterization of the monoclonal antibody specific to the ORF72 protein of koi herpesvirus and cellular distribution analysis of the viral protein. *J Fish Dis*. 43(7):791-799
11. Li T, Zhang Y, Dong K, **Kuo CJ**, Li C, Zhu YQ, Qin J, Li QT, Chang YF, Guo X, Zhu Y. Isolation and Characterization of the Novel Phage JD032 and Global Transcriptomic Response during JD032 Infection of *Clostridioides difficile* Ribotype 078. *mSystems*. 2020; 5(3):e00017-20
12. Hou FH, Lee WC, Liao JW, Chien MS, **Kuo CJ**, Chung HP, Chia MY. Evaluation of a type 2 modified live porcine reproductive and respiratory syndrome vaccine against heterologous challenge of a lineage 3 highly virulent isolate in pigs. *PeerJ*. 2020; 8:e8840
13. Theerawatanasirikul S, **Kuo CJ**#, Phetcharat N, Lekcharoensuk P# (#corresponding authors). In silico and in vitro analysis of small molecules and natural compounds targeting the 3CL protease of feline infectious peritonitis virus. *Antiviral Res*. 2020; 174:104697
14. **Kuo CJ**, Gao J, Huang JW, Ko TP, Zhai C, Ma L, Liu W, Dai L, Chang YF, Chen TH, Hu Y, Yu X, Guo RT, Chen CC. Functional and structural investigations of fibronectin-binding protein Apa from *Mycobacterium tuberculosis*. *Biochimica et Biophysica Acta-General Subjects*. 2019;1863(2019):1351-1359
15. Lin YF, Tseng IJ, **Kuo CJ**, Lin HY, Chiu IJ, Chiu HW. High-level expression of ARID1A predicts a favourable outcome in triple-negative breast cancer patients receiving paclitaxel-based chemotherapy. *J Cell Mol Med*. 2018; 22(4):2458-2468.
16. Liao SW, Lee JJ, Ptak CP, Wu YC, Hsuan SL, **Kuo CJ**#, Chen TH# (#corresponding authors). Effects of L-arabinose efflux on λ Red recombination-mediated gene knockout in multiple-antimicrobial-resistant *Salmonella enterica* serovar Choleraesuis. *Archives of Microbiology*. 2018; (2):219-225.
17. Huang SP, Liu PY, **Kuo CJ**, Chen CL, Lee WJ, Tsai YH, Lin YF. The G α h-PLC δ 1 signaling axis drives metastatic progression in triple-negative breast cancer. *Journal of Hematology & Oncology*, 2017; 10(1):114
18. Hsieh CL, Tseng A, He H, **Kuo CJ**, Wang X, Chang YF. Leptospira Immunoglobulin-like Protein B Interacts with the 20th Exon of Human Tropoelastin Contributing to Leptospiral Adhesion to Human Lung Cells. *Frontiers in Cellular and Infection Microbiology*. 2017; 7:163
19. Gao J, Huang JW, Li Q, Liu W, Ko TP, Zheng Y, Xiao X, **Kuo CJ**, Chen CC, Guo RT. Characterization and crystal structure of a thermostable glycoside hydrolase family 45 1,4- β -endoglucanase from *Thielavia terrestris*. *Enzyme Microb Technol*. 2017; 99:32-37
20. Wu YC, Chen CM, **Kuo CJ**, Lee JJ, Chen PC, Chang YC, Chen TH. Prevalence and molecular characterization of *Clostridium difficile* isolates from a pig slaughterhouse, pork, and humans in Taiwan. *Int J Food Microbiol*. 2017; 242:37-44
21. Lee JJ, Wu YC, **Kuo CJ**, Hsuan SL, Chen TH. TolC is important for bacterial survival and oxidative stress response in *Salmonella enterica* serovar Choleraesuis in an acidic environment. *Vet Microbiol*. 2016; 193:42-48
22. Huang JW, Liu W, Lai HL, Cheng YS, Zheng Y, Li Q, Sun H, **Kuo CJ**, Guo RT, Chen CC. Crystal structure and genetic modifications of FI-CMCase from *Aspergillus aculeatus* F-50. *Biochem Biophys Res Commun*. 2016 478(2):565-72
23. Lee JJ, Hsuan SL, **Kuo CJ**, Wu YC, Chen TH. MarA and ramA regulate virulence in *Salmonella enterica* serovar Choleraesuis. *Vet Microbiol*. 2015; 81(3-4):323-7
24. **Kuo CJ**#, Liang PH# (#corresponding authors). Characterization and Inhibition of the 3C-like Protease of Severe Acute Respiratory Syndrome Coronavirus. *ChemBioEng Reviews*. 2015; 22(2):118-132
25. Han X, Chen CC, **Kuo CJ**, Huang CH, Zheng Y, Ko TP, Zhu Z, Feng X, Wang K, Oldfield E, Wang AH, Liang PH, Guo RT, Ma Y. Crystal structures of ligand-bound octaprenyl pyrophosphate synthase from *Escherichia coli* reveal the catalytic and chain-length

determining mechanisms. *Proteins*. 2015; 83(1):37-45

26. **Kuo CJ**, Ptak CP, Hsieh CL, Akey BL, Chang YF. Elastin, a Novel Extracellular Matrix Protein Adhering to Mycobacterial Antigen 85 Complex. *J Biol Chem*. 2013; 288(6):3886-96
27. **Kuo CJ**, Bell H, Hsieh CL, Ptak CP, Chang YF. The novel Mycobacteria antigen 85 complex binding motif on Fibronectin. *J Biol Chem*. 2012; 287(3):1892-902

PubMed link: <https://www.ncbi.nlm.nih.gov/pubmed/?term=chih+jung+kuo>

Book and Book Chapters

Ptak CP, **Kuo CJ**, Chang YF. **Moonlighting Proteins: Novel Virulence Factors in Bacterial Infections** Ch. 20 Mycobacterium tuberculosis Antigen 85 Family Proteins: Mycolyl Transferases and Matrix Binding Adhesins.

ISBN 10: 1118951115; ISBN 13: 9781118951118 Publisher: Wiley-Blackwell, 2016

Patents

Liang PH, **Kuo CJ**, Shih YP. **Protein expression system involving mutated severe respiratory syndrome-associated coronavirus 3C-like protease**. US patent number: US8053222