

Name: Dr. Nisanart Charoenlap

Office address: Research Laboratory of Biotechnology, Chulabhorn Research Institute,
54 Kamphaeng Phet 6 Talat Bang Khen, Lak Si, Bangkok 10210, Thailand
Tel: +662-5538555 ext. 8557 (office)



Positions: Senior Research Scientist 2, Research Laboratory of Biotechnology, Chulabhorn Research Institute

E-mail: nisanart@cri.or.th

Research Interests

1. Microbiology
2. Bacterial genetics
3. Biotechnology
4. Antimicrobial resistance (AMR)
5. Environmental pollutants on AMR

Education and Degrees

- Mahidol University, Bangkok
 - Ph.D. in Biotechnology, 2007-2009 (Royal Golden Jubilee Scholarship funded by Thailand Research Fund)
 - M.Sc. in Biotechnology, 2002-2006 (Graduate studies Scholarship funded by Ministry of University Affair and Faculty of Graduate studies, Mahidol University)
 - B.Sc. in Biotechnology, 1999-2002 (Srirangtong Scholarship funded by Faculty of Science, Mahidol University)

Working Experiences

- Visiting Ph.D. student at Department of Food Sciences, University of California, Davis, USA (UC, Davis) (under supervision of Prof. Chester W. Price U.S.A., 2004)
- Post doctoral Fellow at Department of Biological Engineering, Massachusetts Institute of Technology (MIT), U.S.A., 2007-2009 (with Prof. David B. Schauer)
- Project Manager for One Health Drivers of Antibacterial Resistance in Thailand (OH-DART) funded by Medical Research Council (MRC), UK, 2018-2022

Academic Positions

- Research Scientist, Research Laboratory of Biotechnology, 2009-2015
- Research Scientist I, Research Laboratory of Biotechnology, 2016-2022
- Research Scientist II, Research Laboratory of Biotechnology, 2022-present

Publications

1. **Charoenlap, N.**, Dharmsthiti, S., Sirisansaneeyakul, S., and Lertsiri, S. Optimization of cyclodextrin production from sago starch. *Bioresour Technol.* 2004; 92: 49-54.
2. Sukchawalit, R., Prapagdee, B., **Charoenlap, N.**, Vattanaviboon, P. and Mongkolsuk S. Protection of *Xanthomonas* against arsenic toxicity involves the peroxide-sensing transcription regulator OxyR. *Res Microbiol.* 2005;156:30-4.

3. **Charoenlap, N.**, Eiamphungporn, W., Chauvatcharin, N., Utamapongchai, S. Vattanaviboon, P. and Mongkolsuk S. OxyR mediated compensatory expression between *ahpC* and *katA* and the significance of *ahpC* in protection from hydrogen peroxide in *Xanthomonas campestris*. FEMS Microbiol Lett. 2005; 249: 73-8.
4. Eiamphungporn, W., **Charoenlap, N.**, Vattanaviboon, P. and Mongkolsuk, S. *Agrobacterium tumefaciens* *soxR* is involved in superoxide stress protection and also directly regulates superoxide-inducible expression of itself and a target gene. J Bacteriol. 2006;188: 8669-73.
5. Nawapan, S., **Charoenlap, N.**, Charoenwuttitarn, A., Saenkham, P., Mongkolsuk, S., Vattanaviboon, P. Functional and expression analyses of the *cop* operon, required for copper resistance in *Agrobacterium tumefaciens*. J. Bacteriol. 2009;191: 5159-68.
6. Patikarnmonthorn, N., Nawapan, S, Buranajitpakorn, S., **Charoenlap, N.**, Mongkolsuk, S., Vattanaviboon, P. Copper ions potentiate organic hydroperoxide and hydrogen peroxide toxicity through different mechanisms in *Xanthomonas campestris* pv. *campestris*. FEMS Microbiol Lett. 2010; 313(1):75-80.
7. Buranajitpakorn, S., Piwkam, A., **Charoenlap, N.**, Vattanaviboon, P., and Mongkolsuk, S. Genes for hydrogen peroxide detoxification and adaptation contribute to protection against heat stress in *Xanthomonas campestris* pv. *campestris*. FEMS Microbiol Lett. 2011;317(1):60-6.
8. **Charoenlap, N.**, Buranajitpakorn, S., Daung-nkern, J., Namchaiw, P., Vattanaviboon, P. and Mongkolsuk S. Evaluation of the virulence of *Xanthomonas campestris* pv. *campestris* mutant strains that lacking functional genes in the OxyR regulon. Curr Microbiol. 2011;63(2):232-7.
9. Mahaviahakanont, A., **Charoenlap, N.**, Namchaiw, P., Eiamphungporn, W., Chattrakarn, S., Vattanaviboon, P., Mongkolsuk, S. Novel roles of SoxR, a transcriptional regulator from *Xanthomonas campestris*, in sensing redox-cycling drugs and regulating a protective gene that have overall implications for bacterial stress physiology and virulence on a host plant. J Bacteriol. 2012;194(2):209-17.
10. **Charoenlap, N.**, Shen Z., McBee ME., Muthupalani S., Wogan GN., Fox JG., Schauer DB. Alkyl hydroperoxide reductase is required for *Helicobacter cinaedi* intestinal colonization and survival under oxidative stresses in BALB/c and BALB/c IL10^{-/-} mice. Infect. Immun. 2012;80(3):921-8.
11. Leesukon, P. Wirathorn, W., Chuchue, T. **Charoenlap, N.** and Mongkolsuk, S. The selectable antibiotic marker, *tetA(C)*, increases *Pseudomonas aeruginosa* susceptibility to the herbicide/superoxide generator, paraquat. Arch Microbiol. 2013;195(9):671-4.
12. Sornchuer, P., Namchaiw, P., Kerdwong, J., **Charoenlap, N.**, Mongkolsuk, S., Vattanaviboon, P. Copper chloride induces antioxidant gene expression but reduces ability to mediate H₂O₂ toxicity in *Xanthomonas campestris*. Microbiology.2014;160(Pt 2):458-66.
13. **Charoenlap, N.**, Sornchuer, P., Piwkam, A., Srijaruskul, K., Mongkolsuk, S., Vattanaviboon P. The roles of peroxide protective regulons in protecting *Xanthomonas campestris* pv. *campestris* from sodium hypochlorite stress. Can J Microbiol. 2015 May;61(5):343-50. doi: 10.1139/cjm-2014-0792. Epub 2015 Mar 6.
14. Srijaruskul, K., **Charoenlap, N.**, Namchaiw, P., Chattrakarn, S., Giengkam, S., Mongkolsuk, S., Vattanaviboon, P. Regulation by SoxR of *mfsA*, Which Encodes a Major Facilitator Protein Involved in Paraquat Resistance in *Stenotrophomonas maltophilia*. PLoS One. 2015 Apr 27;10(4):e0123699. doi: 10.1371/journal.pone.0123699. eCollection 2015.

15. Dulyayangkul, P., **Charoenlap, N.**, Srijaruskul, K., Mongkolsuk, S., Vattanaviboon, P. Major facilitator superfamily MfsA contributes to multidrug resistance in emerging nosocomial pathogen *Stenotrophomonas maltophilia*. J Antimicrob Chemother. 2016 Jun 21. Doi:10.1093/jac/dkw233
16. Rittiroongrad, S., **Charoenlap, N.**, Giengkam, S., Vattanaviboon, P., Mongkolsuk, S. *Agrobacterium tumefaciens estC*, encoding an Eenzyme containing esterase activity, is regulated by EstR, a regulator in the MarR family. PLoS One. 2016 Dec 30;11(12):e0168791. doi: 10.1371/journal.pone.0168791. eCollection 2016.
17. Chanhom, P., **Charoenlap, N.**, Tomapatanaget, B., Insin, N. Colloidal titania-silica-iron oxide nanocomposites and the effect from silica thickness on the photocatalytic and bactericidal activities. JMM. 2017(427);60-66.
18. Panmanee, W., **Charoenlap, N.**, Atichartpongkul, S., Mahavihakanont, A., Whiteside, MD., Winsor, G., Brinkman, FSL., Mongkolsuk, S., Hassett, DJ. The OxyR-regulated *phnW* gene encoding 2-aminoethylphosphonate:pyruvate aminotransferase helps protect *Pseudomonas aeruginosa* from *tert*-butyl hydroperoxide. PLoS One. 2017 Dec 7;12(12):e0189066. doi: 10.1371/journal.pone.0189066. eCollection 2017.
19. Vattanaviboon, P., Dulyayangkul, P., Mongkolsuk, S., **Charoenlap, N.** Overexpression of *Stenotrophomonas maltophilia* major facilitator superfamily protein MfsA increases resistance to fluoroquinolone antibiotics. J Antimicrob Chemother. 2018(73);1263-66.
20. Chanhom, P., **Charoenlap, N.**, Manipuntee, C., Insin, N. Metalloporphyrins-sensitized titania-silica-iron oxide nanocomposites with high photocatalytic and bactericidal activities under visible light irradiation. JMM. 2018(475);602-610.
21. **Charoenlap, N.**, Jiramonai, L., Chittrakanwong, J., Tunsakul, N., Mongkolsuk, S., Vattanaviboon, P. Inactivation of *ahpC* renders *Stenotrophomonas maltophilia* resistant to the disinfectant hydrogen peroxide. Antonie Van Leeuwenhoek_ 2019 (112);809-814.
22. Chittrakanwong, J*, **Charoenlap, N.***, Mongkolsuk, S., and Vattanaviboon, P. *mfsQ* encoding an MFS efflux pump mediates adaptive protection of *Stenotrophomonas maltophilia* against benzalkonium chloride. 2020(5);1-5.
23. Dulyayangkul, P., Satapoomin, N., Avison, M. B., **Charoenlap, N.**, Vattanaviboon, P., and Mongkolsuk, S. Over-Expression of Hypochlorite Inducible Major Facilitator Superfamily (MFS) Pumps Reduces Antimicrobial Drug Susceptibility by Increasing the Production of MexXY Mediated by ArmZ in *Pseudomonas aeruginosa*. Frontier in Microbiology. 2020(12);11:592153.
24. Chittrakanwong, J*, **Charoenlap, N.***, Vanitshavit, V., Sowatad, A., Mongkolsuk, S., Vattanaviboon, P. The role of MfsR, a TetR-type transcriptional regulator, in adaptive protection of *Stenotrophomonas maltophilia* against benzalkonium chloride via the regulation of *mfsQ*. FEMS Microbiol Lett. 2021(15);368:fnab098.
25. Boonyakanog, A*, **Charoenlap, N.***, Chattrakarn, S., Vattanaviboon, P., Mongkolsuk, S. Contribution of *Stenotrophomonas maltophilia* MfsC transporter to protection against diamide and the regulation of its expression by the diamide responsive repressor DitR. PLoS One. 2022;17(8):e0272388.

26. Chatree, Y., **Charoenlap, N.***, Vanitshavit, V., Ruangrassamee, P., Mongkolsuk, S., and Vattanaviboon. Induction of antimicrobial resistance of *Stenotrophomonas maltophilia* by exposure to non-lethal levels of antibiotics. Microb. Drug Resist. In press