Research Area

ผศ.ดร. โศภิศ คันธวงศ์ (Asst. Prof. Sophit Khanthawong)

- **Medical Mycology**
- **Virulence factors of pathogenic fungi**
- **Diagnosis and identification of pathogenic fungi (*Talaromyces marneffei*, *Candida albicans*, Dermatophytes and Tinea versicolor)**
- **Protein expression in yeast system**
- **Antifungal activity from natural products**

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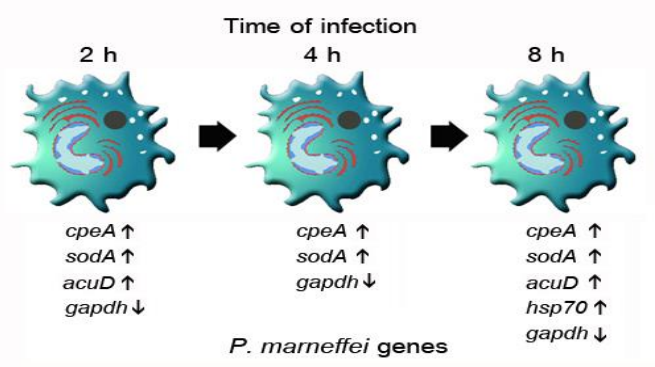
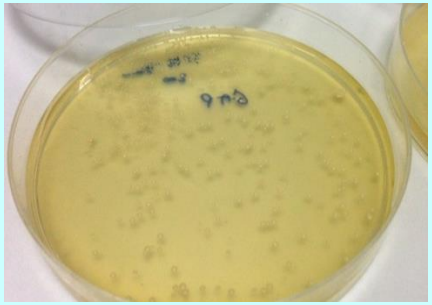
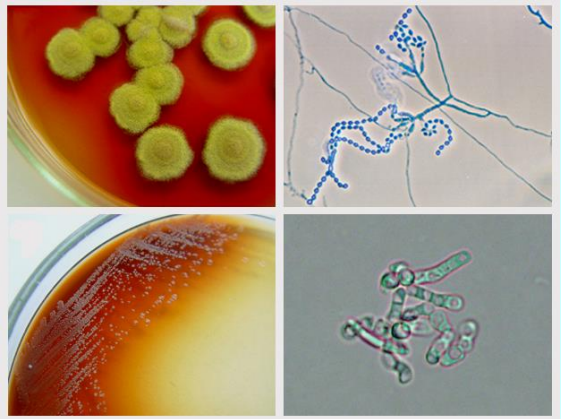
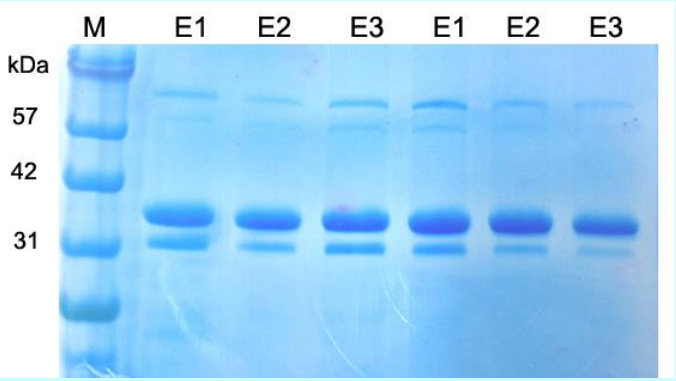
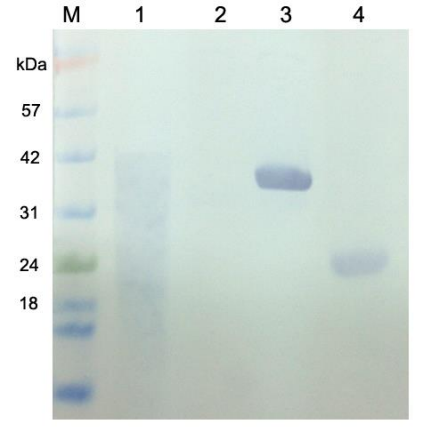






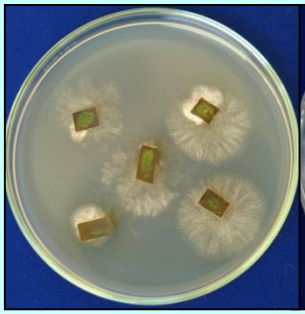
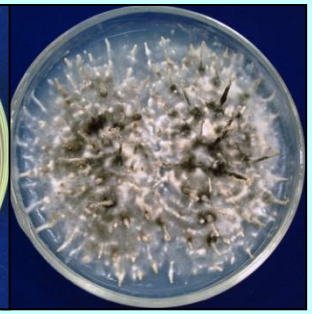


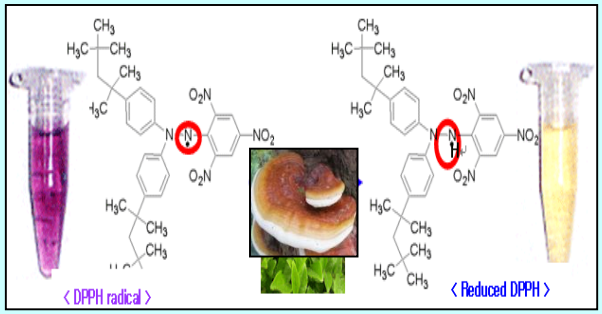


Research Area

อาจารย์อุรัตน์ พิมลศรี

- งานวิจัยด้านชีววิทยาของเห็ดรา และราเอนโดไฟต์
- สารออกฤทธิ์ทางชีวภาพของเห็ดรา เช่น Antioxidant activity, Antimicrobial activity



ห้องทำงาน MD 226 โทรศัพท์ 055-964624 E-mail: uratp@yahoo.com

Immunology

ผศ.ดร. ดวงกมล ขันธเลิศ

ผศ. ดร. ชาคริต สวัสดิดล

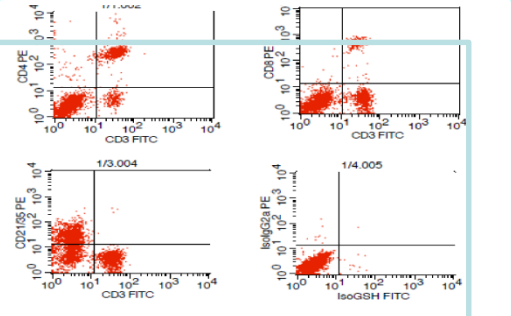
ดร. จตุพร เงินคำ

Research Area

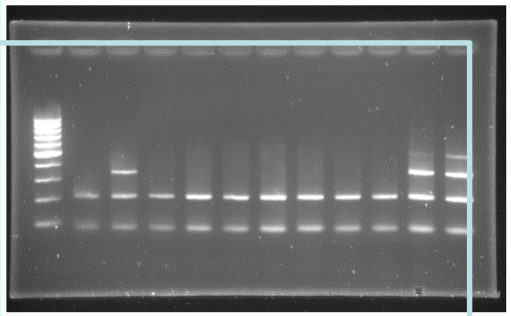
ผศ. ดร. ดวงกมล ขันธเลิศ (Asst. Prof. Duangkamol Kunthalert)

- ☆ **Immunomodulatory activities of selected natural products: *in vitro* and *in vivo***
- ☆ **Anti-inflammatory effects of bioactive peptides**
- ☆ **Nontypeable *Haemophilus influenzae* Biofilms**

Cytokine assay



Leukocyte subpopulations by Flow cytometry



Multiplex PCR

Lymphocyte preparation

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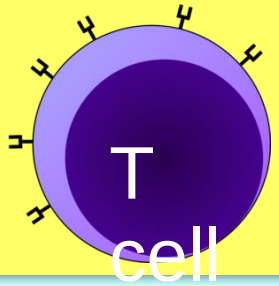
Research Area

ดร. จตุพร เงินคำ (Dr. Jatuporn Ngoenkam)

- <u>งานวิจัยด้านวิทยาภูมิคุ้มกันระดับโมเลกุล (molecular immunology)</u>
  - ความเกี่ยวข้องของโปรตีน Nck และ Lck ต่อการส่งสัญญาณบริเวณใกล้กับ TCR
- <u>งานวิจัยด้าน Signal transduction</u>
  - ความสำคัญของ actin polymerization ต่อการส่งสัญญาณภายใน T cell



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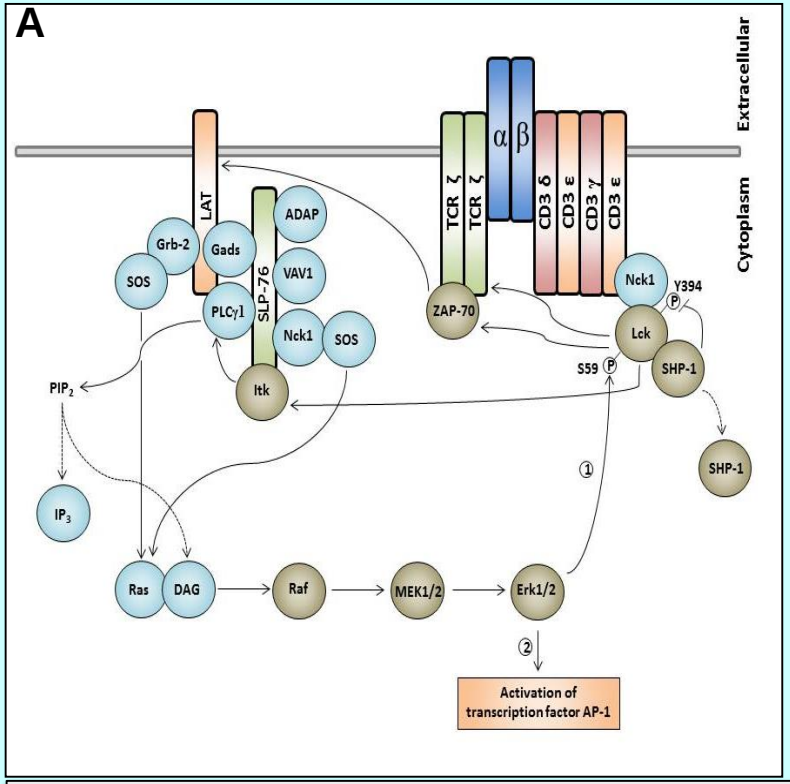
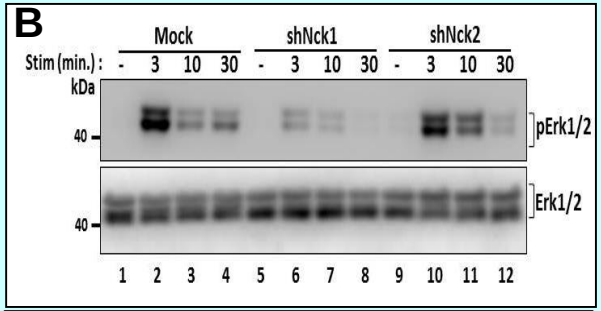
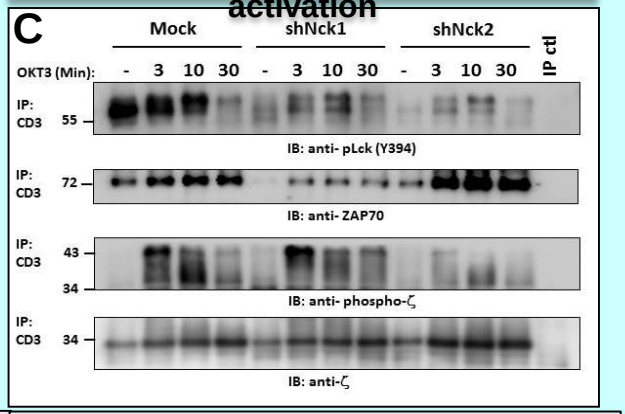


The model of Nck1 in TCR-mediated T cell activation



Nck1 is essential for Erk1/2 activation



Nck1 is required for TCR-proximal signalling

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Biofilms, Infection, and Antimicrobial Therapy

Research area

OPEN ACCESS Freely available online

PLoS one

Growing *Burkholderia pseudomallei* in Biofilm Stimulating Conditions Significantly Induces Antimicrobial Resistance

Chakrit Sawasdidoln[1,2], Suwimol Taweechaisupapong[1,4], Rasana W. Sermswan[1,3], Unchalee Tattawasart[1,2], Sumalee Tungpradabkul[5], Surasakdi Wongratanacheewin[1,2*]

1 Melioidosis Research Center, KhonKaen University, KhonKaen, Thailand, 2 Department of Microbiology, KhonKaen University, KhonKaen, Thailand, 3 Department of Biochemistry, KhonKaen University, KhonKaen, Thailand, 4 Department of Oral Diagnosis, KhonKaen University, KhonKaen, Thailand, 5 Department of Biochemistry, Mahidol University, Bangkok, Thailand

Abstract

Background: *Burkholderia pseudomallei*, a Gram-negative bacterium that causes melioidosis, was reported to produce biofilm. As the disease causes high relapse rate when compared to other bacterial infections, it therefore might be due to the reactivation of the biofilm forming bacteria which also provided resistance to antimicrobial agents. However, the mechanism on how biofilm can provide tolerance to antimicrobials is still unclear.

Methodology/Principal Findings: The change in resistance of *B. pseudomallei* to doxycycline, ceftazidime, imipenem, and trimethoprim/sulfamethoxazole during biofilm formation were measured as minimum biofilm elimination concentration (MBEC) in 50 soil and clinical isolates and also in capsule, flagellin, LPS and biofilm mutants. Almost all planktonic isolates were susceptible to all agents studied. In contrast, when they were grown in the condition that induced biofilm formation, they were markedly resistant to all antimicrobial agents even though the amount of biofilm production was not the same. The capsule and O-side chains of LPS mutants had no effect on biofilm formation whereas the flagellin-defective mutant markedly reduced in biofilm production. No alteration of LPS profiles was observed when susceptible form was changed to resistance. The higher amount of *N*-acyl homoserine lactones (AHLs) was detected in the high biofilm-producing isolates. Interestingly, the biofilm mutant which produced a very low amount of biofilm and was sensitive to antimicrobial agents significantly resisted those agents when grown in biofilm inducing condition.

Conclusions/Significance: The possible drug resistance mechanism of biofilm mutants and other isolates is not by having biofilm but rather from some factors that up-regulated when biofilm formation genes were stimulated. The understanding of genes related to this situation may lead us to prevent *B. pseudomallei* biofilms leading to the relapse of melioidosis.

Citation: Sawasdidoln C, Taweechaisupapong S, Sermswan RW, Tattawasart U, Tungpradabkul S, et al. (2010) Growing *Burkholderia pseudomallei* in Biofilm Stimulating Conditions Significantly Induces Antimicrobial Resistance. PLoS ONE 5(2): e9196. doi:10.1371/journal.pone.0009196

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Competing Interests: The authors have declared that no competing interests exist.

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Virology

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ผศ.ดร.สมชาย แสงอำนาจเดช

ผศ.ดร.บุญเรือง คำศรี

Research Lab

รศ.ดร.ดลฤดี สงวนเสริมศรี

- งานวิจัยด้านไวรัสวิทยาของไข้หวัดนกและวัคซีนป้องกันโรคไข้หวัดนกในสัตว์ปีก

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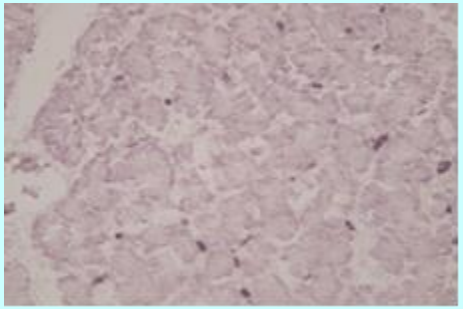
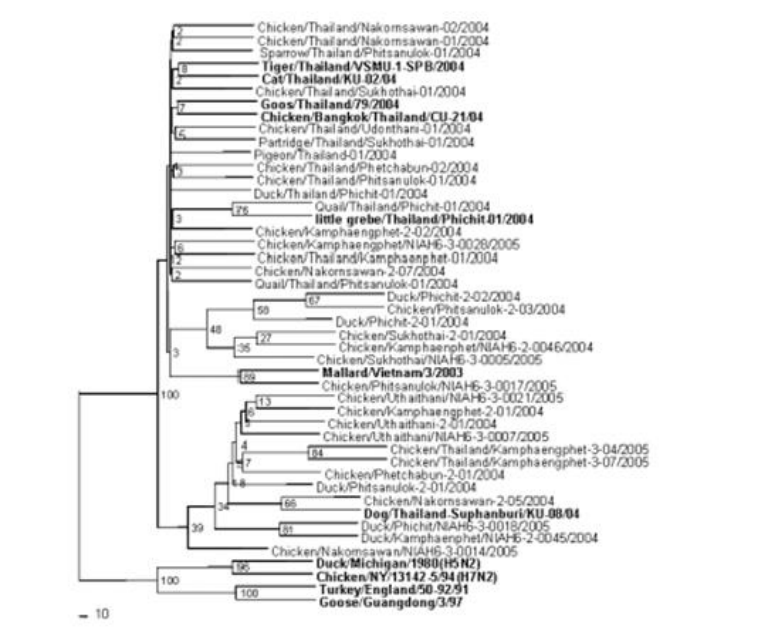
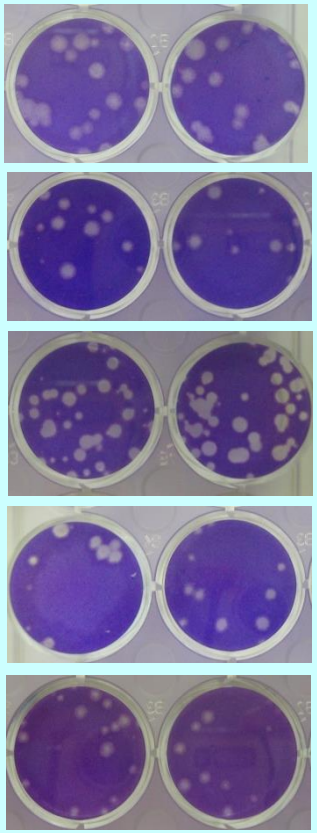


Chromogenic *in situ* hybridization locating HA gene of influenza A (H5N1) virus in pancreas of infected chicken



Phylogenetic analysis of NS gene of influenza A (H5N1) virus



A. A/PR/8/34(H1N1)

B. A/PR/8/34(H1N1) plus NS1 Thailand (H5N1 wild type)

C. A/PR/8/34(H1N1) plus NS1 Thailand (H5N1 NS1 L15F, D53G)

D. A/PR/8/34(H1N1) plus NS1 Thailand (H5N1 NS1 I171N)

E. A/PR/8/34(H1N1) plus NS1 Thailand (H5N1 NS1 E71K)

Plaque morphology of five reverse genetic viruses