

The SciKU Spectrum :  
**Diverse  
Research,  
United Vision**

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## VISION

"Excellence in Research and Innovation for Sustainable Development in ASEAN"

## MISSION

"To produce job-worthy graduates with high morals and ethics, to innovate excellent research for the national development and economic performance, and to expand community engagement through science"

## CORE VALUE



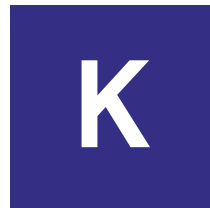
Sustainability



Creativity



Integrity



Knowledge



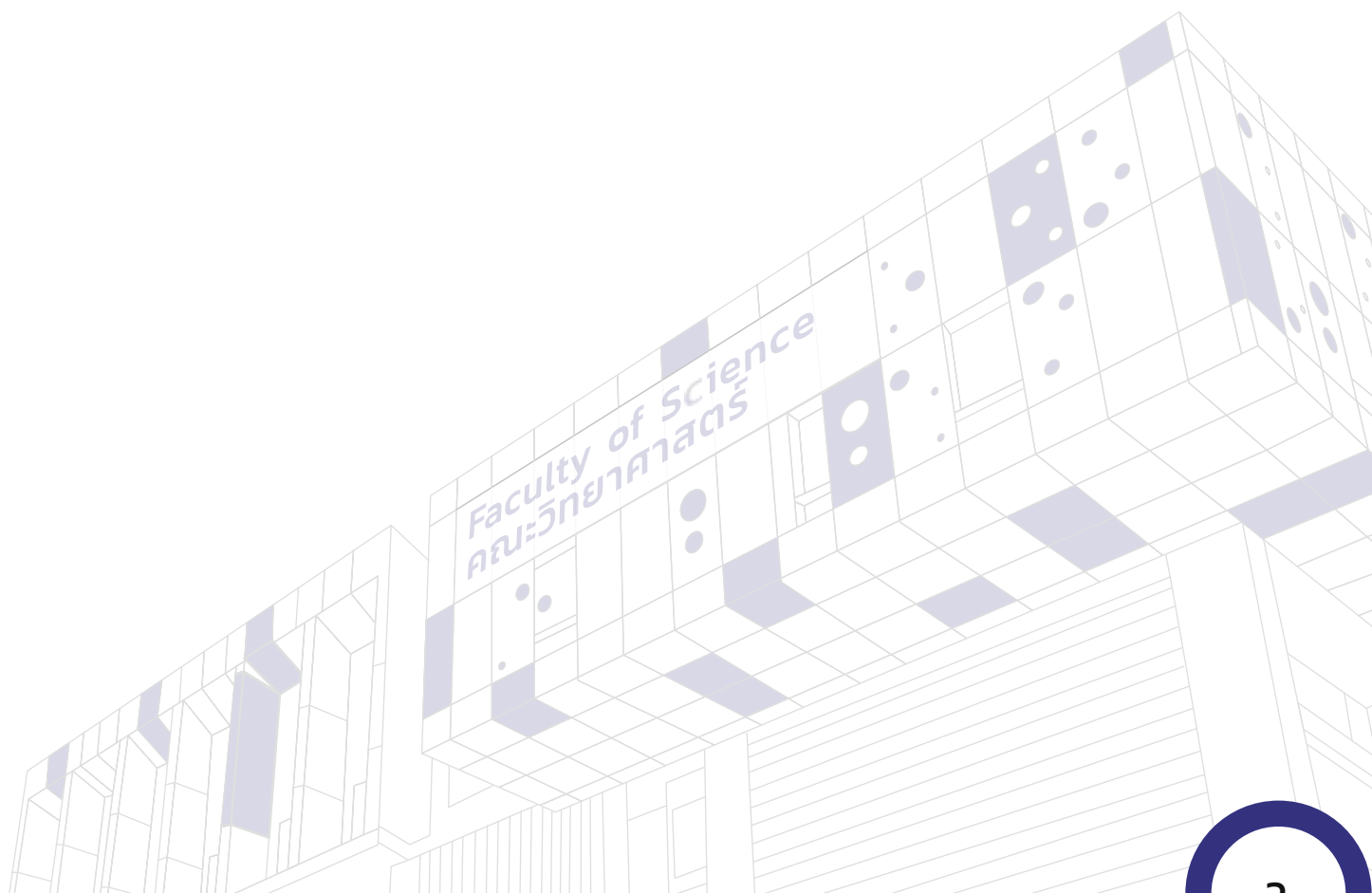
Unity

## MISSION

"To be a hub of knowledge in science and technology for academic community, to conduct research to generate new knowledge for scientific advancement, to produce graduates with employability skills, and to drive economy and improve quality of life in society through academic and research excellence"

# 1

## INNOVATIVE MATERIALS AND CUTTING-EDGE CATALYSIS



## INNOVATIVE MATERIALS AND CUTTING-EDGE CATALYSIS

At the Faculty of Science, Kasetsart University, our research on innovative materials and cutting-edge catalysis is leading the way in sustainable and advanced scientific solutions. Our focus includes the biosynthesis of nanoparticles for green agriculture and medical applications, utilizing supramolecular and coordination chemistry, and single-crystal X-ray diffraction to develop novel sensors and optical materials.

Our efforts in electrochemical conversion of agricultural waste and CO<sub>2</sub> into high-value chemicals aim to promote sustainable practices. We pioneer nanosensors and renewable materials for catalysts and electronic applications, including quantum dot-based colorimetric and luminescence sensors. Our innovative research extends to bio-based materials for electromagnetic interference (EMI) shielding and green electricity generation from renewable sources.

We excel in synthesizing plasmonic and magnetic nanoparticles, advanced heterogeneous catalysts for chemical reactions, and designing MOFs and coordination polymers for sensors and agricultural applications. Our commitment to advancing materials for energy storage and environmental sustainability ensures a future powered by innovative, eco-friendly solutions.



# Assoc. Prof. Nattanan Panjaworayan T-Thienprasert

Department of Biochemistry

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## Keywords

Key word: Medical Biochemistry, ZnO NPs biosynthesis, Molecular Biology, Cellular Biology.

Research focus :

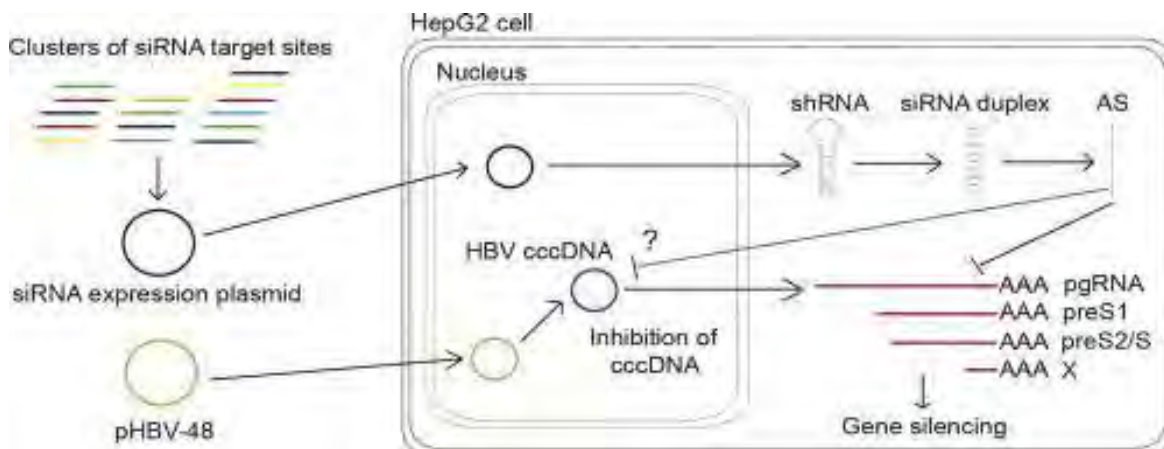
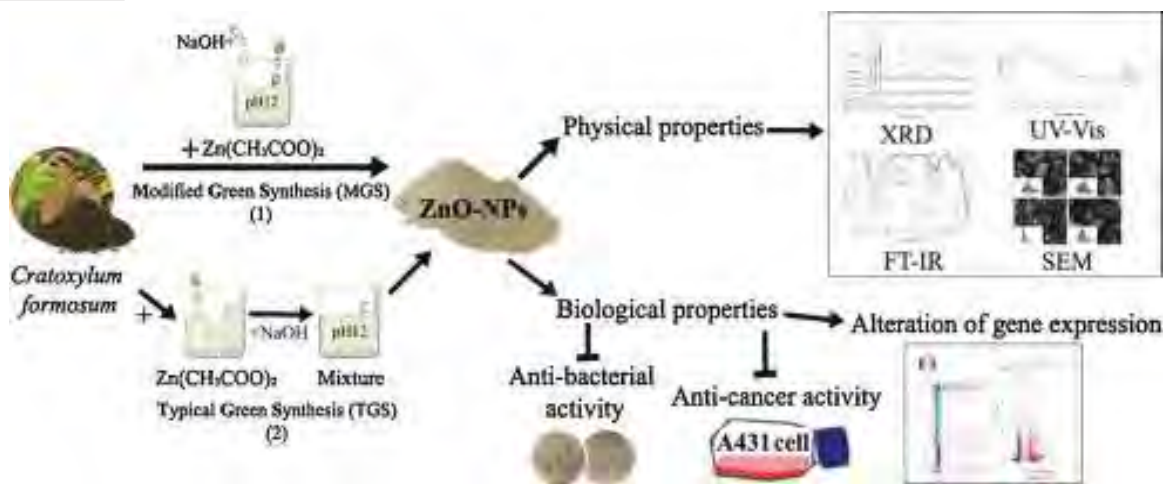
- Biosynthesis of nanoparticles for green agriculture and medical applications
- Evaluating the effects of natural products on the gene expression of cancer cells and pathogenic bacteria
- RNAi technology



57728750500



0000-0003-3520-8330





# Assoc. Prof. Boontana Wannalarse

Department of Chemistry

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## Keywords

Crystal structure,  
Fluorescence sensor,  
Electrochemical sensor,  
Anion and metal ion detection,  
Amino acid sensing.



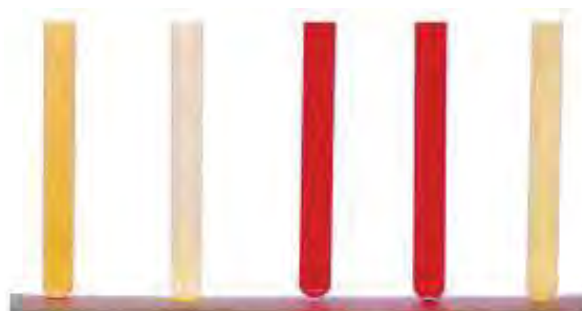
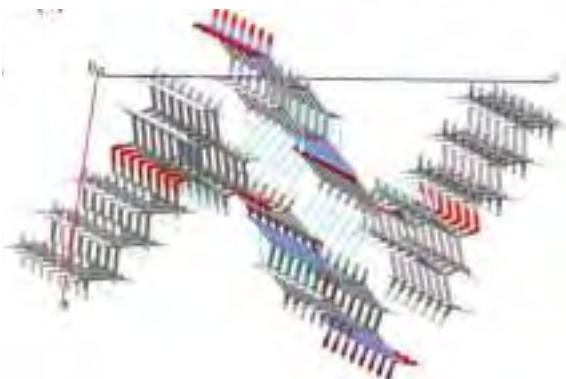
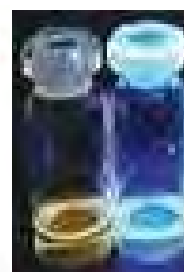
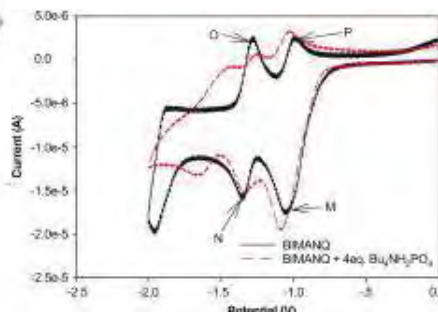
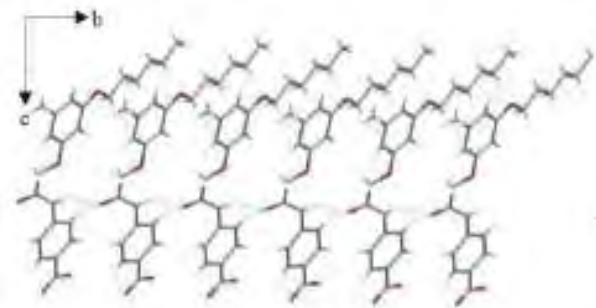
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## Research focuses

Supramolecular Chemistry, Coordination Chemistry,  
Single-crystal x-ray diffraction.

- Synthesis of electrochemical sensors based on anthraquinone derivatives for anion detection.
- Development of fluorescence sensors based on phenolic derivatives for metal ion detection.
- Synthesis and Crystal structure of optical sensors.





# Asst. Prof. Chaiya Prasittichai

Department of Chemistry

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## Keywords

Electrochemical Sensor, Electro-Catalyst, CO<sub>2</sub> Electrochemical Reduction, CO<sub>2</sub> Capture and Conversion, Surface Decoration

## Research field

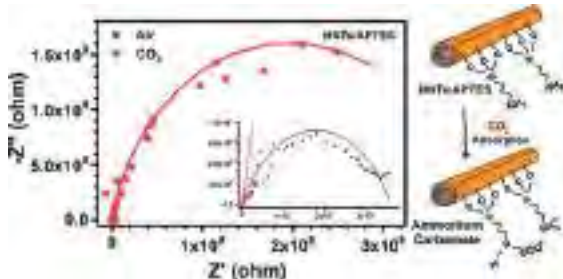
- Surface decoration and electrochemical sensor utilization
- Electrochemical conversion of agricultural waste to high-value chemicals
- Chemical and electrochemical conversion of CO<sub>2</sub> to high-value chemicals



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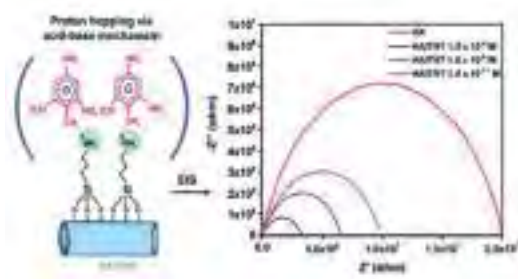


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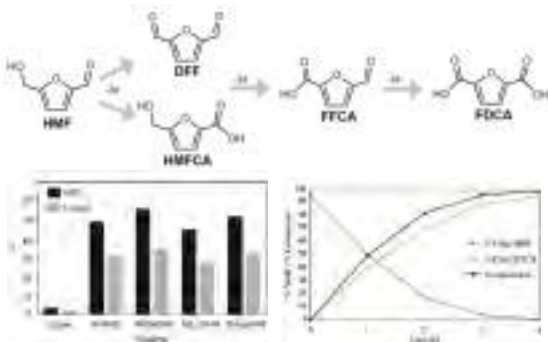
CO<sub>2</sub> sensor by surface modified HNT

ACS Appl. Nano Mater. 2021, 4, 4, 3686–3695

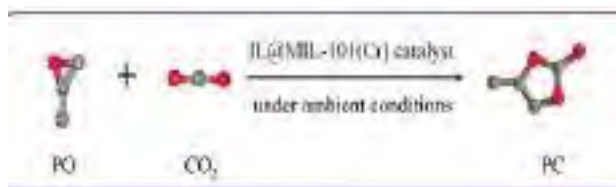


TNT sensor by surface modified HNT

RSC Adv., 2022,12, 17794–17802



Electrochemical conversion of HMF to FDCA by Ni-doped catalyst



CO<sub>2</sub> conversion to high-value chemicals by IL grafted MOF





# Asst. Prof. Junya Jettanasen

Department of Chemistry

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## Keywords

Nanomaterials, Piezocatalysis, Piezo-photocatalysis, Sensors, EMI shielding



56520141800



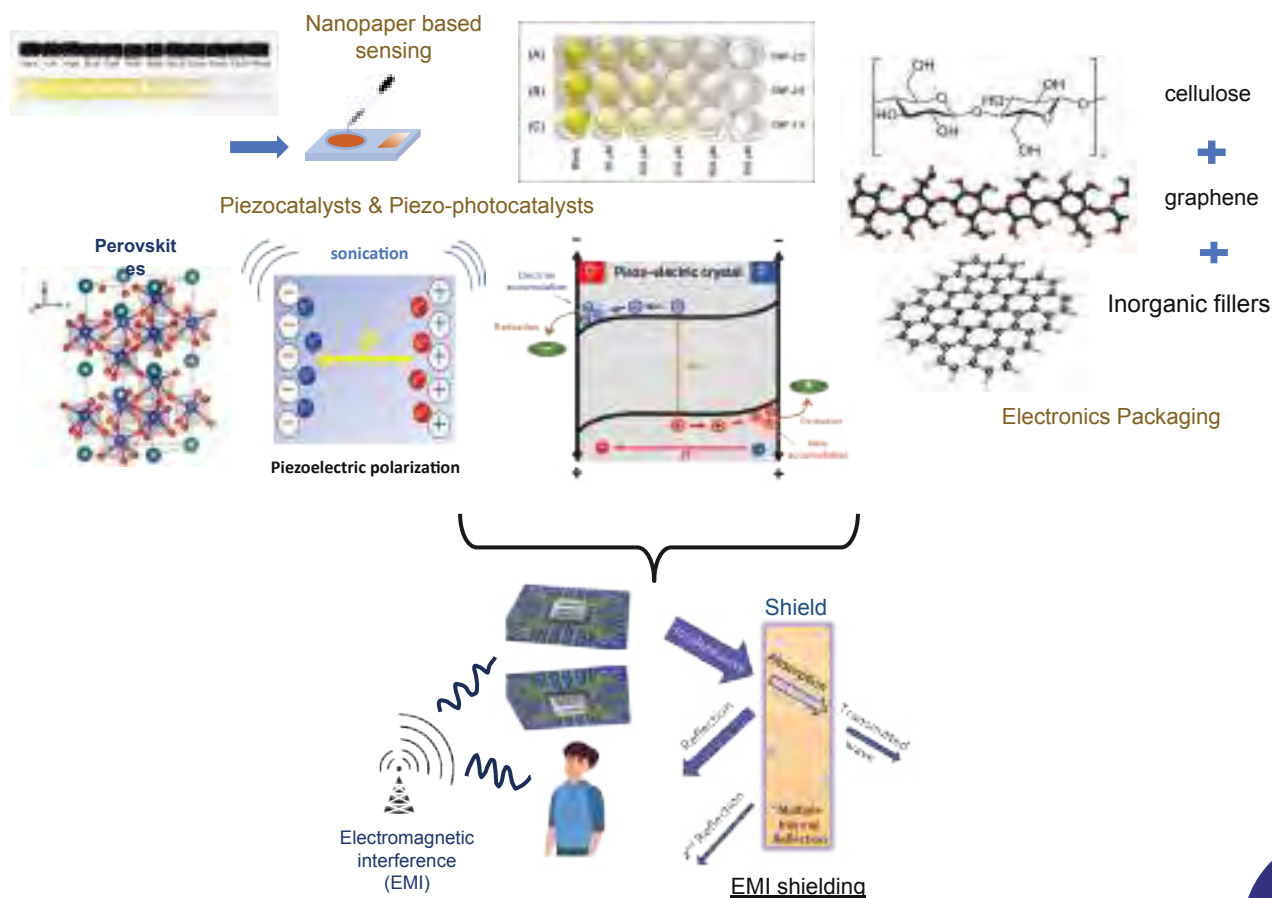
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## Research Focuses

Nanosensors, Renewable materials for Catalysts and Electronic applications.

- Development of colorimetric and luminescence nanosensors based on quantum dots: AgNPs, AuNPs and SiNPs.
- Piezocatalytic and piezo-photocatalytic materials for removal of organic pollutants: Incorporation of catalysts in recovered/reused membranes.
- Preparation of bio-based materials for electromagnetic interference (EMI) shielding: Preparation of EMI shielding films and characterizations.





# Assoc. Prof. Panitat Hasin

Department of Chemistry

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## Keywords

Sustainable Energy Materials,  
Inorganic Nanomaterials,  
Energy Conversion & Storage Devices,  
Electrochemical (Bio)Sensors



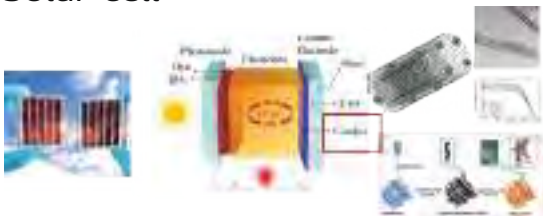
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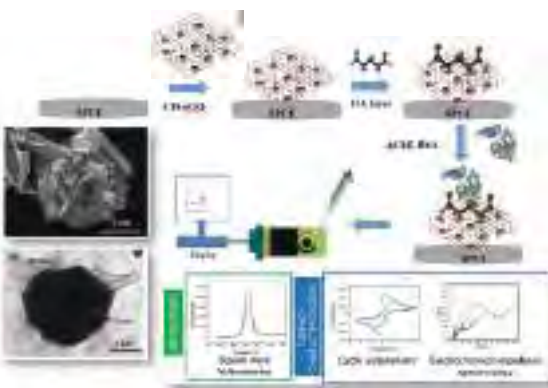
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## Solar cell



## Electrochemical Biosensor



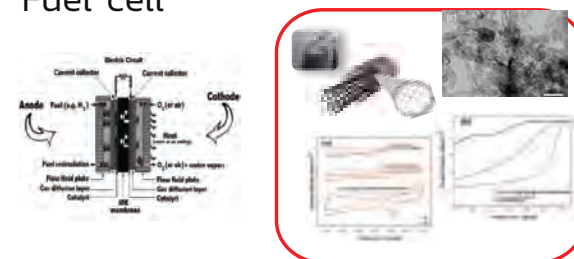
## Research Fields

- Pioneering new ways to generate green electricity from renewable energy for the future
- Synthesizing innovative solid state electro-catalysts and implementing them in electro-chemical systems to convert renewable energy into green electricity and to store excess electricity
- Developing electrochemical (bio)sensors for pesticides of interest for food control

## Supercapacitor



## Fuel cell



## Battery





# Dr. Pannaree Srinoi

Department of Chemistry

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## Keywords

Nanomaterials, Metal Nanoparticles

## Research Focuses

- Synthesis of plasmonic and magnetic nanoparticles
- Biomass-based synthesis of metal and metal oxide nanoparticles



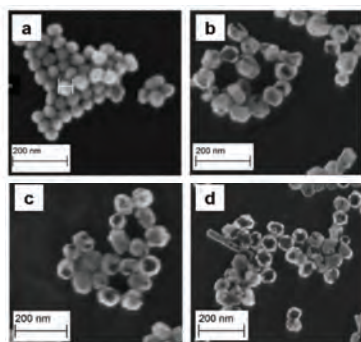
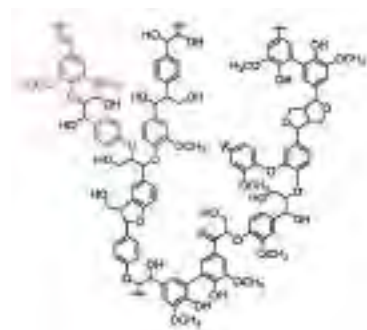
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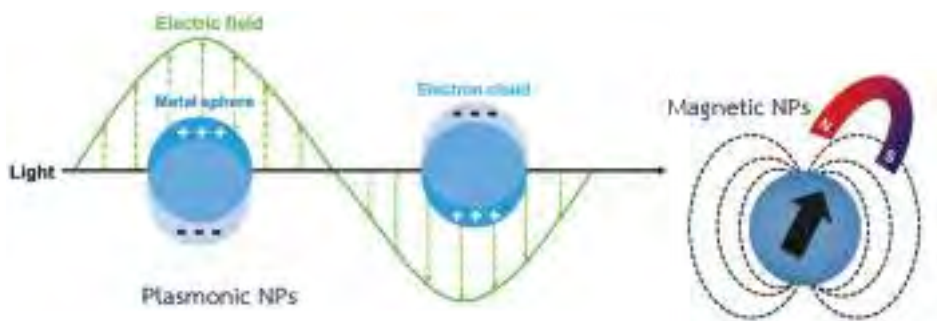
0000-0003-4400-468X



Rice straw extracted lignin



Materials 2020, 13(21), 4967





# Asst. Prof. Patraporn Luksirikul

Department of Chemistry

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## Keywords

Carbon nanomaterials,  
Heterogeneous catalyst,  
Fuel cell, Bio-sensor

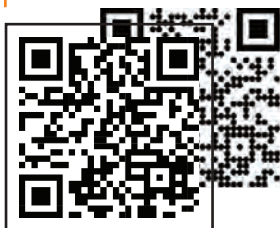
## Research field

Syntheses and design heterogeneous catalyst, carbon nanomaterials, biomass, formic acid fuel cells, chemical and bio-sensor

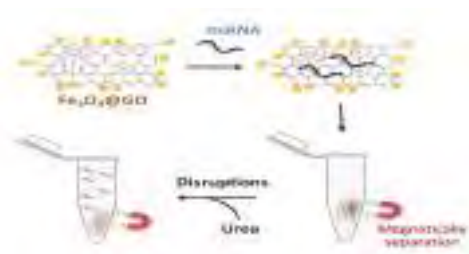
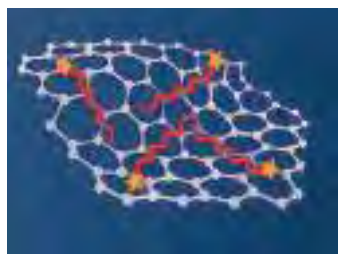
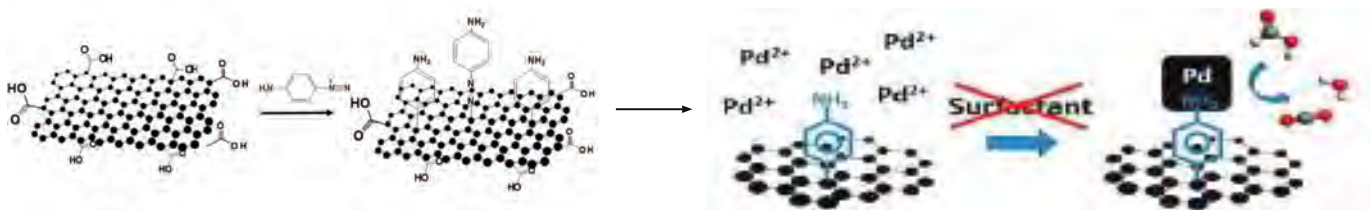
- Catalyst design of Bimetallic Pd-based Electrocatalysts for Formic Acid Oxidation.
- Synthesis of graphitic carbon nanomaterials and their derivatives prepared from biomass.
- Fabrication of nanocomposite for biosensor.



8232760800



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# Assoc. Prof. Pimpa Hormnirun

Department of Chemistry

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## Keywords

Laboratory of Catalysts,  
Advanced Polymer Materials

## Research focuses

- Heterogeneous catalysts for olefin polymerization
- Homogeneous single-site catalysts for olefin and cyclic ester polymerizations
- Synthesis of biodegradable polymers
- Chemical recycling of polymers



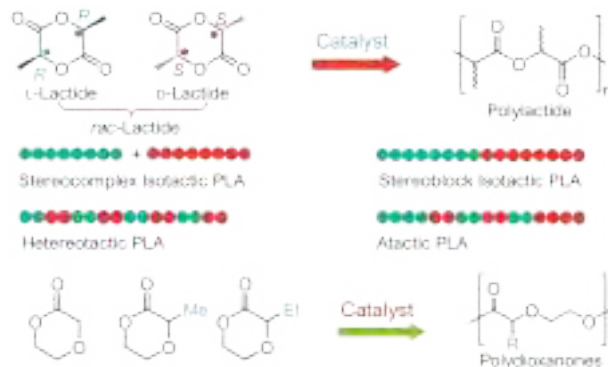
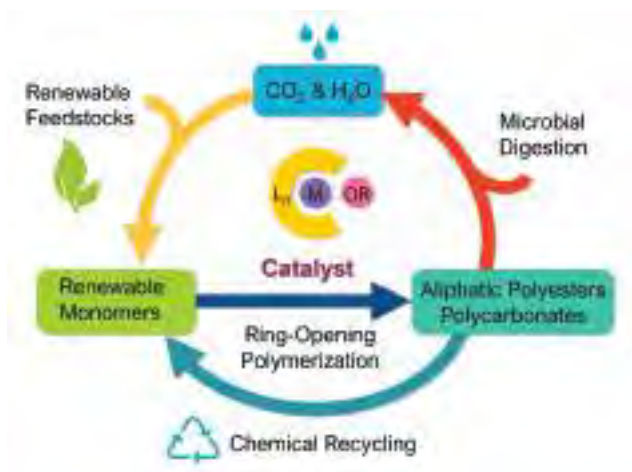
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Research Details  
QR code





# Assist. Prof. Raminda Rattanakam

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## Keywords

Biomass Conversion, Composite materials, Metal-organic frameworks, Biomaterials, Gas storage and separation, Catalysis



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0000-0002-5455-6958

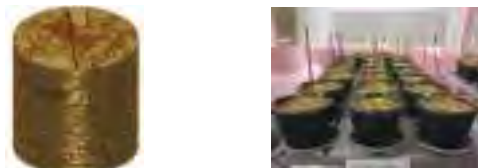


### Functional Materials from Biomass

- Biophosphate fertilizer from fish scales

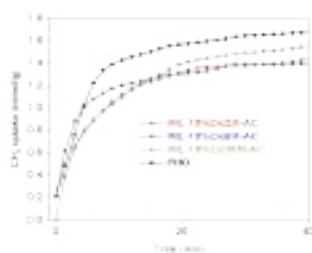
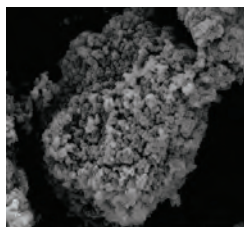


- Fertilizer-loaded biochar

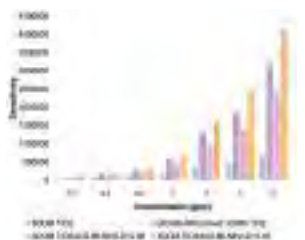


### MOF Composites

- MIL-101/Activated carbon composite

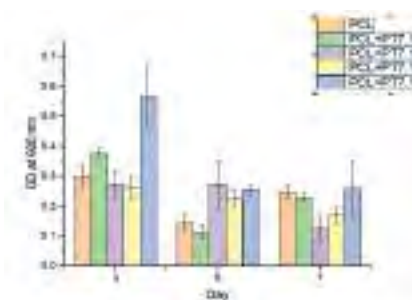
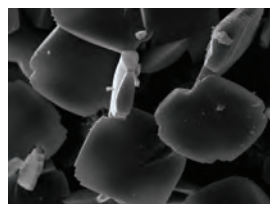


- NH<sub>2</sub>-UiO-66/TiO<sub>2</sub> composite



### Biomaterials

- MOFs for bone regeneration





# Assoc. Prof. Sutaseene Kityakarn

Department of Chemistry

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## Keywords

Materials Science, Photoelectrocatalysts, Photocatalysts, Catalysts, Sensors

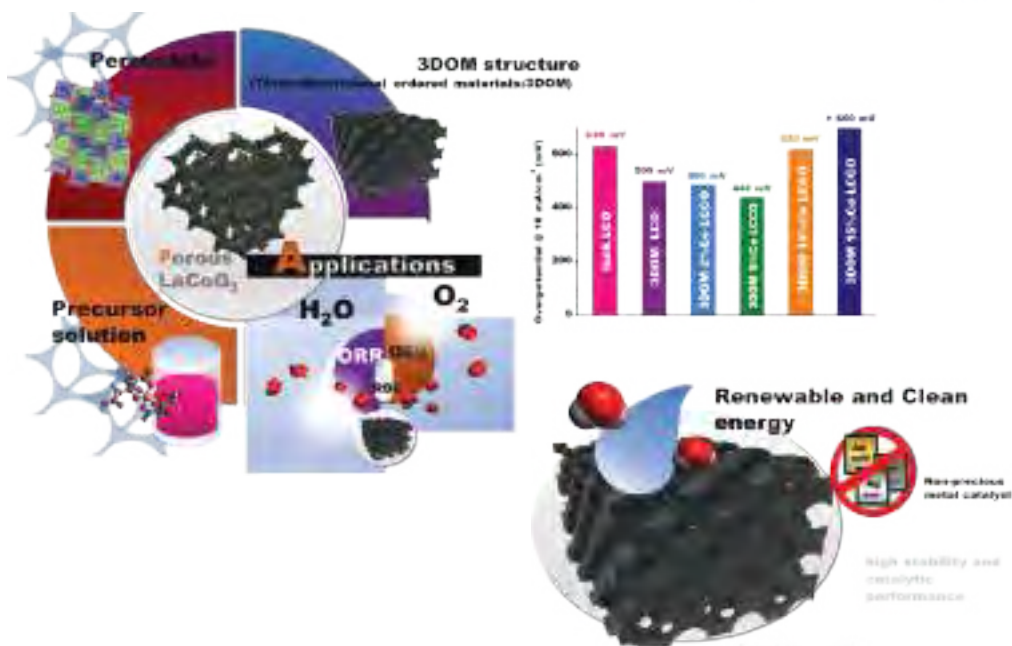
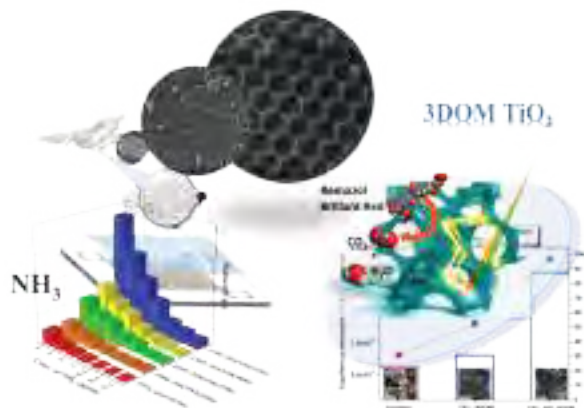
- Photocatalysts and photoelectrochemical catalysts
- Designed materials for energy storage and environment



2397780980



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# Assoc. Prof. Tanwawan Duangthongyou

Department of Chemistry

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## Keywords

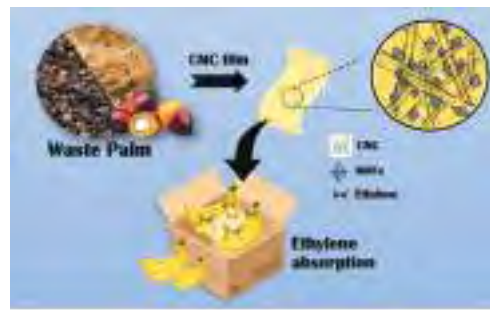
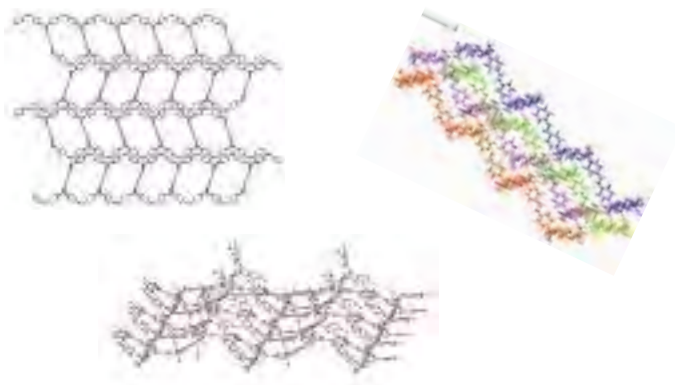
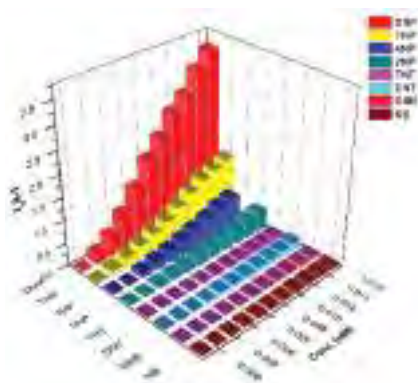
Metal organic framework,  
Coordination Polymer,  
Crystal structure determination

## Research field

- Design and Synthesis MOFs or Coordination Polymers, MOFs or CPs Application for Sensor and Agriculture
- Synthesis fluorescence MOFs for detection of metal ions, nitroaromatic compounds or nitrofuran antibiotic group
- Extract cellulose or chitin from agricultural waste and preparation MOF@CMC or chitosan film for using delay ripening of fruit



0000-0002-6965-1472







# Dr. Wannisa Sukjee

Department of Chemistry

E-mail: fsciwisu@ku.ac.th

## Keywords

Biosensor, Electrochemical sensor, Molecularly Imprinted Polymers (MIPs)

Research field:

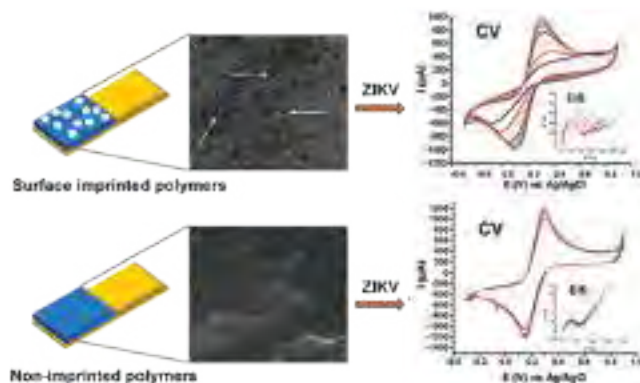
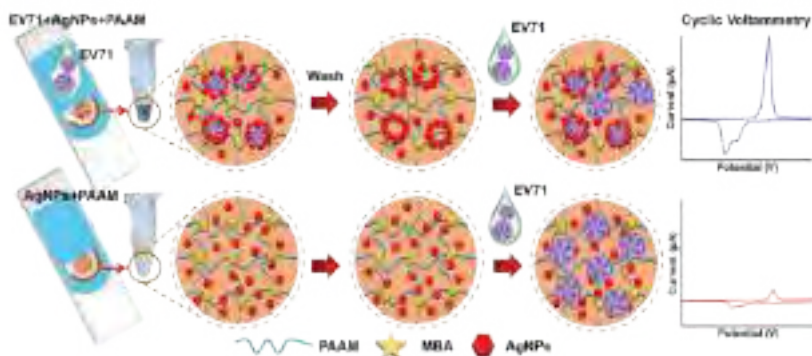
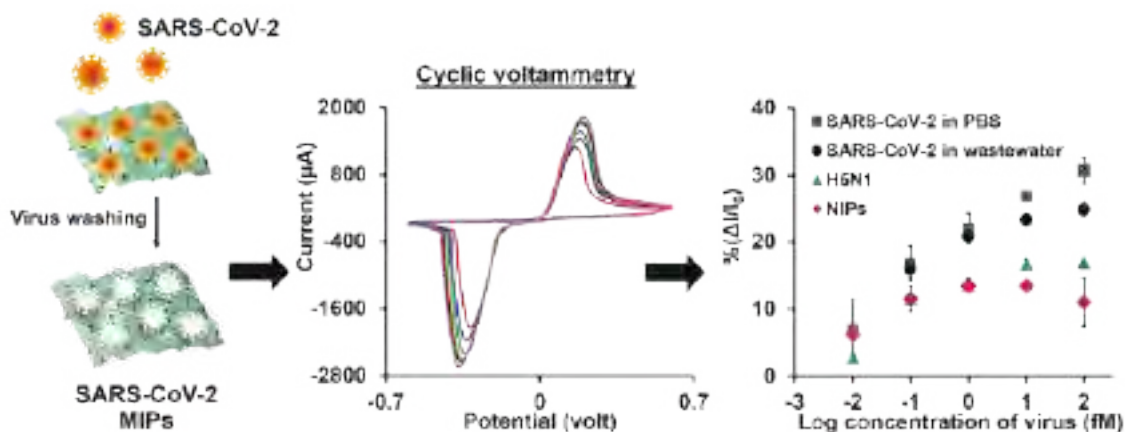
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0000-0003-1250-0451





# Asst. Prof. Wilai Siriwatcharapiboon

Department of Chemistry

E-mail: fsciwls@ku.ac.th

## Keywords

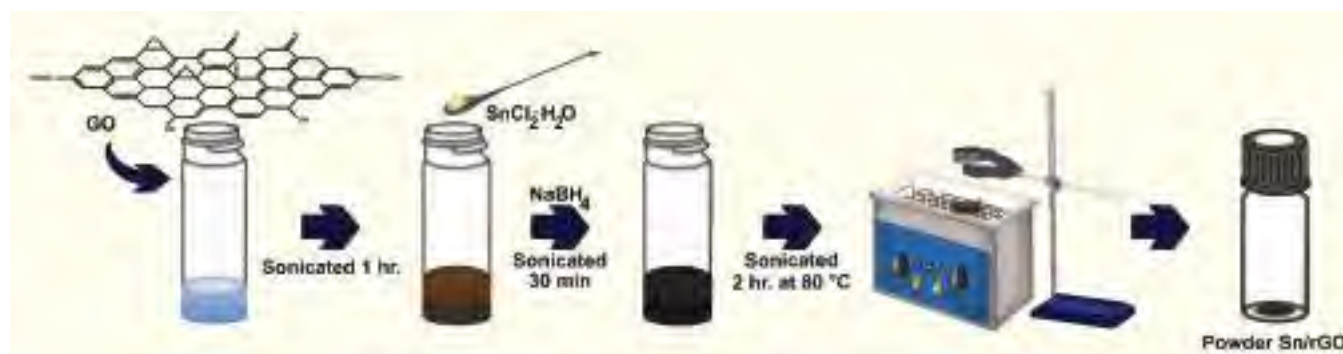
Electrochemical sensor,  
Electrocatalysis,  
Surface analysis



55217591600



0000-0003-1286-8491





# Asst. Prof. Wirunya Keawwattana

**Department of Chemistry**

E-mail: fsciwyk@ku.ac.th

## Keywords

Polymer blends, Raphene oxide, Rubber foam, Flame retardant, Grubber compounding

## Research Field

- Polymer Blends and Characterization, Rubber Compounding, Rubber Foam
- Development of Natural Rubber Based for Table Tennis Racket Top sheet and Rubber Sponge
  - Development of Rubber Foam Wall Insulation from Waste Rubber Foam



6507271758



0000-0002-2027-7782





# Asst. Prof. Wisit Hirunpinyopas

Department of Chemistry

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## Keywords

2D materials, Electrochemistry, Membranes separation, Energy storage

2D materials for electrochemical applications

1. Membrane technology for desalination and energy harvesting.
2. Electrode modification for energy storages; supercapacitors.
3. Electrocatalysts for gas production; hydrogen evolution reaction.



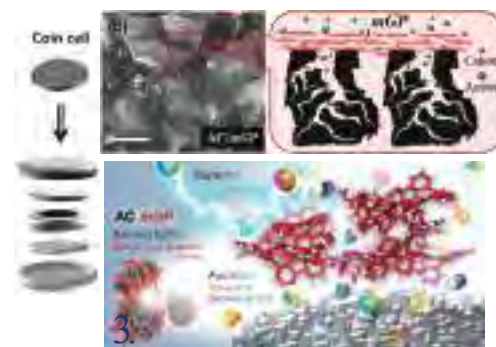
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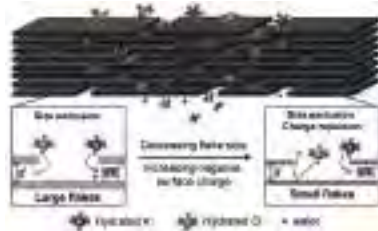


### Electrode binder



*Electrochim. Acta.* **2022**, 139696.  
*New J. Chem.* **2022**, 747-755.

### Membrane-based filtration



*Carbon* **2020**, 156, 119-129.  
*Nanoscale* **2023**, 15, 8716-8729.



2D materials-based materials

### Catalyst support



*ACS Appl. Mater. Interfaces* **2023**, 52401-52414.



# Assoc. Prof. Chanapa Kongmark

**Department of Materials**

E-mail: chanapa.k@ku.th

## Keywords

In-situ XRD/XAS, Synchrotron techniques, Catalysts, Supercapacitors

## Research interests

1. Structural Studies of Advanced Materials using Synchrotron Light
  - Catalysts
  - Magnetic materials
  - Electrochemical materials
2. Fundamental relationship between structure and properties of materials



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0000-0001-8533-3223



Our research focuses on the development of advanced materials for energy and environment applications.

- Electrode materials for supercapacitors
- Catalysts
  - Phodegradation of organic compounds
  - Upgrading of vegetable oil to biofuel
  - Valorization of greenhouse gases into value-added products

**Nanoparticle Synthesis**

Spinel MnFe Oxides

Fe Catalysts

SBA Support

CuFe<sub>2</sub>O<sub>4</sub>/SBA

**In-Situ Structural Studies**

Copper nitrate

Copper oxide

Copper hydroxide

Copper hydroxide

Hydroxide

**Applications**

**Deoxygenation of Fatty Acids**

Catalyst

Green diesel

**Photocatalysis**

**Energy Storage Devices**



# Asst. Prof. Chantiga Choochottiros

Department of Materials

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## Keywords

biobased polymers, biodegradable polymers, chitosan, PLA, PCL, hydrogel, scaffold

## Research field

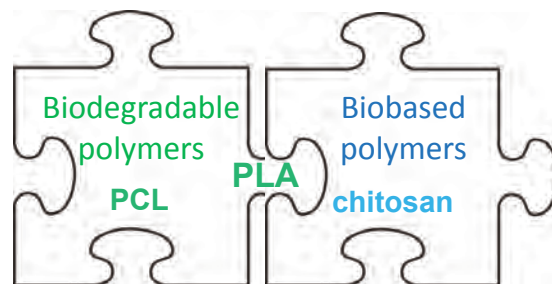
Synthesis and modification polymers, Functional polymers, Polymer networks, Star-shaped polymers, Hydrogel, Scaffold, Nanoparticles



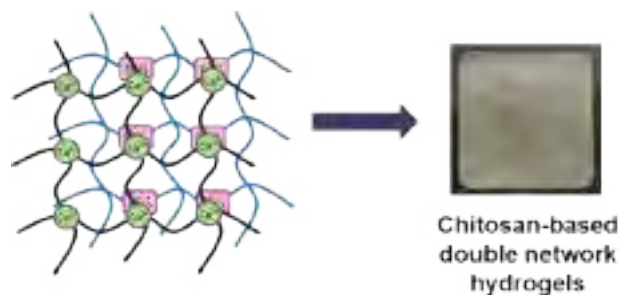
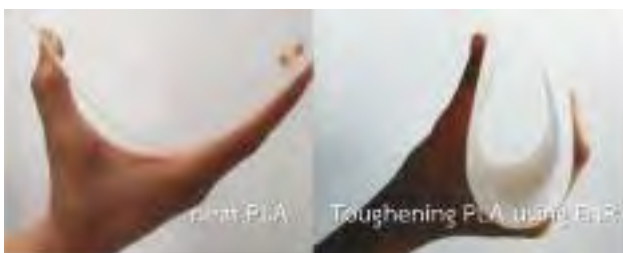
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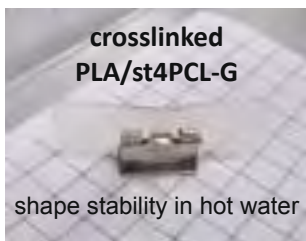
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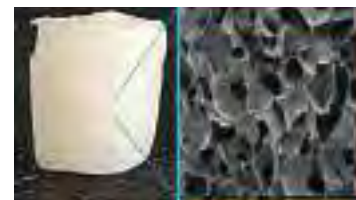
## Toughening PLA



## Toughening-thermal dual stabilizer



Chitosan-based nanoparticles



Chitosan/stPCL network via urethane/urea linkage



# Assoc. Prof. Decha Dechtrirat

Department of Materials Science

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## Keywords

Sustainable materials, Bio-based materials, Biomimetic materials, Biosensors



36015206500



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## Research Areas:

- Nanomaterials in sensors and medical diagnosis (i.e. point-of-care testing/POCT, test kits, test sticks)
- Fibrous and Porous materials for industrial applications
- Sustainable materials for environmental applications
- SBio-based materials for medical applications



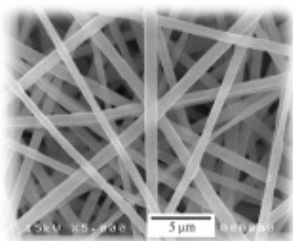
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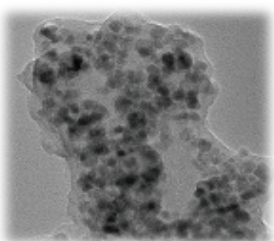
"Test kits"



"Test sticks"



"Nanofiber"



"MNP/carbon composite"



"Magnetic carbon"



"Wound dressing"



"Plant extracts"



"Tissue scaffold"



# Dr. Hassarutai Yangthong

Department of Materials

E-mail: fscihty@ku.ac.th

## Keywords

Natural rubber, Polymer composites, Filler, Compound, Waste

## Research interests

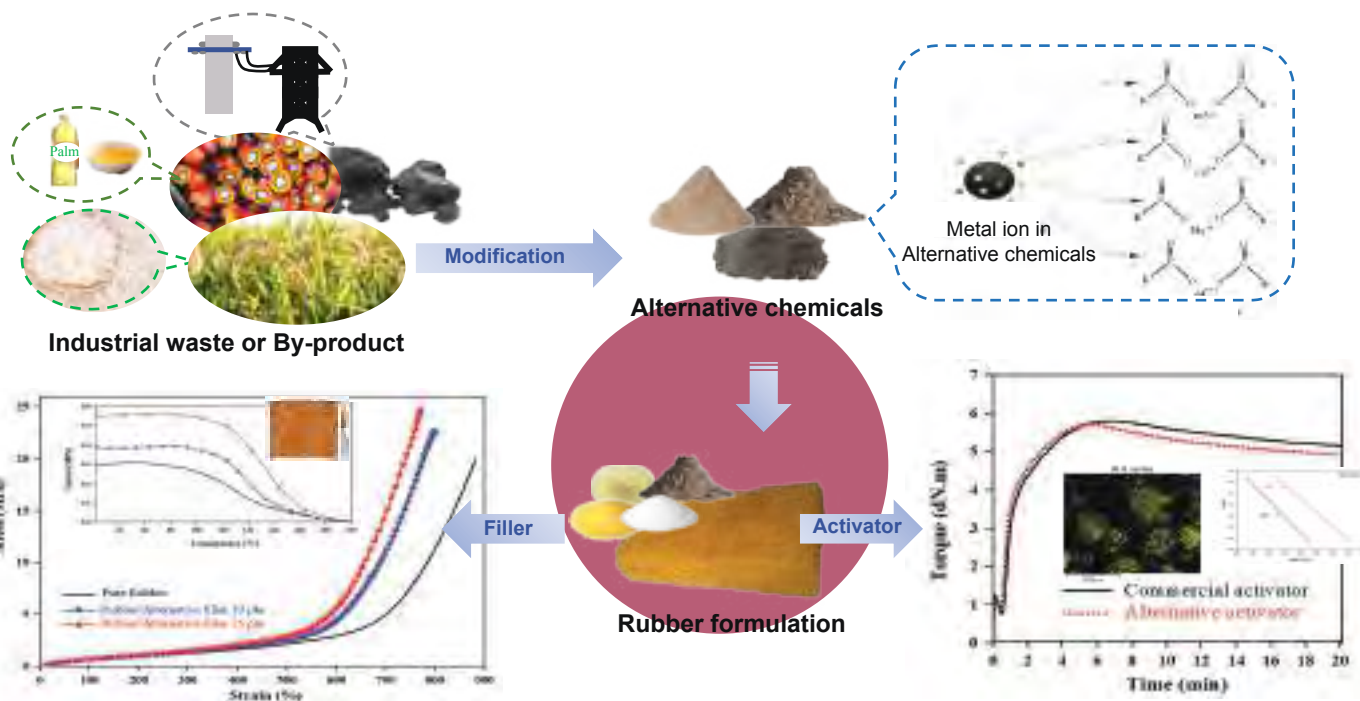
- Development of formulations for polymer applications
  - Natural rubber products
  - Polymer composites
- 2. Utilization of industrial waste to reduce commercial chemicals
  - Alternative filler
  - Alternative activator



57200327635



0000-0002-8217-6493







# Asst. Prof. Nattasamon Petchsang

Department of Materials

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## Keywords

Semiconductors, Metals, Nanowires,  
Nanosheets, Quantum Dots



0000-0003-4355-5201

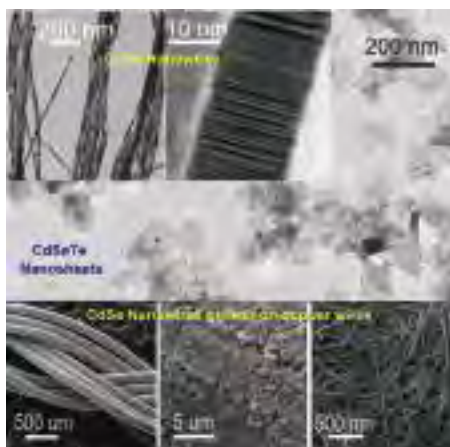
## : Heterostructures

IV-VI semiconductors:  
PbSe, PbS, MoSe<sub>2</sub>, MoS<sub>2</sub>

II-VI semiconductors  
ZnSe, ZnTe, CdSe, CdTe

Metals: Ag nanowires and Ag nanoparticles

Applications: Strain sensors, Gas sensors, Photodetector



Low-dimensional semiconductor laboratory  
Our products: Nanowires, Nanosheets, Quantum Dots



# Dr. Nattawut Yuntawattana

**Department of Materials**

E-mail: fscinwy@ku.ac.th

## Keywords

Biodegradable polymer,  
Sustainable polymer,  
Polymer recycling,  
Advanced materials



57208011941



0000-0002-3839-6149



## Research Focuses

### Polymer Synthesis

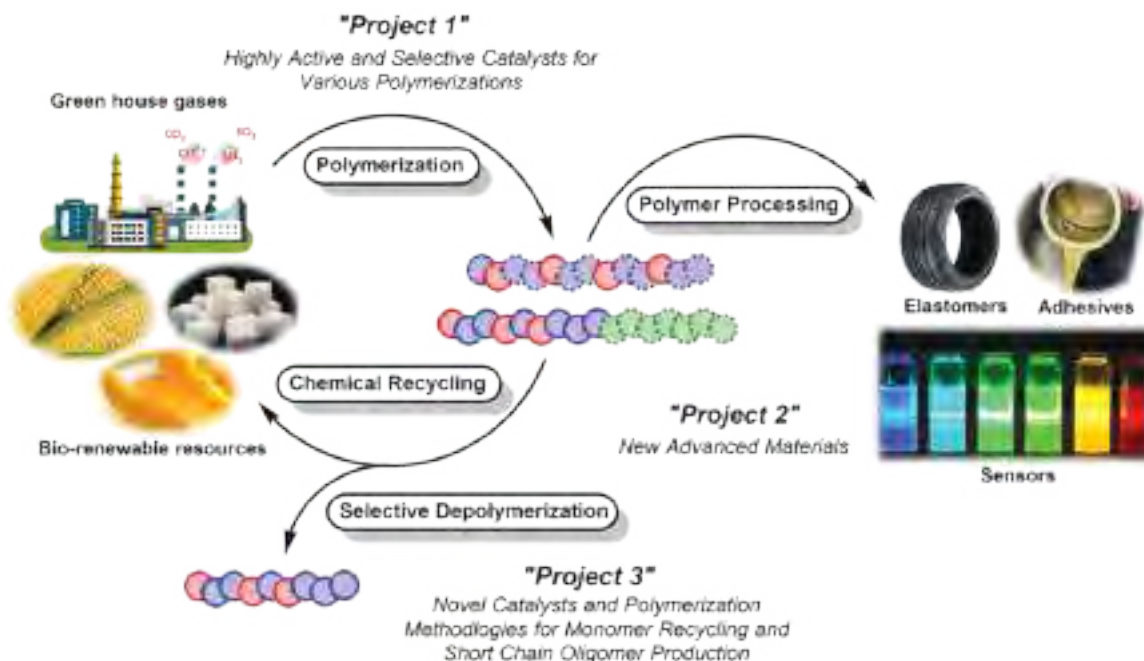
- ❖ Highly active and selective homogeneous catalysts for various polymerizations
- ❖ Polymers from bio-renewable monomers and wastes
- ❖ Novel polymerization strategies for precise polymerization

### Polymer Applications

- ❖ Advanced polymeric materials
- ❖ Smart and active food packaging

### Polymer Recycling

- ❖ Chemical recycling and upcycling of various plastic waste
- ❖ Selective depolymerization to produce oligomers





# Assoc. Prof. Pongthep Prajongtat

**Department of Materials Science**

E-mail: fscipop@ku.ac.th

## Keywords

Perovskite solar cells, Nanomaterials, Semiconductors, Thin films, Solar energy conversion, DFT

## Research Interests

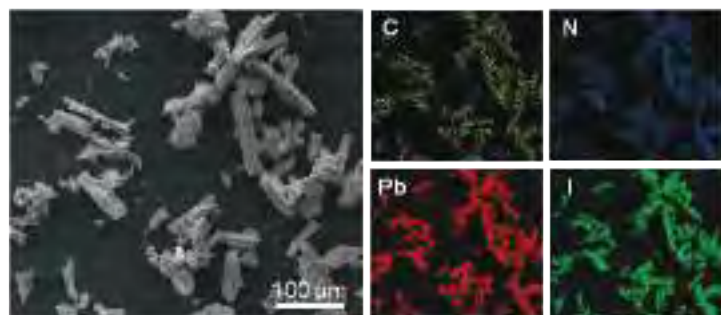
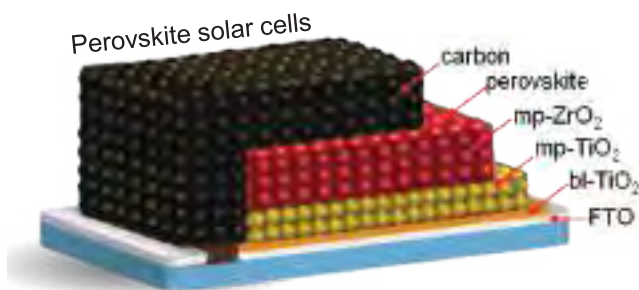
- Fabrication and characterization of low-cost and highly efficient perovskite solar cells
- Chemical synthesis and modification of nanomaterials and thin films
- Density functional theory (DFT) simulations of semiconductors and solar cell materials



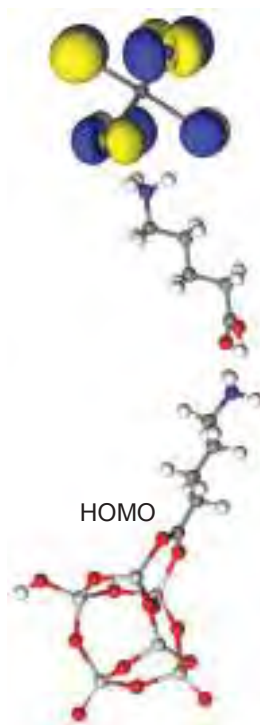
55635079700



0000-0001-9618-2504



Chemical synthesis and modification of nanomaterials





# Dr. Supitta Suethao

Department of Materials

E-mail: fscistsu@ku.ac.th

## Keywords

Natural rubber, Rubber foam, Rubber technology, Composite materials, Polyme, Self-healing materials

## Research interests

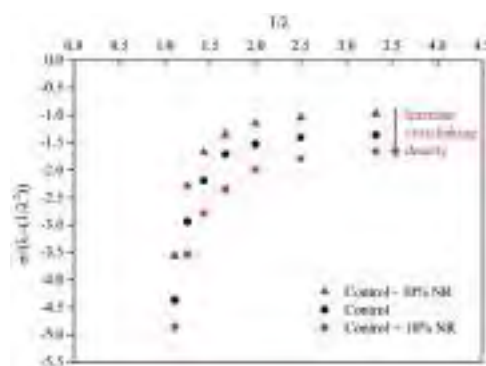
- Natural rubber
- Rubber foam
- Self-healing materials



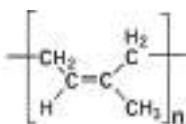
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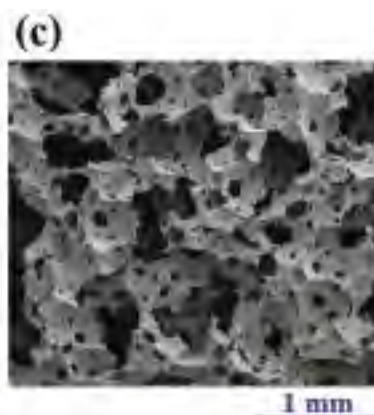
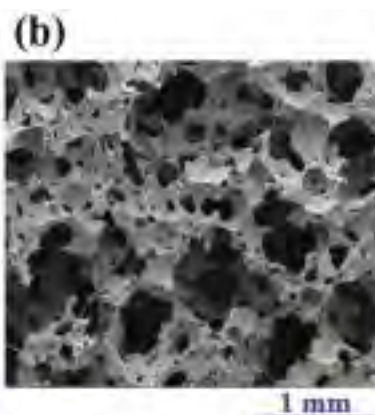
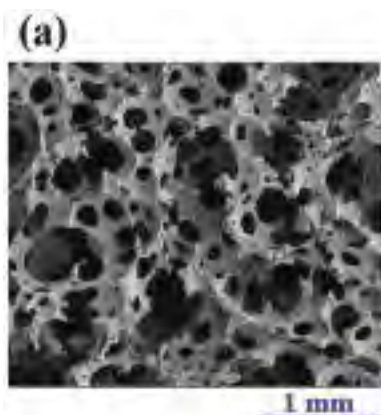
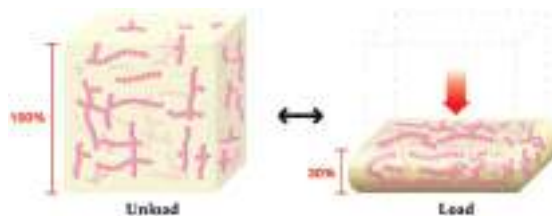
0009-0006-8714-9722



Natural rubber latex



Light truck tire





# Assoc. Prof. Thidarat Supasai

**Department of Materials Science**

E-mail: fscitrs@ku.ac.th

## Keywords

Renewable Energy, Solar Cells, Thin Films, Surface/Interface Modification, Defect Analysis

- Fabrication and characterization of low-cost and highly efficient perovskite solar cells
- Chemical synthesis and modification of nanomaterials and thin films
- Density functional theory (DFT) simulations of semi-conductors and solar cell materials



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0000-0001-9876-3687



### High-quality thin-film fabrication

**Sequential thermal evaporation**

**Flexible solar cell**

**Film morphology**

For more info, please visit our website

- Scalability
- Low material waste
- Layer-by-Layer control
- High purity and quality of films
- High resolution and uniformity

### Material and device characterizations

**Surface/interface characterizations**

**Device efficiency and durability**



# Assoc. Prof. Wanvimol Pasanphan

**Department of Materials Science**

E-mail: wanvimol.p@ku.th

## Keywords

Functional polymers, Bio-based materials, Electron beam processing, Nanotechnology, Coatings/Printing materials



23390673000



0000-0003-1221-4455



## Research Focus

- Electron beam processing and green chemistry
- Biochemicals, bio-based materials, and bioplastics
- Nanostructured polymers, nanohybrid, nanocomposite
- Molecular/process design for industrial applications
- High energetic radiation for advanced nanomaterials



## Selected publications (Tier 1, Q1)

- Journal of Food Engineering, 2024, 364, 111794.
- Progress in Organic Coatings, 2024, 186, 108091.
- European Polymer Journal, 2024, 203, 112670.
- ACS Sustainable Chemistry and Engineering, 2022, 10, 51, 17027.
- ACS Sustainable Chemistry and Engineering, 2023, 10 (8), 2653.
- Progress in Organic Coatings 2022, 163, 106658.
- Carbohydrate Polymers, 2021, 257, 117610
- International Journal of Nanomedicine, 2021, 16, 6857
- Polymer Degradation and Stability, 2021, 163, 109619.

## Materials for healthcare and cosmeceuticals

Active compound nano-encapsulation  
 Nanocarrier, drug targeting, controlled-release  
 Nano therapeutic & therapeutic agents  
 Functional hydrogels/nanogels

## Functional and engineering materials

- Bio-coating & Bio-inks
- EB/UV curable coating & ink
- Functional & printable coatings
  - Antioxidant
  - Antimicrobial
  - Antivirus
  - Water repellent
  - Conductive

Superhydrophobic & waterproof coatings

## Materials for food and agriculture

Active film for extending shelf life of food and fruits

FUNCTIONAL BIOPLASTICS

Nano-fertilizer & water saving material for plant treatment and soil amendment



# Assoc. Prof. Wirasak Smitthipong

**Department of Materials**

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## Keywords

Natural rubber, Rubber technology, Biopolymers, Composite materials, Polymer, Nanotechnology, Physical chemistry, Supramolecular materials

## Research focuses

- Nanomaterials for natural rubber applications
- Bionanotechnology
- Supramolecular materials



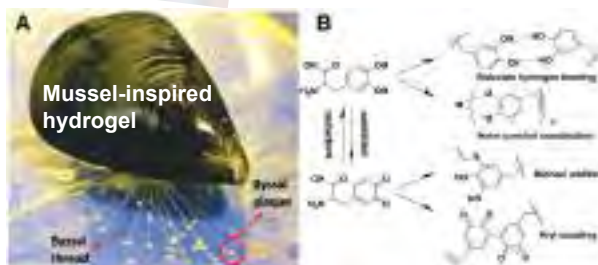
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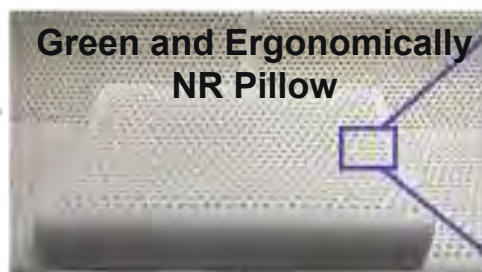
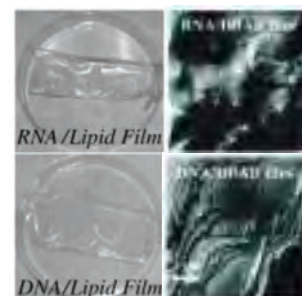
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**Rubber product (pillow, mattress adhesive, tires)**



Durability, Saved-energy, Comfortability etc





# Assoc. Prof. Adisak Boonchun

**Department of Physics**

E-mail: fscissc@ku.ac.th

## Keywords

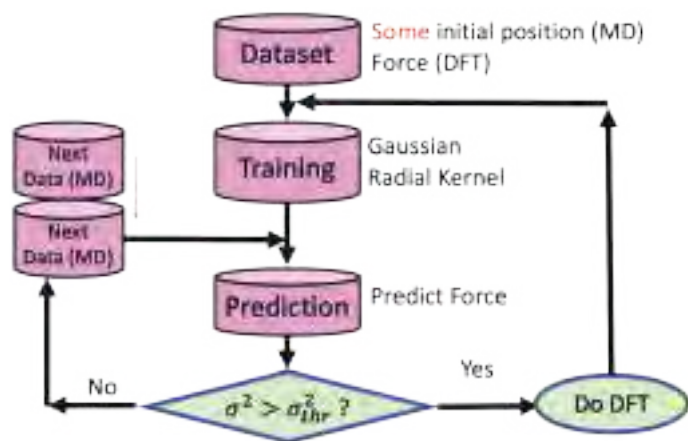
DFT-based machine learning,  
Materials Informatics

Artificial Intelligence and Modeling for Materials Science (AIMS)

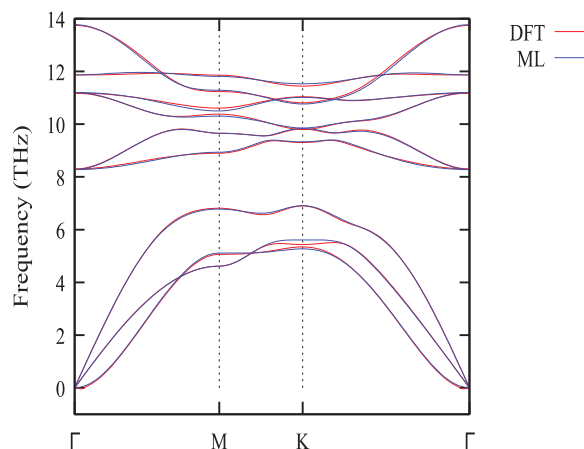
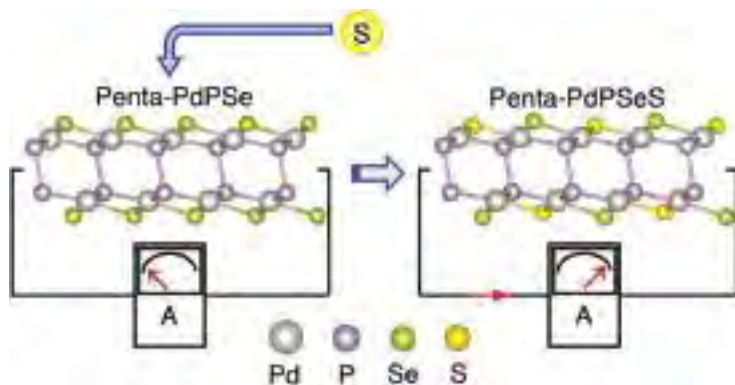
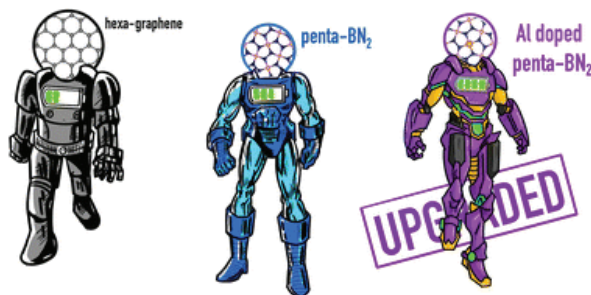
- DFT-based machine learning force field for Materials Informatics
- Computational Simulation of 2D materials as Li-ion battery materials
- Tailoring materials properties by using DFT and ML



0000-0001-6527-4537



J of Materials Chemistry C (2023) 11(17), 5825







# Asst. Prof. Apichart Pattanaporkratana

Department of Physics

E-mail: fsciACP@ku.ac.th



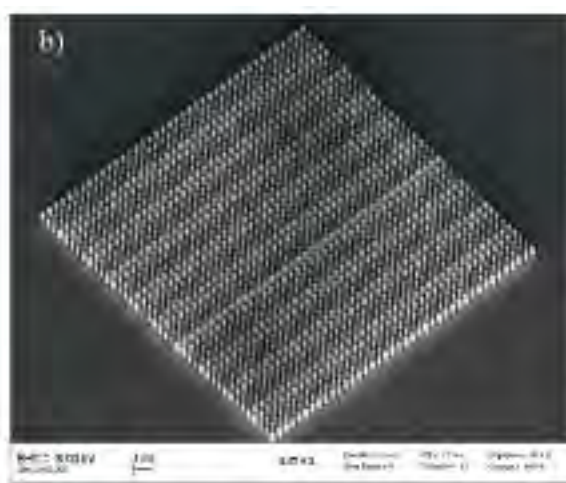
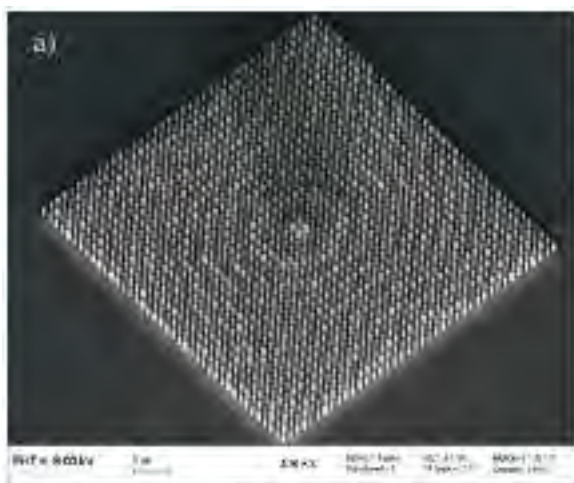
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0009-0008-8515-9286

### Research areas

- Optical Tweezers
- Liquid Crystals
- Laser Spectroscopy Techniques.



Design and Investigation of a metalens for efficiency enhancement of laser-waveguide coupling in a limited space system  
H. Laeim, et al. (2022) <https://doi.org/10.1117/12.2629789>

### Thailand Liquid Crystals in Space (Co-Investigator)



<https://thestandard.co/thailand-liquid-crystals-in-space/>



# Assoc. Prof. Bumned Soodchomshom

**Department of Physics**

E-mail: bumned@hotmail.com

## Keywords

Quantum condensed matters,  
Topological materials, 2D materials,  
Superconductivity

## Research field

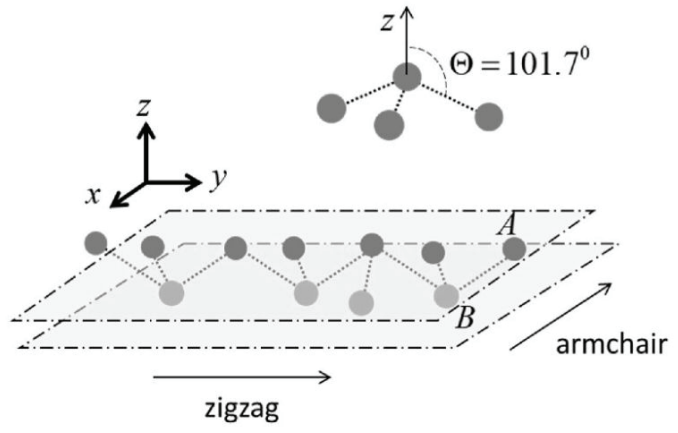
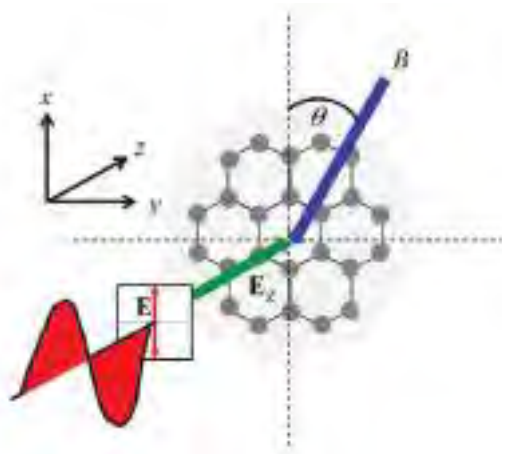
We have conducted advanced studies in quantum physics, specifically within the realm of condensed matter systems. Our research primarily focuses on topological materials and low-dimensional systems. The practical applications of our work extend to quantum technologies such as quantum-based sensing qubits, and spin-valleytronics. Additionally, we are dedicated to developing new fundamental theories to enhance the understanding of the nature of quantum physics.



16234864200



0009-0005-2950-336X



$$H = -t \sum_{\langle i,j \rangle \alpha} c_{i\alpha}^\dagger c_{j\alpha} + i \frac{\Delta_{SO}}{3\sqrt{3}} \sum_{\langle\langle i,j \rangle\rangle \alpha \beta} \lambda_{ij} c_{i\alpha}^\dagger \sigma_{\alpha\beta}^z c_{j\beta} + \sum_{\langle\langle i,j \rangle\rangle \alpha} t_{ij} c_{i\alpha}^\dagger c_{j\alpha} + \Delta_z \sum_{i\alpha} \xi_i c_{i\alpha}^\dagger c_{i\alpha}$$

Adopted from Micro and Nanostructures (2024)



# Assoc. Prof. Chatchawal Wongchoosuk

**Department of Physics**

E-mail: chatchawal.w@ku.ac.th

## Keywords

Gas Sensor, Chemical Sensor, DFTB, Quantum Dot, Flexible and Stretchable Sensor



24170275700



0000-0002-5613-6615

Google Scholar



## Research Focuses

- Quantum/molecular dynamic calculations for the design of sensing materials based on self-consistent-charge density-functional tight-binding method (SCC-DFTB).
- Synthesis of sensing materials, i.e. Quantum dots, Semiconductor/Metal nanoparticles, Functionalized CNTs, Graphene, 2D materials, Transition metal dichalcogenides, MXene, Hybrid Heterostructures etc.
- Fabrication of electronics devices, i.e. Gas sensors, Electrochemical sensors, Electroluminescence sensors, Flexible and stretchable sensors, Pressure sensors etc.
- Development of smart system with AI, i.e. E-nose, E-Tongue, E-Skin





# Asst. Prof. Jarin Osaklung

**Department of Physics**

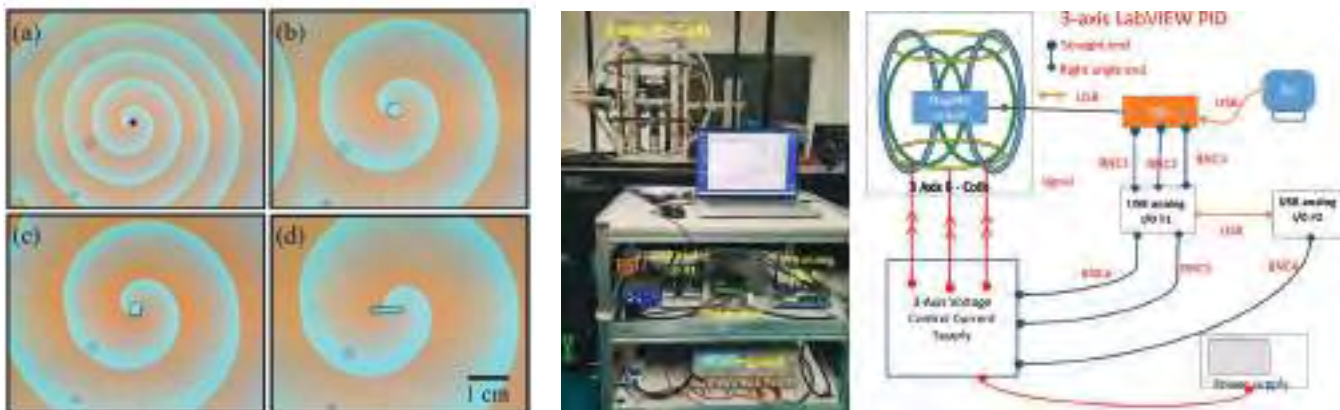
E-mail: chonrawut@gmail.com

## Keywords

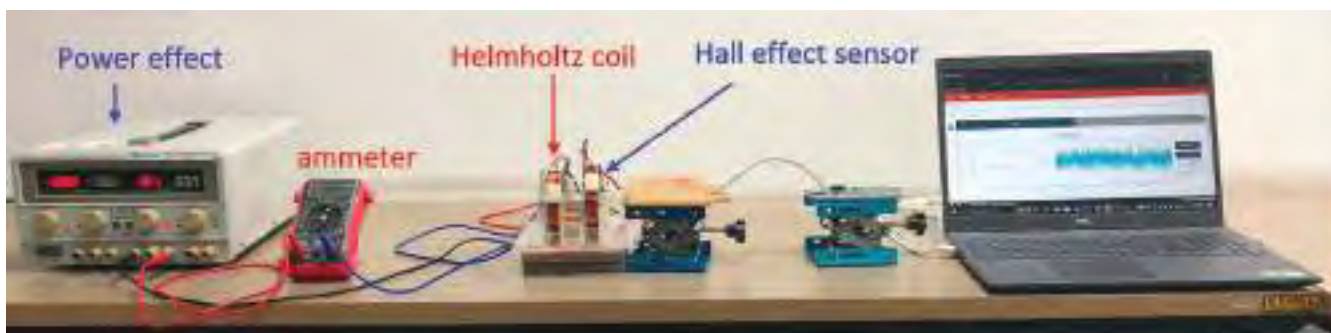
Nuclear Quadrupole Resonance, Atomic Magnetometry, Spiral wave, excitable media, electromagnetic shielding enclosure at low frequencies

## Research field

- Nuclear Quadrupole Resonance with Atomic Magnetometry
- Investigation of the dynamics of pinned spiral waves in BZ media.



Spiral waves in the BZ reaction: (a) A free spiral wave (no obstacle) with a spiral core of 1.0 mm diameter (black circle), and spiral waves pinned to (b) a circle with diameter 2.8 mm and to rectangles with dimensions (c) 2.3 mm × 2.6 mm and (d) 6.5 mm × 0.9 mm.



NQR set up and home-made Helmholtz coil magnetic field measurement



# Assoc. Prof. Jiraroj T-Thienprasert

Department of Physics

E-mail: chonrawut@gmail.com

## Keywords

Density functional theory,  
Semiconductor, Defects

## Research Focuses

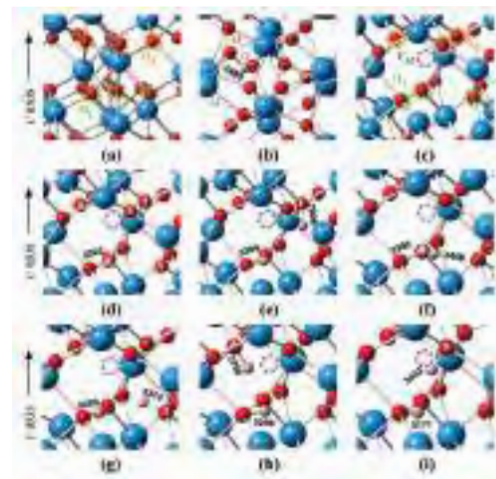
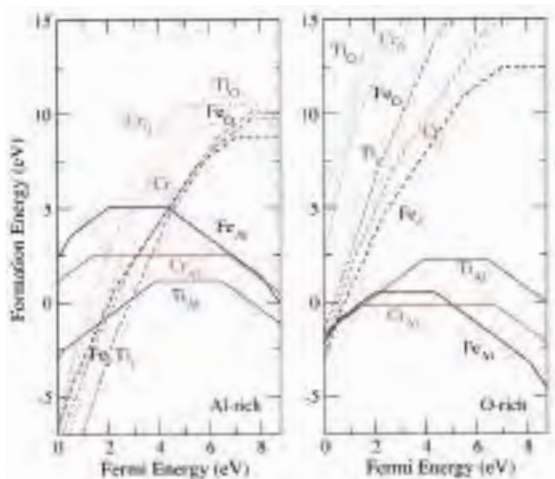
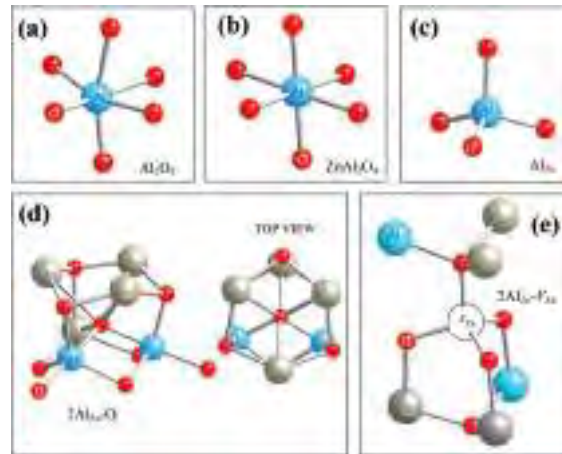
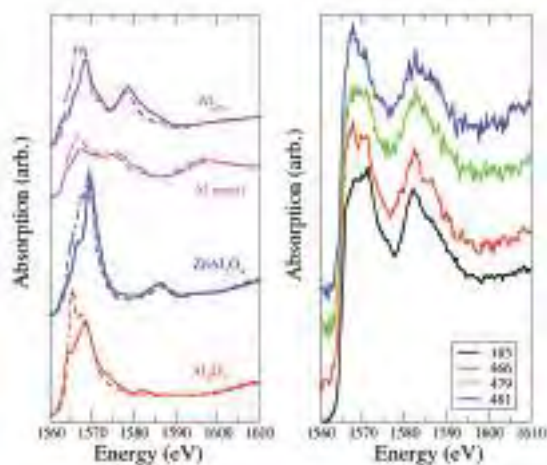
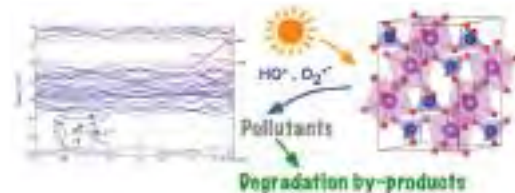
- Investigation of defects in materials by first-principles calculations
- Identification of defect structure in materials



26538194200



0000-0001-5611-9607





# Assoc. Prof. Jirasak Wong-ekkabut

Department of Physics

E-mail: jirasak.w@ku.th

## Keywords

Computational & Experimental Biophysics, Soft-condensed matter physics, Theoretical, Lipid bilayers, Molecular Dynamics simulations, Lipid peroxidation, protein penetration, Fullerenes

## Research Focuses

The computational modelling of biological and material systems for agricultural applications. The laboratory is very interdisciplinary, having specialties in biology, physics, chemistry and material science. The projects intensively study the nanoencapsulation of natural products, rubber nanocomposites, transportation of small biomolecules pass through cell membrane, DNA-protein interactions, drug-protein interactions, protein homology modelling and genome sequencing etc. It is anticipated that the understanding at atomic level will lead to the development of new technology and innovation for agriculture in the future.



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0000-0002-3651-9870



## Molecular dynamics(MD) simulations

**Drug design & Drug delivery system**

Study of Thai Herb to Antiviral Agents Against COVID-19

**The interactions of small molecules with biological membrane**

Single lipid membrane      Plasma membrane

- The permeation process of small molecules across a lipid bilayer
- The detailed motions of the small penetrants within the membrane interior

**Cell Delivery and Cell Killing Applications**

**Natural Rubber-Fullerene Composite**

Development of advanced rubber technology for novel, cost-effective, material with very high stiffness and thermal endurance with optimizing conditions of filler contents.

**Liquid crystal**

Investigation of Liquid Crystal Orientation in Different Solvents



# Assoc. Prof. Nattaporn Chattham

**Department of Physics**

E-mail: nattaporn.c@ku.ac.th

## Keywords

Liquid Crystals, Optics, Metamaterials, Space experiment, System Engineering

## Research Focuses

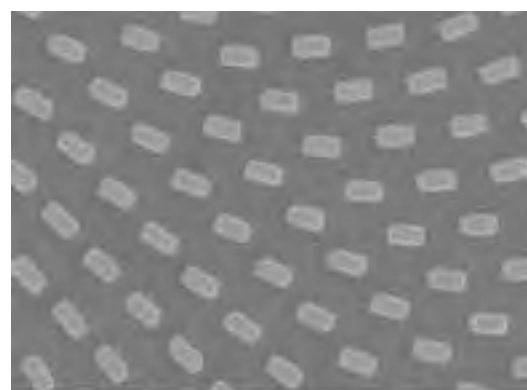
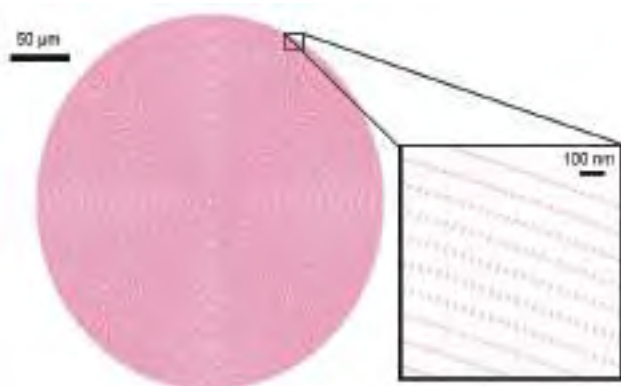
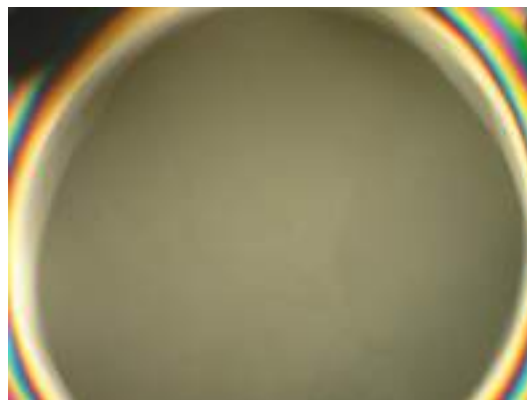
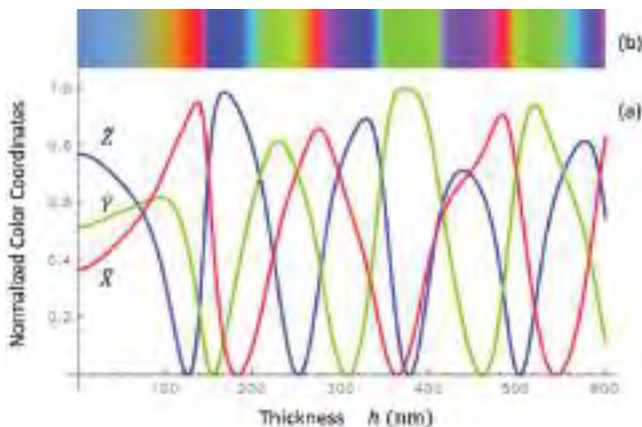
- Liquid crystals in space for the development of LCD for future space applications
- System Engineering for scientific payload construction
- Metamaterials and Metalens for miniaturizing and simplifying optical systems



15831128600



0009-0005-8296-8107





# Assoc. Prof. Pakpoom Reunchan

Department of Physics

E-mail: Pakpoom.r@ku.th

## Keywords

Defects and Doping, Semiconductors, Density-functional calculations, Hydrogen storage

## Research Focuses

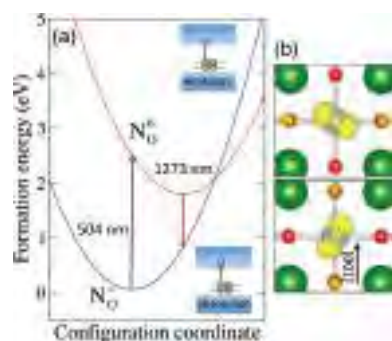
- Point defect engineering in semiconductors and functional materials: p-type/n-type controlling
- Hydrogen behaviors in optoelectronic and energy storage materials
- Surface engineering for energy storage and gas sensors
- Nanomaterials for gas sensor and hydrogen storage



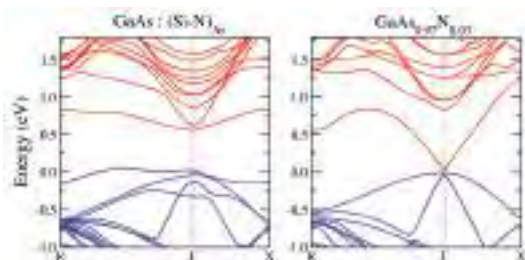
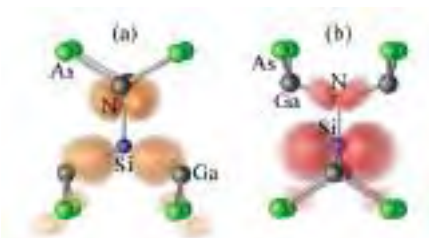
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Volume 25  
Number 4  
28 January 2023  
Pages 2645-3552



PCCP

Physical Chemistry Chemical Physics  
rsc.li/pccp

2023 hot articles







# Assoc. Prof. Papichaya Chaisakul

Department of Physics

E-mail: fscipac@ku.ac.th



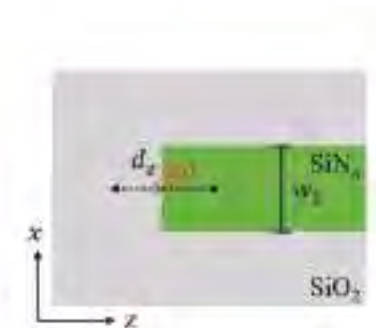
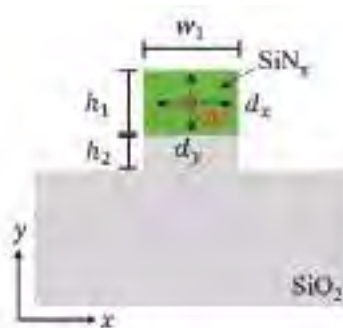
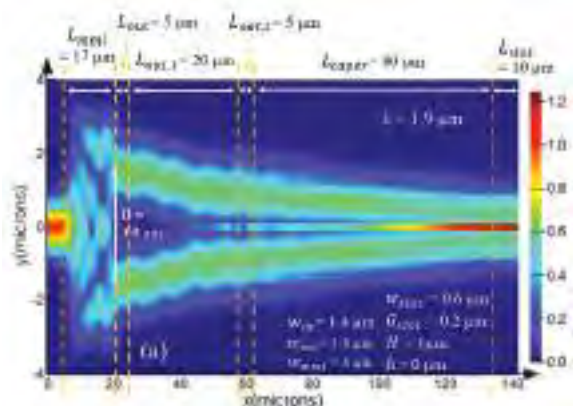
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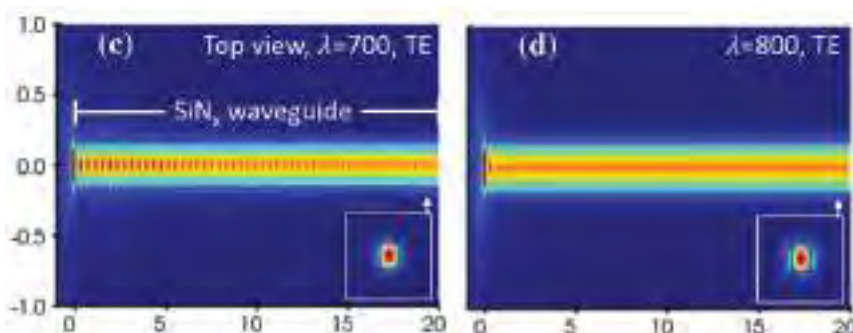
## Design and Simulation:

Si<sub>3</sub>N<sub>4</sub> Photonics Circuits for Wideband On-Chip Optical Gas Sensing



N. Koumpai, et al. (2021)  
<https://doi.org/10.3390/s21072513>

## Single photon emission to SiN<sub>x</sub> optical waveguides



P. Jaturaphagorn et al. (2023)  
<https://doi.org/10.1007/s00340-023-08019-6>



# Asst. Prof. Pongsakorn Jantaratana

Department of Physics

E-mail: fscipsj@ku.ac.th

## Keywords

Magnetic materials, Sensors and actuators, Measurement and instrumentation

## Research Field

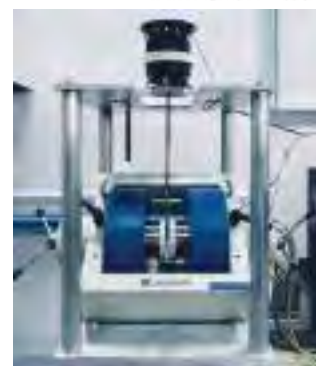
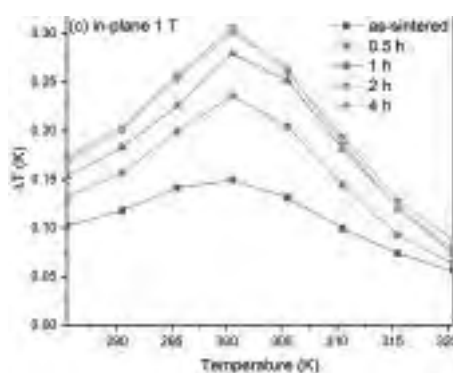
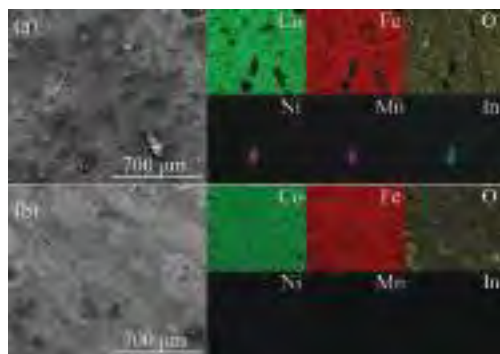
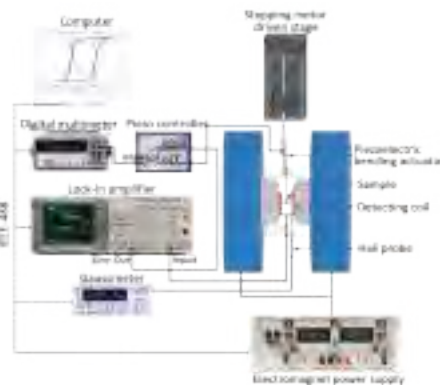
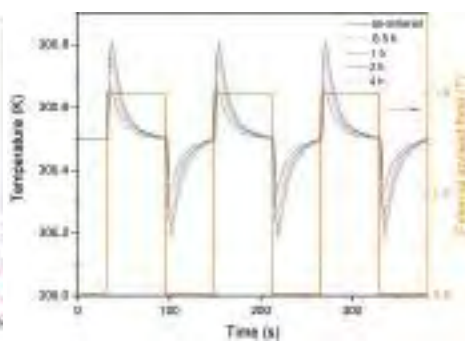
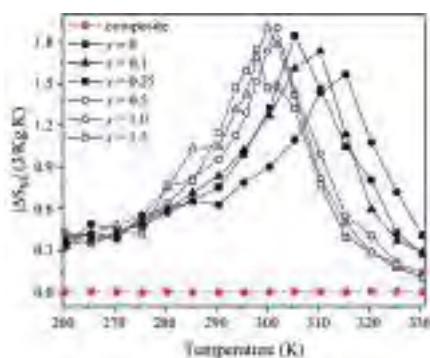
- Development of magnetic materials that exhibit magnetocaloric effect near room temperature for use in magnetic refrigeration and magnetic cooling system
- Investigation of the effect of magnetic fields treatment on seed germination and growth of plants



7801590036



0000-0002-4050-3628



Near room-temperature magnetocaloric effect of liquid phase sintered NiMnInCr alloys

In-house developed instrument systems



# Assoc. Prof. Sirikanjana Thongmee

**Department of Physics**

E-mail: fscipsj@ku.ac.th

## Keywords

Nanomaterials, Magnetic materials, Gas sensors, Quantum dot, Graphene and Photocatalysts



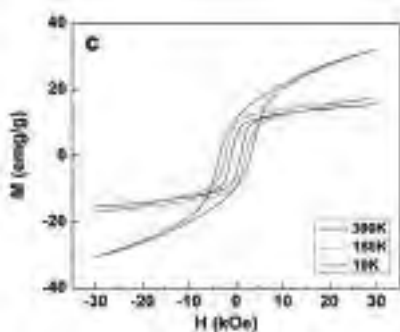
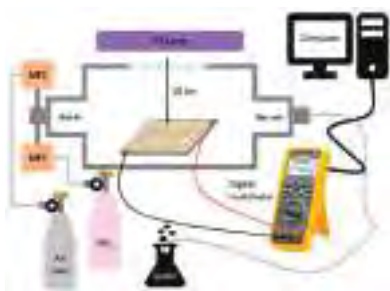
16310967400



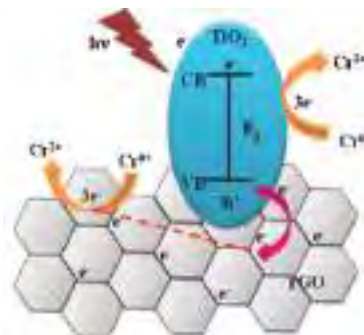
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**Fabrication and characterization of novel nanomaterials with environmental and agricultural application**



## Activated Carbon



## Research Focuses

- To develop nanomaterials by electrospinning, sol-gel, and hydrothermal methods.
- To understand the ferromagnetic behavior of nanomaterials
- To develop co-doped nanoparticles for photocatalytic and gas sensor applications
- To develop nanohybrids for environmental and agricultural applications

## Implication and applications

- Photocatalysis
- Graphene based materials
- Gas sensors
- Biochar
- Dye and metal removal
- Nanofertilizer



# Dr. Sorasak Phanphak

**Department of Physics**

E-mail: Sorasak.pha@ku.th

## Keywords

Nitrite ( $\text{NO}_2^-$ ) detection and localization:  
devise novel method of detection  
Optical interaction on 2D materials:  
using LC to create a sensitive platform

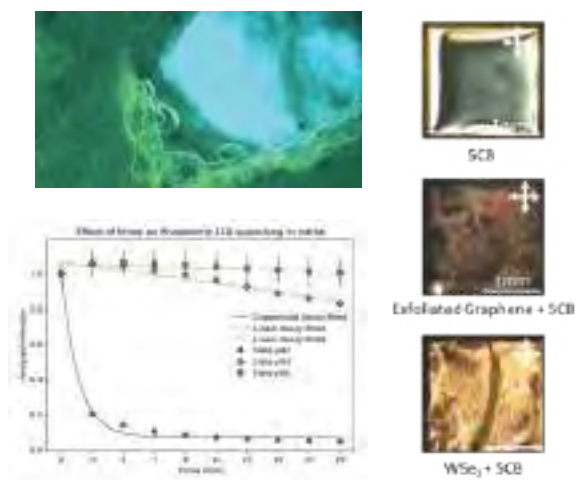
## Research field

- Using novel optical technique for molecular detection
- Highly sensitive biological sensors

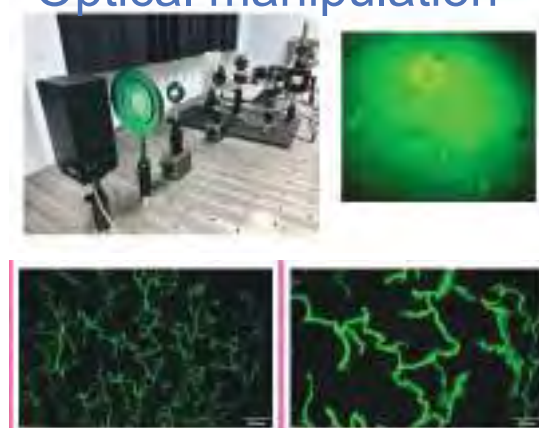
## Future directions

- Biological detection on target cells and bacteria using novel fluorescence techniques
- Enhance analysis methods using neuron network enhanced image processing
- Optical system for sensitive detection

## Nitrite ( $\text{NO}_2^-$ ) detection



## Optical manipulation





# Asst. Prof. Teeraphat Watcharatharapong

Department of Physics

E-mail: Teeraphat.wat@ku.th

## Keywords

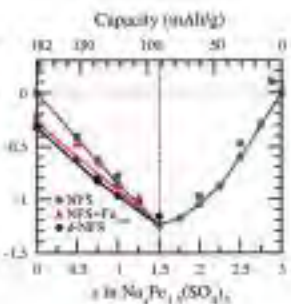
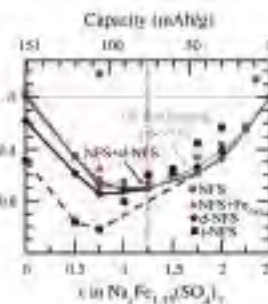
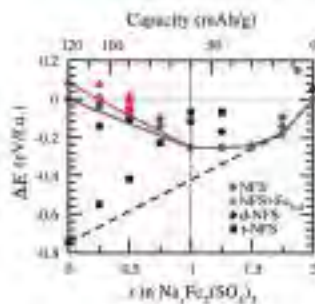
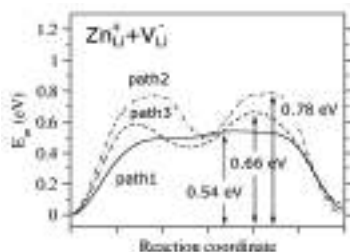
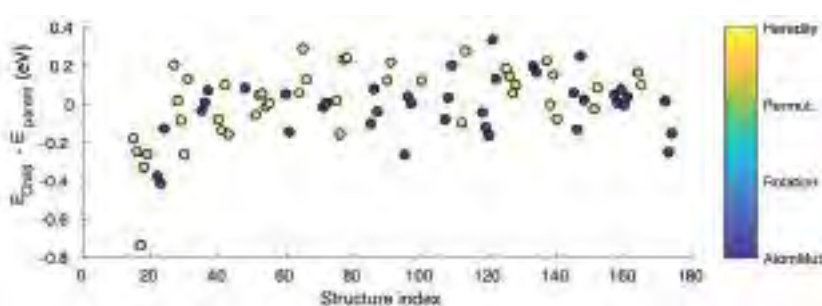
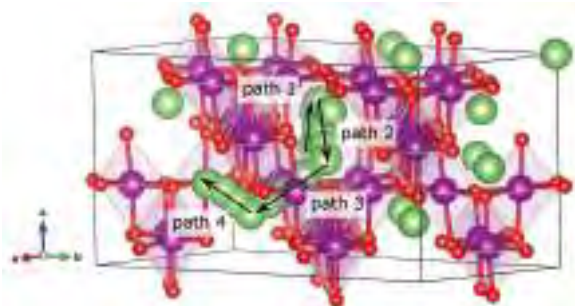
Defect thermodynamics,  
Density functional theory,  
Energy storage, Material modeling

## Research Focuses

- DFT-based simulations of defects in functional materials.
- Investigation of intercalation mechanism, phase transition and voltage profile in battery electrodes
- 2D material modeling for sustainable energy storage and conversion applications
- Crystal structural prediction of energy materials based on evolutionary algorithms



| 0000-0003-1265-5912





# Assoc. Prof. Watcharee Rattanasakulthong

Department of Physics

E-mail: fsciwr@ku.ac.th

## Keywords

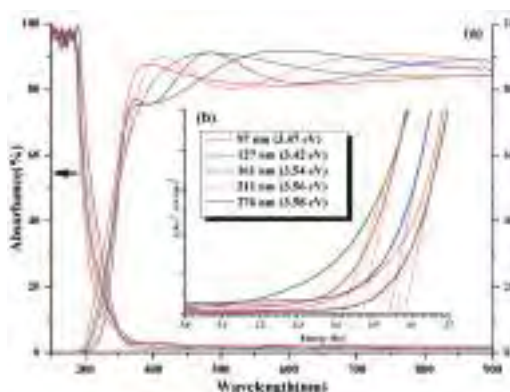
Thin Film, Magnetic Materials, Sputtered Film, AZO film, ITO film



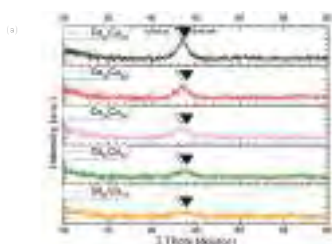
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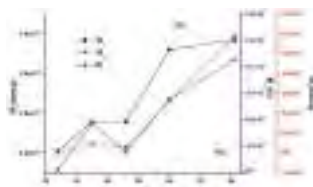
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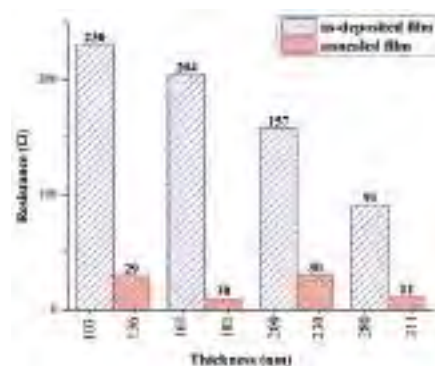
<https://iopscience.iop.org/article/10.1088/2053-1591/ad04b0>



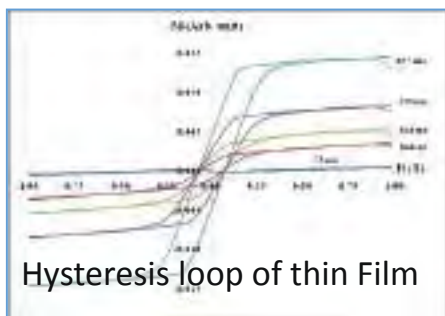
Structural properties of thin films



Magnetic parameter of thin Film



<https://www.worldscientific.com/doi/abs/10.1142/S1793604721510103>



Hysteresis loop of thin Film



Co Film Deposited on Micro-pillar Pattern



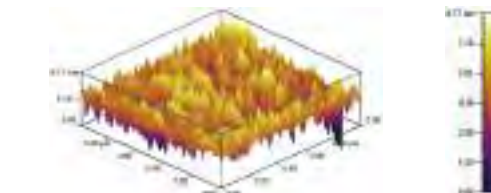
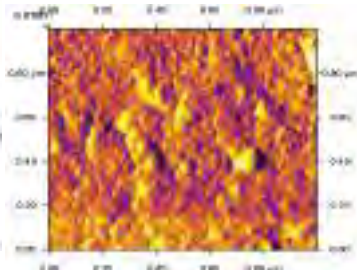
Magnetic Head



RF-sputtering Equipment



MOKE system



Surface roughness and morphology



# Asst. Prof. Witchukorn Phuthong

**Department of Physics**

E-mail: fsciwrr@ku.ac.th

## Keywords

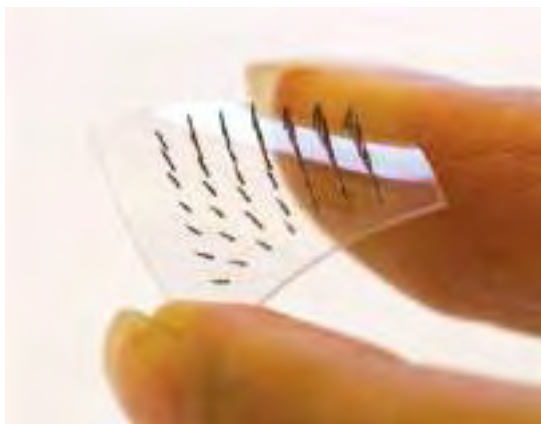
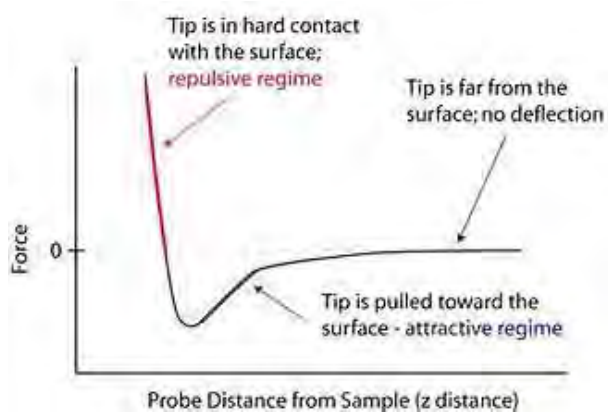
Atomic force microscopy,  
Nanomechanical properties,  
Fluid structure interaction,  
Electric field enhancement,  
Physics of microneedles



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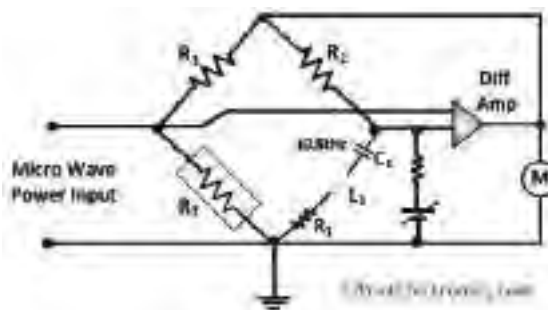
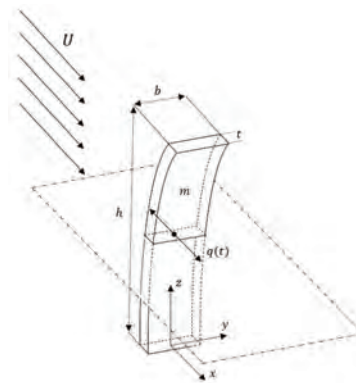


0000-0002-9811-3251



## Research Focuses

- Development of 3D-mapping of nano/micromechanical properties with morphology towards cultured meat application using atomic force microscopy
- Development of appropriate models for fluid-structure interaction toward fluid-driven energy conversion
- Finite element simulation of the electric field enhancements in metal-insulator-metal structures for the development of an affordable Terahertz radiation detector
- Finite element simulation of the skin-needle penetration for the development of cat papilla-inspired microneedles for drug applicators
- Selected IYPT problems
- Classroom action research for freshman physics





# Assoc. Prof. Kiadtisak Saenboonruang

**Department of Radiation**

E-mail: Kiadtisak.s@ku.th

## Keywords

Radiation Protection, Radiation Shielding, Radiation Processing, Nuclear Technology



55115990000



0000-0001-7401-3654



## Research Focuses

- Development of novel and enhanced X-ray, gamma, and neutron shielding materials:
  - Natural and synthetic rubbers
  - Plastics: polyethylene (PE) and polyvinyl chloride (PVC)
  - Self-healing hydrogels
- Utilization of Radiation processing for the enhancement of specific properties in materials:
  - Radiation vulcanized natural rubber films
  - Reduced graphene oxides
  - Gamma-irradiated chitin and chitosan
- Measurement of natural and artificial radionuclides in food and agriculture products



Lead-free X-ray shielding gloves



Lead-free X-ray shielding products from wood/PVC composites



Neutron shielding sheets from UHMWPE composites



Heavy metal absorbent materials from natural rubber foam filled with gamma irradiated chitosan





# Asst. Prof. Ridthee Meesat

Department of Applied Radiation and Isotopes

E-mail: fscirim@ku.ac.th

## Keywords

Gene editing, Genetic engineering, Plant cell wall, Crops, Cassava, Polysaccharides

## Research Focus

Radiation dosimetry, Radiation chemical dosimetry and applications, radiochromic dosimetry, Radiation chemistry, Nanoparticle radiation synthesis, Nuclear and radiation analytical techniques.



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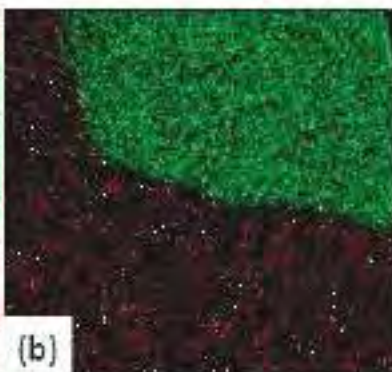
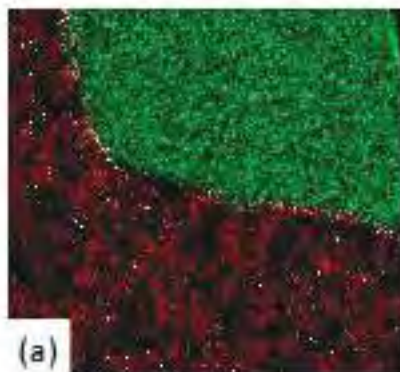
0000-0001-6099-106X



Radiochromic dosimeter extracted from a plant



Gold-nanoparticle synthesis



Ion beam analysis of Cu, P, and Hg distribution in a tooth sample

# 2

## INNOVATIVE EARTH AND SPACE TECHNOLOGIES



## INNOVATIVE EARTH AND SPACE TECHNOLOGIES

At the Faculty of Science, Kasetsart University, our research in innovative Earth and space technologies spans a wide array of pioneering fields. We explore paleontology, paleoenvironment, paleoclimate, and paleoecology to understand Earth's historical changes. Our work in sedimentology, stratigraphy, and geotourism offers insights into Earth's past and its economic geology potential. We delve into mineralogy and gemstone spectroscopy using advanced synchrotron techniques.

In geophysics, we study natural hazards like earthquakes and active faults, aiming to enhance safety and sustainable development. Our planetary science research includes creating Mars and lunar simulants for space exploration, and investigating the origins of tektites. We use cutting-edge tools like optical tweezers and laser spectroscopy to advance our understanding of liquid crystals and metamaterials.

We also focus on radiation safety, developing calibration systems for airborne radiation and exploring the applications of radioactive materials in industry and food. Our interdisciplinary approach integrates geology, archaeology, and space science to push the boundaries of knowledge and technology, ensuring a sustainable future both on Earth and beyond.



# Asst. Prof. Chatchalerm Ketwetsuriya

Department of Earth Sciences

E-mail: fscicek@ku.ac.th

## Keywords

Paleontology, Paleoenvironment, Paleoclimate, Paleoecology, Paleogeography

## Research Focuses

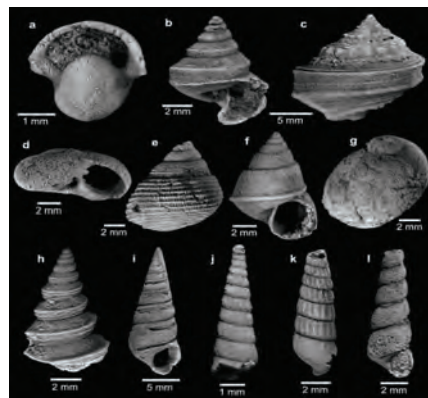
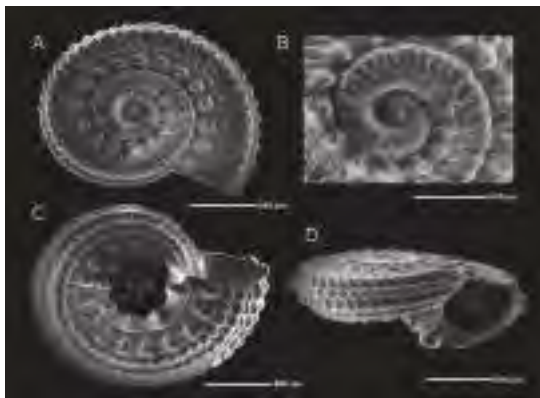
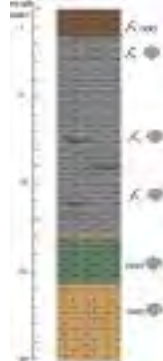
- Changes of biodiversity of marine mollusks over time. Bioindicators of marine pollution.



56578514800



0000-0001-9362-6421





# Dr. Chawisa Phujareanchaiwon

Department of Earth Sciences

E-mail: chawisa.phuj@ku.th

## Keywords

Depositional Environment, Sedimentology, Stratigraphy

## Research field

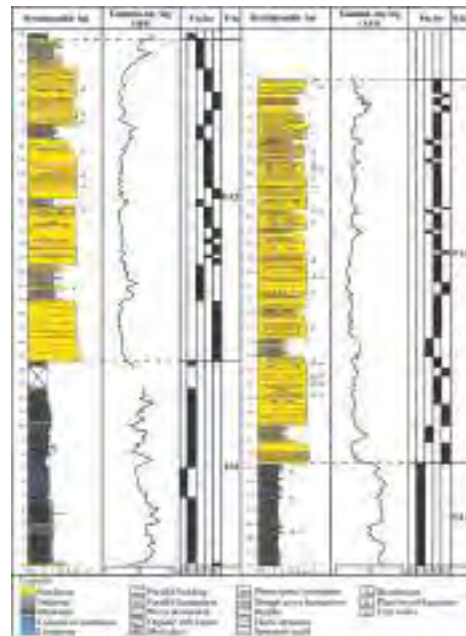
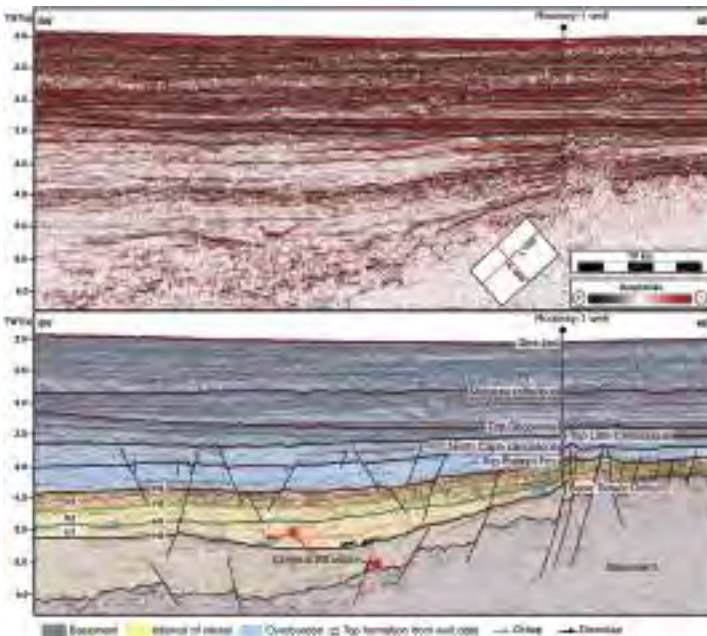
- Depositional environments
- Facies analysis
- Seismic interpretation
- Source rocks



57220594059



0009-0008-7361-6793





# Asst. Prof. Krit Won-in

Department of Earth Sciences

E-mail: fscikrit@ku.ac.th

## Keywords

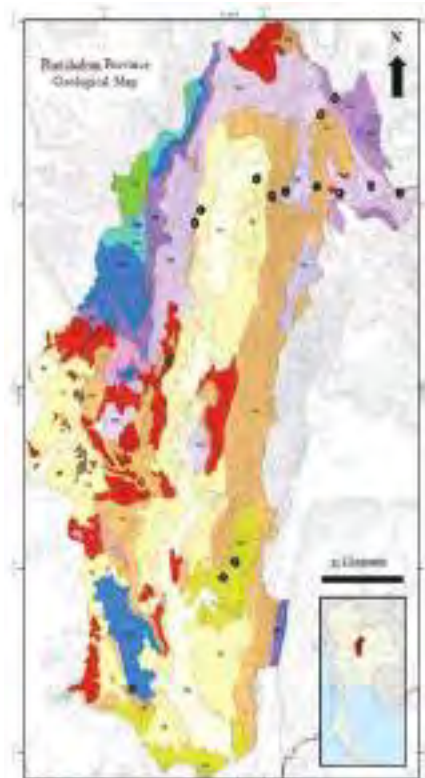
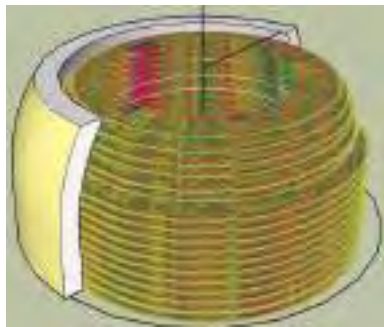
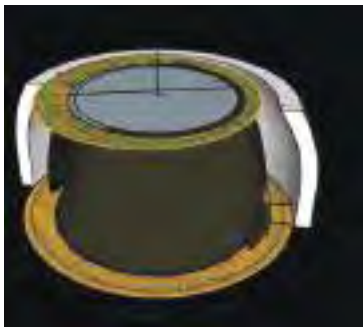
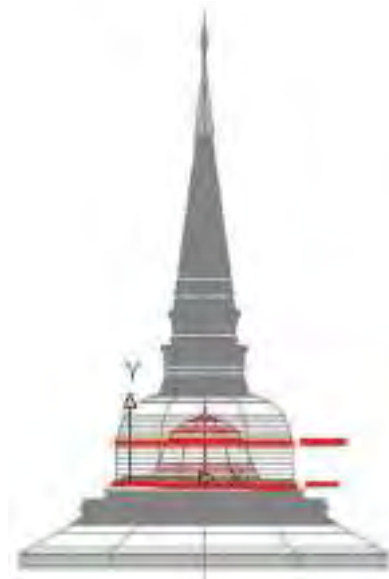
Geology, Geoarchaeology, Geotourism, Archaeological Dating



6505627974



0009-0003-9573-0937





# Asst. Prof. Ladda Tangwattananukul

Department of Earth Sciences

E-mail: fscildt@ku.ac.th

## Keywords

Economic Geology, Geology, Tectonic setting, Mineralogy, Mineral exploration

## Research Focuses

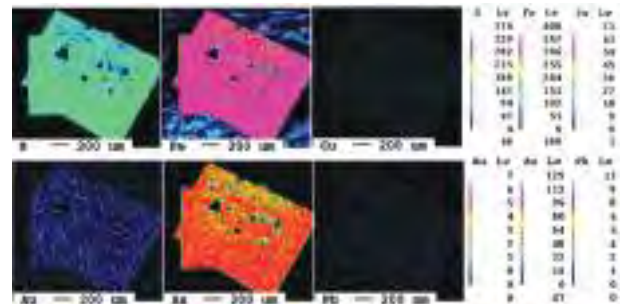
- Mineral exploration
- REE mineral for green technology
- Li-minerals
- Potash deposit Resource of Au, Ag, Cu, Fe in Thailand and SE
- Geology of Thailand and SE
- Tectonic setting



56084939800



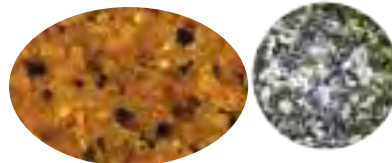
0000-0002-8767-2955



Bang Saphan Gold deposit



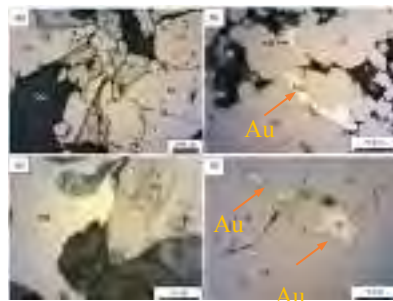
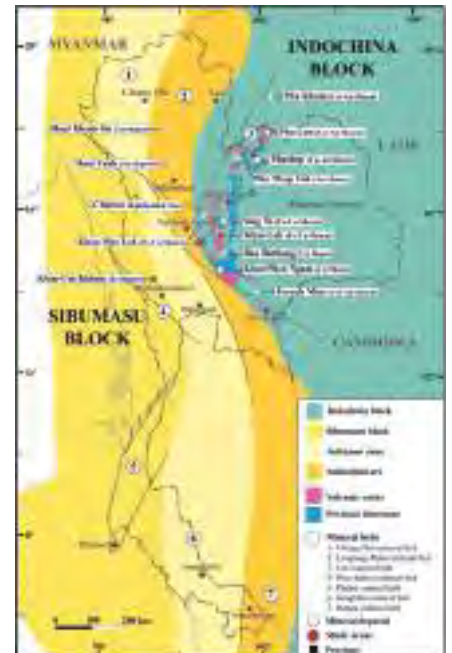
Rare earth mineral separation



UNESCO, Petrified wood at Ban Tak, Thailand



Potash deposit in Thailand





# Asst. Prof. Natthapong Monarumit

Department of Earth Sciences

E-mail: fscinom@ku.ac.th

## Keywords

Mineral, Gemstone, Spectroscopy, Synchrotron

## Research Focuses

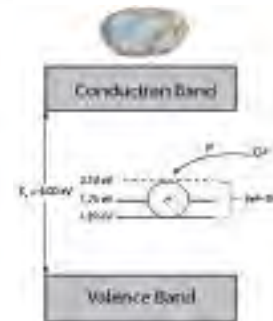
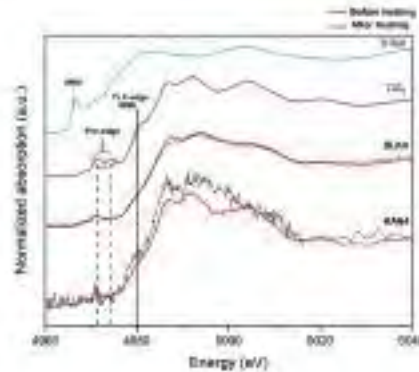
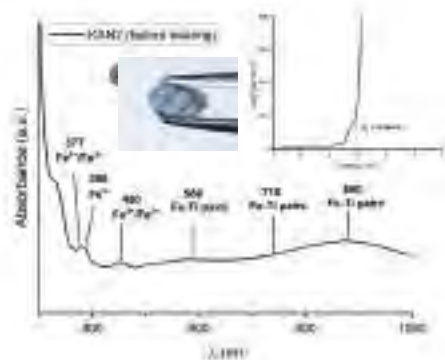
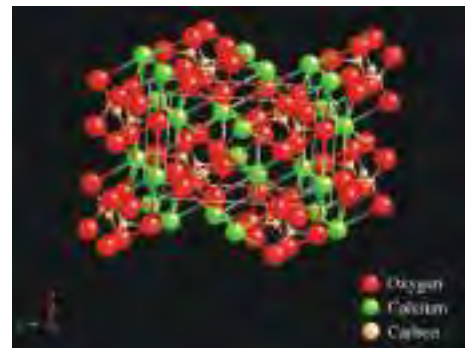
- Spectroscopy and synchrotron application on mineral science
- Color mechanism and local structure of gems and mineral



56835750700



0000-0001-5260-0671







# Assoc. Prof. Passakorn Pananont

Department of Earth Sciences

E-mail: fscipkp@ku.ac.th

## Keywords

Earthquake, Active Fault, Natural Hazard, Tectonics, Geophysics, Natural Resources, Crustal and Lithospheric Structure and Properties, Groundwater, Archaeology, Sustainable Development

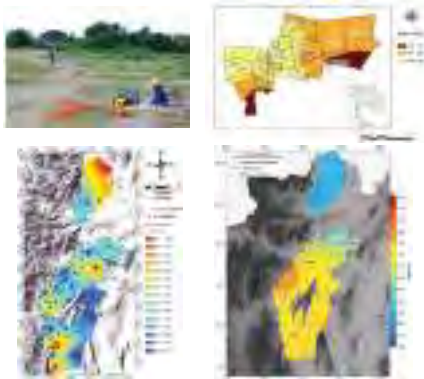


8262155800



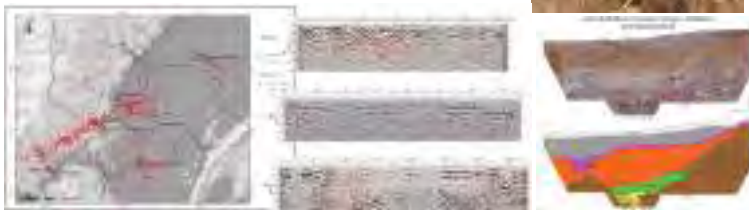
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### 1. Seismic Hazard and Site Effects of Big Cities in Thailand



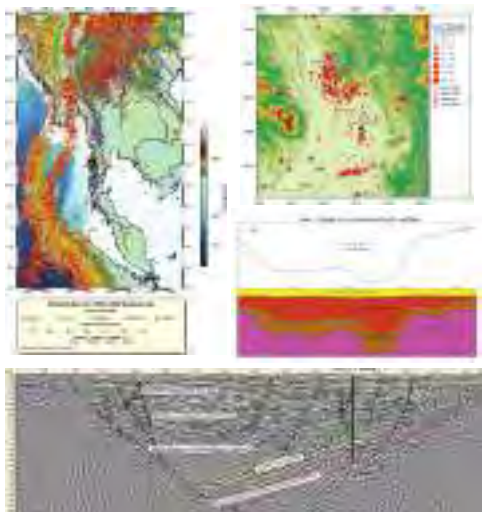
Integrated geophysical methods to study the site effects, especially basin geometry, natural period, shear wave velocities and seismic amplification of the ground that responds to the seismic wave.

### 2. Paleoseismology and Active Faults



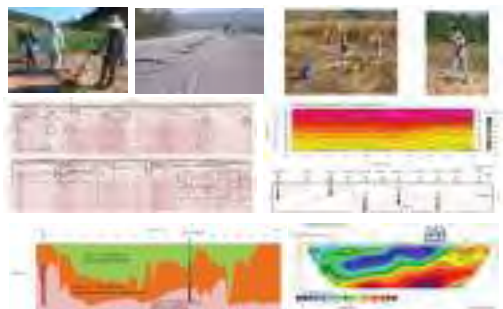
Multidisciplinary of earthquake geology, seismology and geophysics to understand the nature of the active and hidden faults in Thailand.

### 3. Seismology and Tectonics of Thailand



Integration of earthquakes, seismic reflection and gravity data can help construct a tectonics evolution model and lithospheric structures and properties of Thailand and can be utilized in various applications such as the natural resources explorations and natural hazard.

### 4. Geophysical Applications in Geotechnical Engineering, Environmental and Geohazard



Integrated geophysical methods are used for applications in geotechnical, environmental and geohazard problems such as carbon sequestration, ground water contamination, alternative energy resources, archaeology, land subsidence, sinkhole and landslide.



# Dr. Sarinya Paisarnsombat

Department of Earth Sciences

E-mail: fscisnpa@ku.ac.th

## Keywords

Planetary, Space, Meteorite, Tektite, Mars simulant, Lunar concrete, Synchrotron

## Research Focuses

- Thailand Mars Simulant (TMS) and its application in space science
- Lunar geology and exploration
- Origins and chemistry of Tektites and high-pressure natural glasses



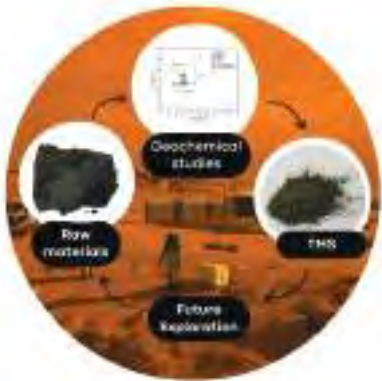
57189577004



0000-0001-5179-3205



Lunar geology and exploration



Thailand Mars Simulant (TMS) and its application in space science



Origins and chemistry of Tektites and high-pressure natural glasses



# Asst. Prof. Somruedee Sakkaravej

Department of Earth Sciences

E-mail: fscisrd@ku.ac.th

## Keywords

Gemology, Mineralogy, Industrial Minerals, Gem-Geo Tourism

## Research Focuses

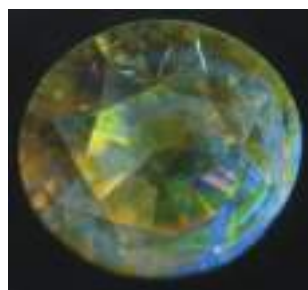
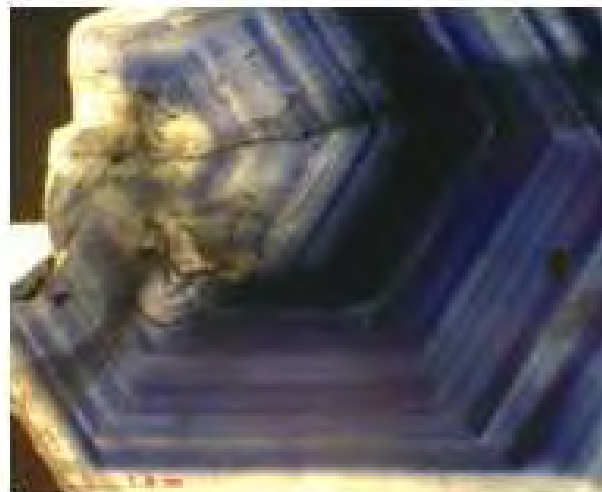
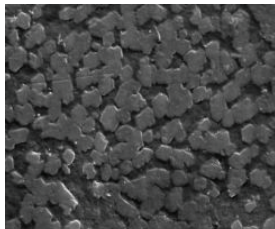
- Gemstone Occurrences.
- Characteristics of gemstones in Thailand.
- Gemstone Enhancement.



56372309600



0000-0001-7477-842X





# Asst. Prof. Apichart Pattanaporkratana

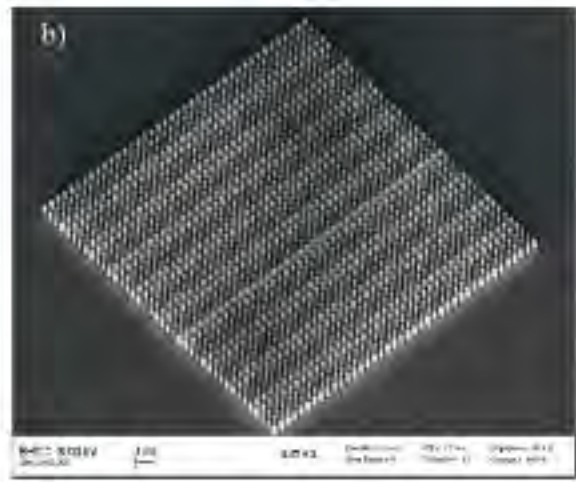
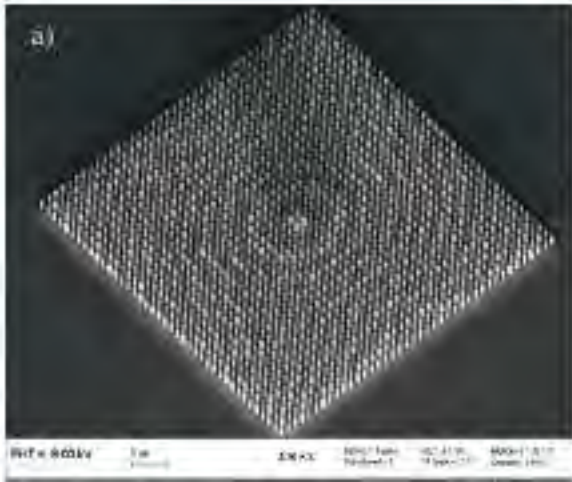
Department of Physics

E-mail: fsciacp@ku.ac.th



Research areas

- Optical Tweezers
- Liquid Crystals
- Laser Spectroscopy Techniques.



Design and Investigation of a metalens for efficiency enhancement of laser-waveguide coupling in a limited space system  
H. Laeim, et al. (2022) <https://doi.org/10.1117/12.2629789>

Thailand Liquid Crystals in Space (Co-Investigator)



<https://thestandard.co/thailand-liquid-crystals-in-space/>



# Assoc. Prof. Nattaporn Chattham

Department of Physics

E-mail: nattaporn.c@ku.ac.th

## Keywords

Liquid Crystals, Optics, Metamaterials, Space experiment, System Engineering

## Research Focuses

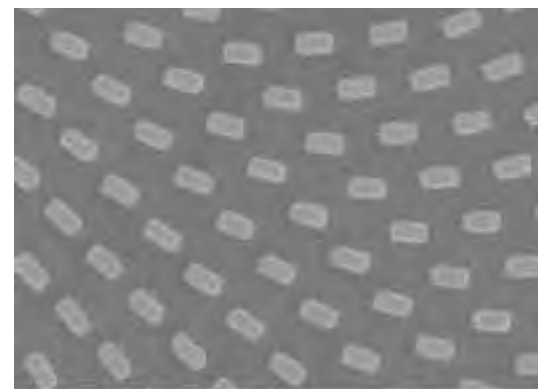
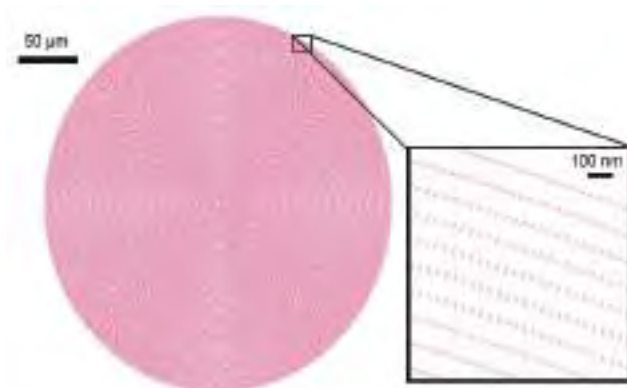
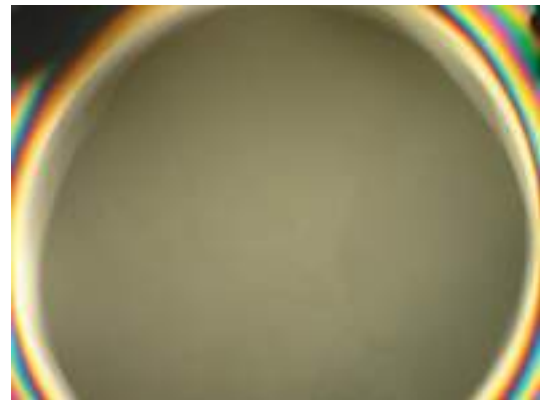
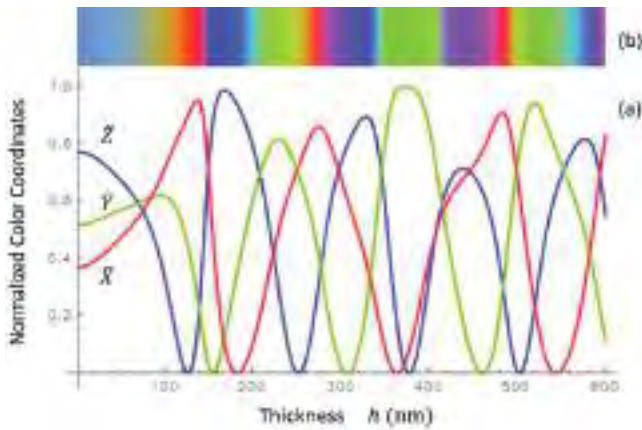
- Liquid crystals in space for the development of LCD for future space applications
- System Engineering for scientific payload construction
- Metamaterials and Metalens for miniaturizing and simplifying optical systems



15831128600



0009-0005-8296-8107





# Dr. Peera Pongkitiwanchakul

Department of Physics

E-mail: fscipepo@ku.ac.th

## Keywords

Astrophysical Plasmas

## Research Focuses

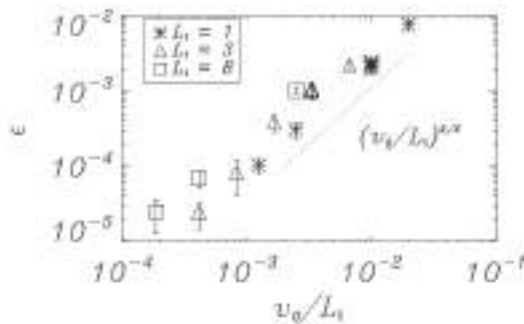
Analyzing spacecraft data, performing computer simulations or creating theoretical models for plasma phenomena in astrophysical events, such as shocks magnetic reconnection, and turbulence.



35240679400



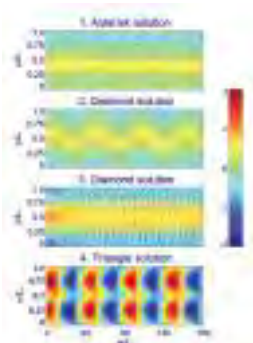
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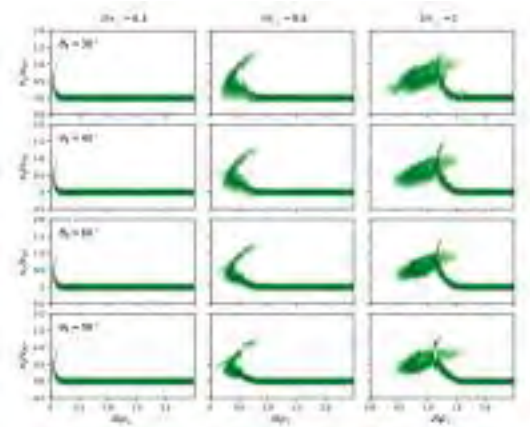
A model for the solar coronal heating.

$$\begin{aligned} \langle \Delta X^2 \rangle &= 2I_x - 2J_x \\ &= \frac{4}{B_0^2 (2\pi)^{3/2}} \int \int_0^z \int_0^{z-z'} P_{xx}(\mathbf{k}) e^{-ik_z \Delta z'} \\ &\quad \times e^{-((b_x^2)k_x^2 + (b_y^2)k_y^2) \Delta z^2 / (2B_0^2)} \\ &\quad \times [1 - \cos(k_x X_0) e^{-(\mathcal{D}_x k_x^2 + \mathcal{D}_y k_y^2) z^2 / 2}] d\Delta z' dz' d\mathbf{k}. \end{aligned}$$

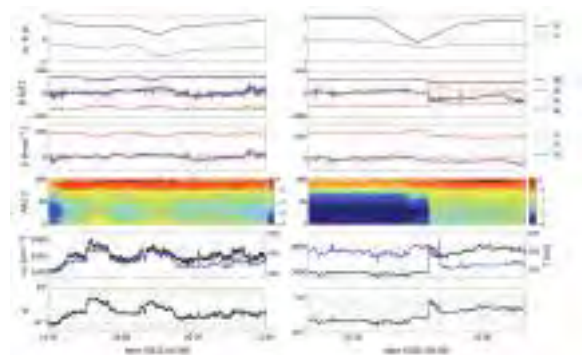
A theoretical model to simply explain the turbulent behavior of the interplanetary magnetic field



Nonlinear dynamo waves that might be related to the solar cycle.



Scaling parameters for Shock formation from large particle-in-cell simulations



Data from the Parker solar probe (the fastest and the closest spacecraft ever to the Sun)



# Assoc. Prof. Watcharee Rattanasakulthong

Department of Physics

E-mail: fsciwr@ku.ac.th

## Keywords

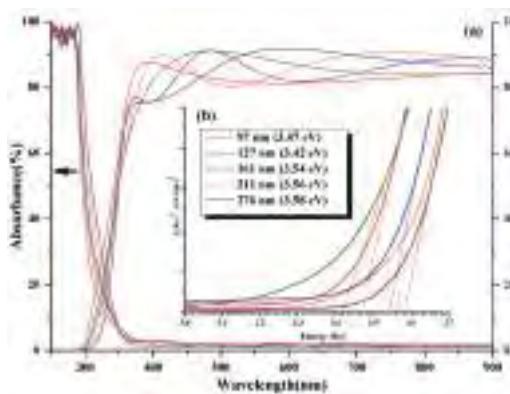
Thin Film, Magnetic Materials, Sputtered Film, AZO film, ITO film



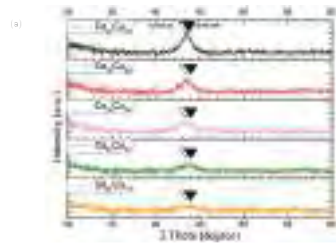
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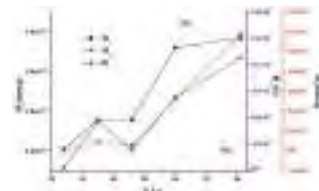
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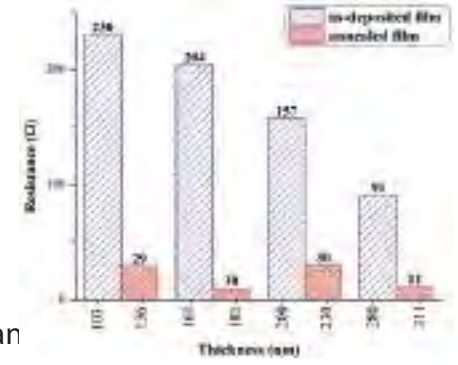
<https://iopscience.iop.org/article/10.1088/2053-1591/ad04b0>



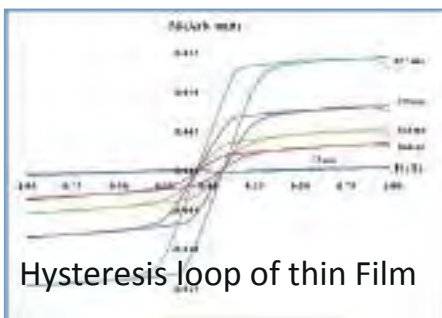
Structural properties of thin films



Magnetic parameter of thin Film



<https://www.worldscientific.com/doi/abs/10.1142/S1793604721510103>



Hysteresis loop of thin Film



Co Film Deposited on Micro-pillar Pattern



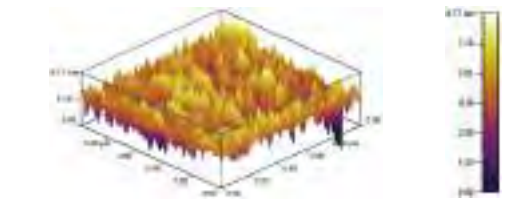
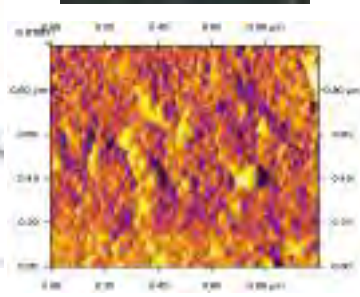
Magnetic Head



RF-sputtering Equipment



MOKE system



Surface roughness and morphology



# Asst. Prof. Chanis Rattanapongs

Department of Applied Radiation and Isotopes

E-mail: fscicnp@ku.ac.th

## Keywords

Radon, Thoron,  
Environmental radiation measurement,  
Dose assessment



53164625600



0000-0001-6898-9917



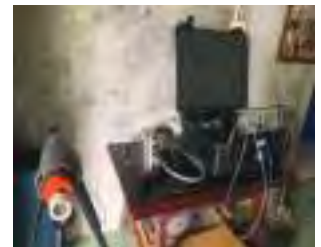
## Research Focuses

- Measurement of the amount of radiation in the environment
- Analyze the amount of radiation contaminants in industry and food.
- Radiation dose assessment for radiation safety
- Radioactive waste management and industrial waste pretreatment
- Development of an instrument calibration system to measure
- airborne radiation and aerosol radioactive particles.

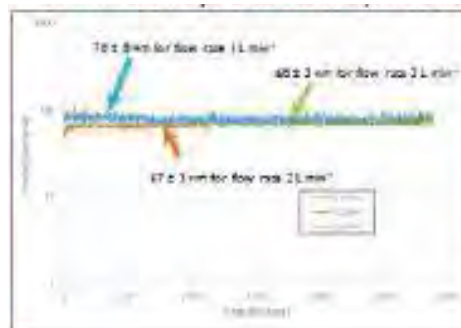
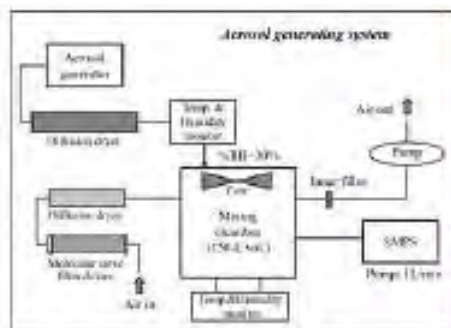
## Radon-thoron and decay products monitoring device



## Radiation dose assessment on site study



## Aerosol generator calibration system for measuring radioactive particles





# 3

## SUSTAINABLE ENERGY INNOVATIONS



## SUSTAINABLE ENERGY INNOVATIONS

At the Faculty of Science, Kasetsart University, our research is at the forefront of sustainable energy and material sciences. We focus on developing advanced materials for energy conversion and storage, including inorganic nanomaterials, photoelectrocatalysts, and photocatalysts. Our work on 2D materials-based catalysts enhances hydrogen evolution reactions (HER) and oxygen evolution reactions (OER).

We upcycle spent primary batteries for rechargeable battery and supercapacitor applications, pushing the boundaries of material upcycling. Our expertise extends to perovskite solar cells, semiconductors, and thin films, aiming to optimize solar energy conversion. Our electrochemical biosensors and spirooxazine molecular sensors are pivotal in detecting heavy metals and other pollutants. Additionally, we explore density-functional theory (DFT) for modeling defects in functional materials, focusing on sustainable energy storage and conversion applications.

In bioenergy, our research includes bioethanol production from thermotolerant yeasts and the development of plant growth-promoting technology for biomass production, contributing to renewable energy solutions. By integrating these advanced technologies, we aim to create innovative, sustainable energy solutions for a greener future.



# Assoc. Prof. Panitat Hasin

Department of Chemistry

E-mail: fscipths@ku.ac.th

## Keywords

Sustainable Energy Materials,  
Inorganic Nanomaterials,  
Energy Conversion & Storage Devices,  
Electrochemical (Bio)Sensors



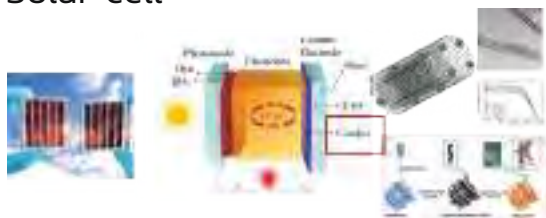
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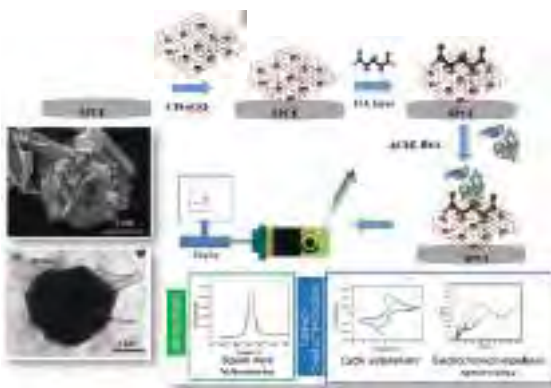
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## Solar cell



## Electrochemical Biosensor



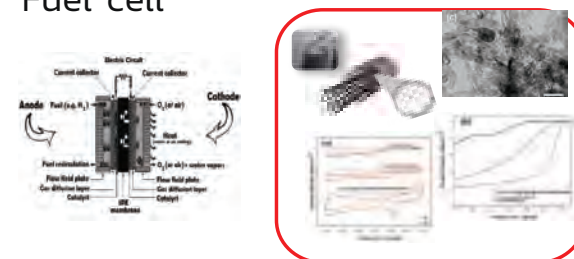
## Research Fields

- Pioneering new ways to generate green electricity from renewable energy for the future
- Synthesizing innovative solid state electro-catalysts and implementing them in electro-chemical systems to convert renewable energy into green electricity and to store excess electricity
- Developing electrochemical (bio)sensors for pesticides of interest for food control

## Supercapacitor



## Fuel cell



## Battery





# Assoc. Prof. Sutasee Kitayakarn

Department of Chemistry

E-mail: fscistsn@ku.ac.th

## Keywords

Materials Science, Photoelectrocatalysts, Photocatalysts, Catalysts, Sensors

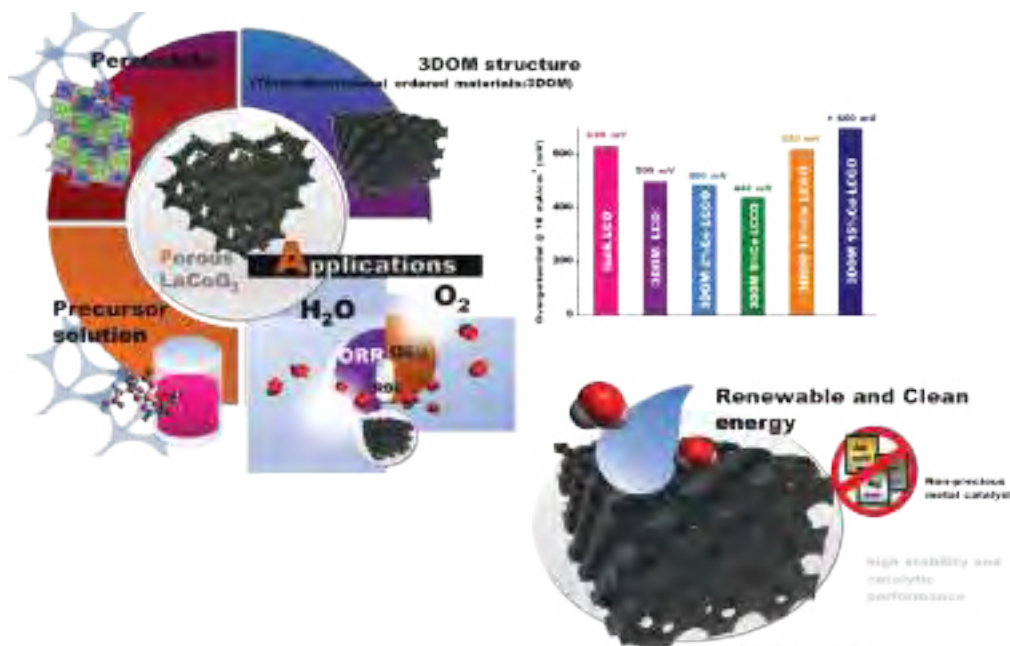
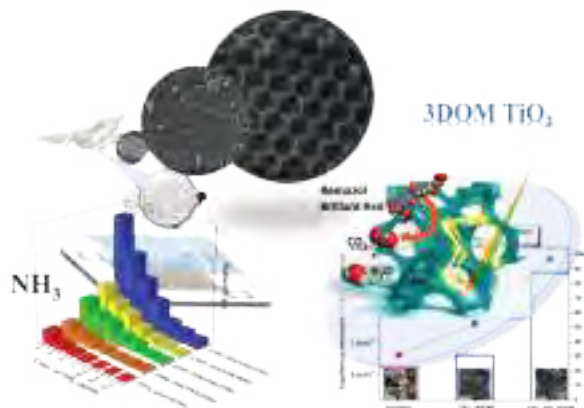
- Photocatalysts and photoelectrochemical catalysts
- Designed materials for energy storage and environment



2397780980



0000-0001-8557-6655





# Assoc. Prof. Weekit Sirisaksoontorn

Department of Chemistry

E-mail: fsciwks@ku.ac.th

## Keywords

Materials Upcycling,  
2D Materials-Based Catalysts



35175333100

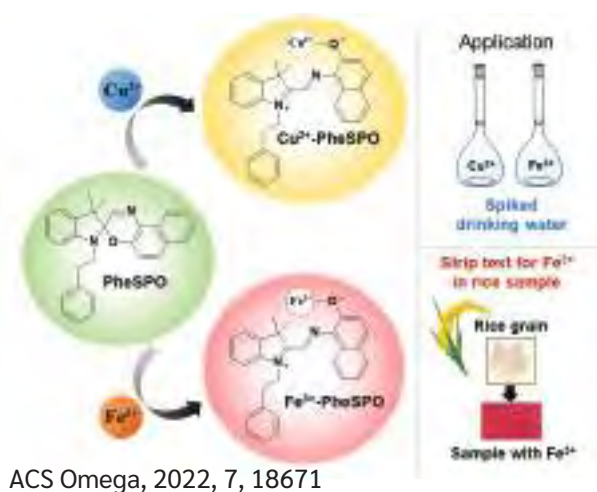
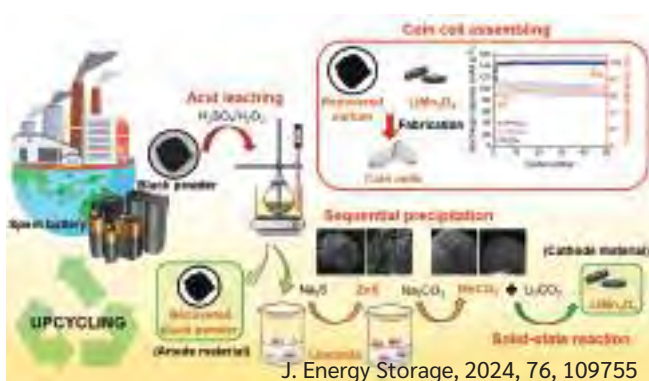
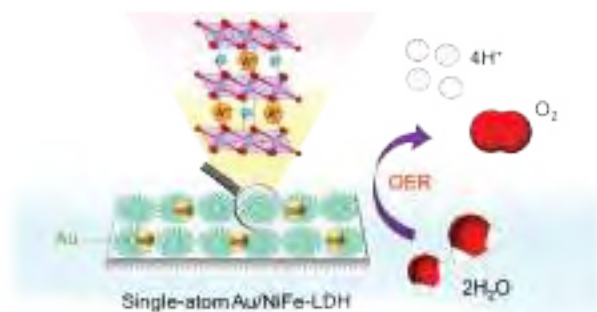


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## Research Field

- Upcycling of spent primary batteries toward the rechargeable battery and supercapacitor applications.
- Advancing 2D materials as electrocatalysts toward HER and OER applications
- Developing the spirooxazinemolecular sensors for heavy metal detection





# Asst. Prof. Wisit Hirunpinyopas

Department of Chemistry

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## Keywords

2D materials, Electrochemistry, Membranes separation, Energy storage

2D materials for electrochemical applications

1. Membrane technology for desalination and energy harvesting.
2. Electrode modification for energy storages; supercapacitors.
3. Electrocatalysts for gas production; hydrogen evolution reaction.



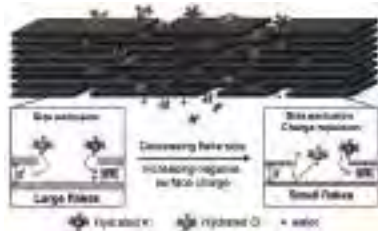
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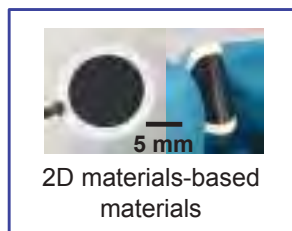


### Membrane-based filtration



*Carbon* **2020**, 156, 119-129.

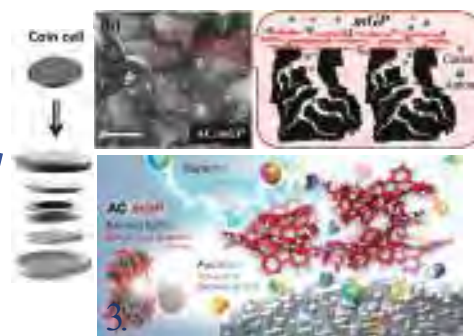
*Nanoscale* **2023**, 15, 8716-8729.



### Catalyst support



### Electrode binder



*ACS Appl. Mater. Interfaces* **2023**,  
52401-52414.



# Assoc. Prof. Pongthep Prajongtat

Department of Materials Science

E-mail: fscipop@ku.ac.th

## Keywords

Perovskite solar cells, Nanomaterials, Semiconductors, Thin films, Solar energy conversion, DFT

## Research Interests

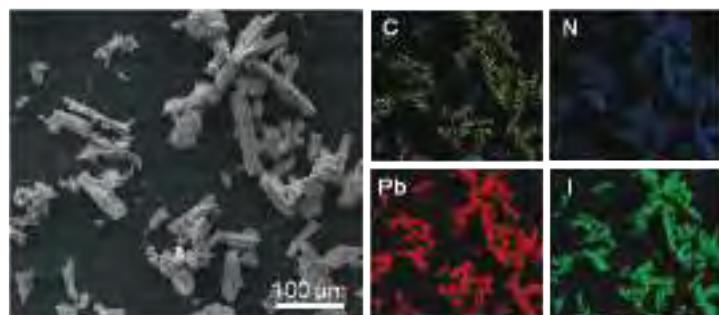
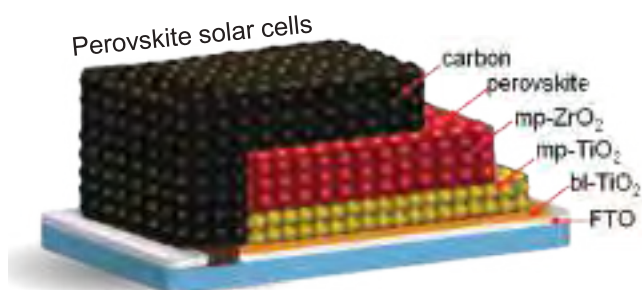
- Fabrication and characterization of low-cost and highly efficient perovskite solar cells
- Chemical synthesis and modification of nanomaterials and thin films
- Density functional theory (DFT) simulations of semiconductors and solar cell materials



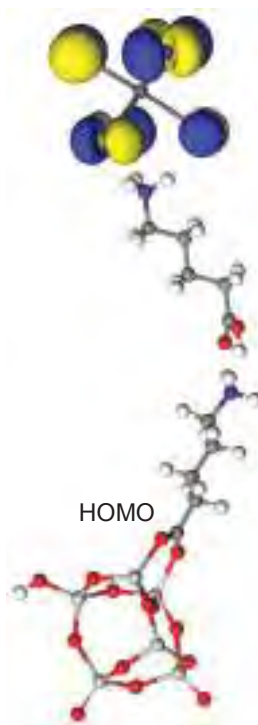
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0000-0001-9618-2504



Chemical synthesis and modification of nanomaterials





# Assoc. Prof. Thidarat Supasai

Department of Materials Science

E-mail: fscitrs@ku.ac.th

## Keywords

Renewable Energy, Solar Cells, Thin Films, Surface/Interface Modification, Defect Analysis

- Fabrication and characterization of low-cost and highly efficient perovskite solar cells
- Chemical synthesis and modification of nanomaterials and thin films
- Density functional theory (DFT) simulations of semi-conductors and solar cell materials



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0000-0001-9876-3687



### High-quality thin-film fabrication

**Sequential thermal evaporation**

**Flexible solar cell**

**Film morphology**

For more info, please visit our website

- Scalability
- Low material waste
- Layer-by-Layer control
- High purity and quality of films
- High resolution and uniformity

### Material and device characterizations

**Surface/interface characterizations**

**Device efficiency and durability**





# Asst. Prof. Chanita Boonmak

Department of Microbiology

E-mail: fscictb@ku.ac.th

## Keywords

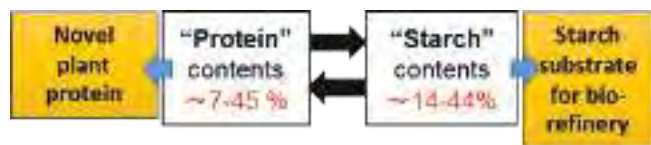
Environmental Microbiology, Bacteria, Plant-Microbe Interaction, Wastewater



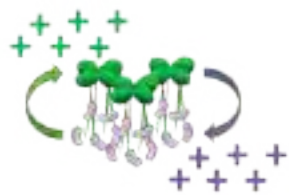
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### Duckweed



Starch Protein RICH



Duckweed functions as a water purification agent

## Research Area of Interest

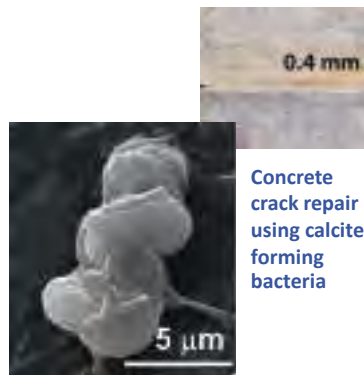
1. Multidimensional symbiosis of duckweed-microbes holobionts
2. Development of Plant growth promoting (PGP) technology for biomass production of duckweed
3. Diversity and PGP potential of mangrove bacteria
4. Biomineralization in bacteria and their applications

## The S-Curve: 10 Targeted Industries of Thailand

- Low carbon type wastewater treatment management and creation of resource recycling industries
- Novel functional plant (duckweed)-based protein for food and animal feed

## Research Collaborations

- 2017-2019 ALCA, Japan in project; "Effective Aquatic Biomass Production Utilizing Mutualistic Microorganisms: The duckweed model".
- 2021-2025 SATREPS, Japan in project; "Development of duckweed and associated microbial resource values towards Bio-Circular-Green (BCG) economy".



Concrete crack repair using calcite-forming bacteria





# Asst. Prof. Noppon Lertwattanasakul

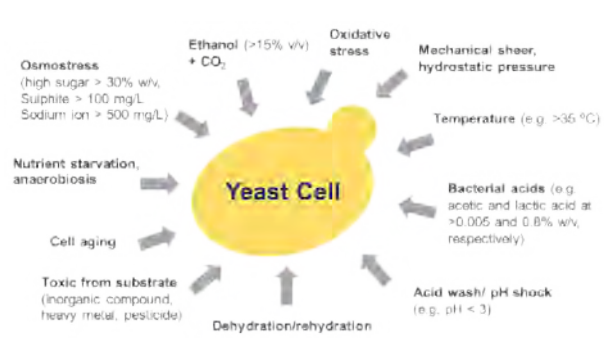
Department of Microbiology

E-mail: fscinple@ku.ac.th

## Keywords

Bioethanol, Thermotolerant yeasts, Yeast Biotechnology

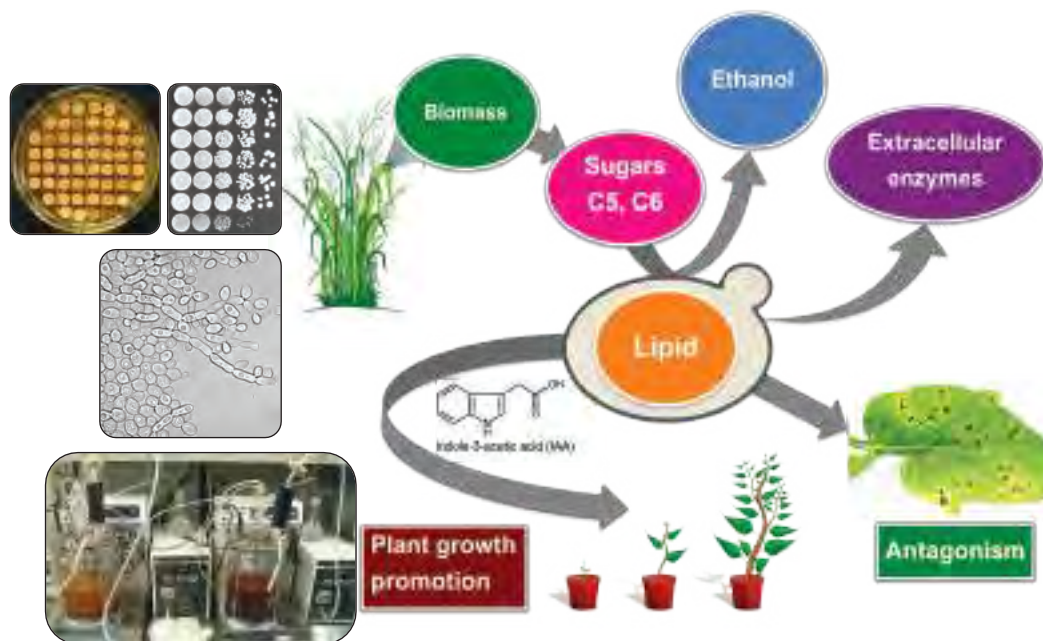
## Yeast Physiology & Biotechnology



16744019100



0000-0003-3590-7545





# Assoc. Prof. Adisak Boonchun

Department of Physics

E-mail: fscissc@ku.ac.th

## Keywords

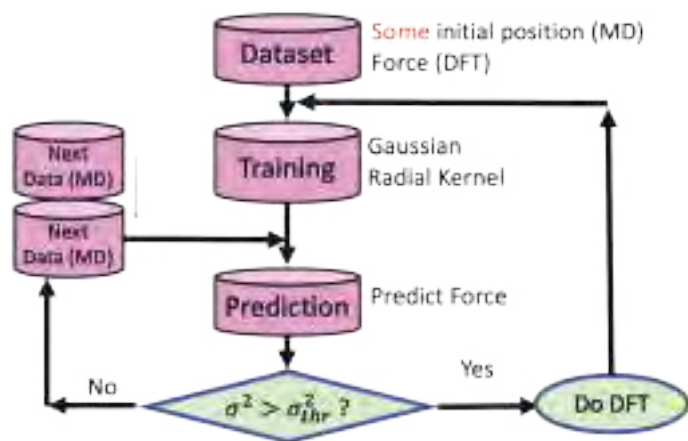
DFT-based machine learning,  
Materials Informatics

Artificial Intelligence and Modeling for Materials Science (AIMS)

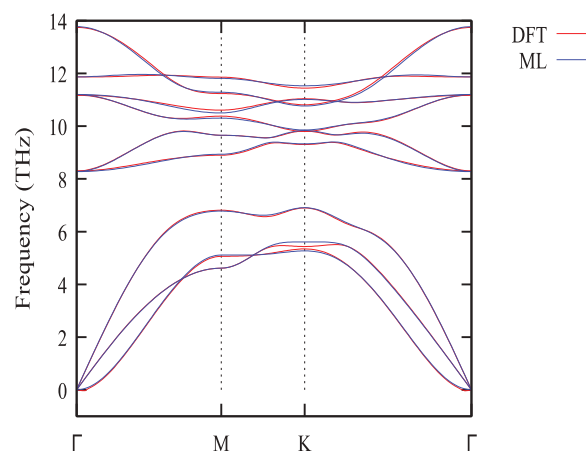
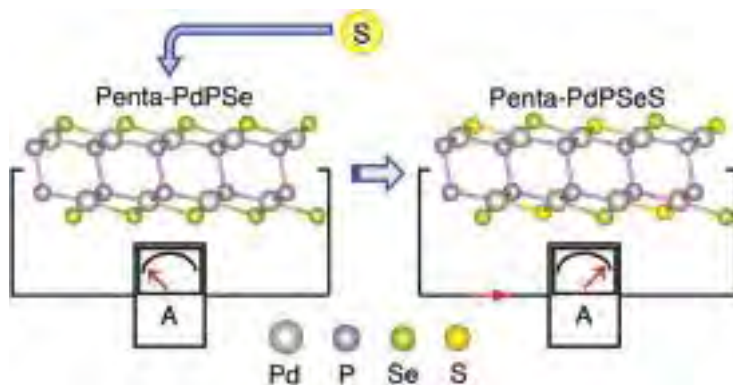
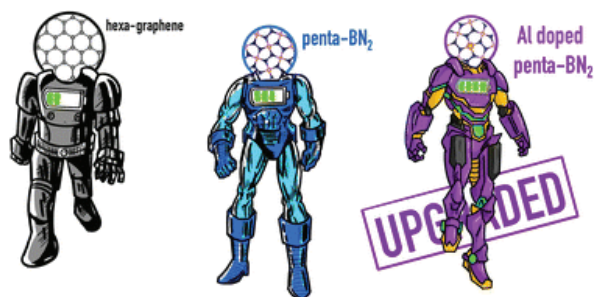
- DFT-based machine learning force field for Materials Informatics
- Computational Simulation of 2D materials as Li-ion battery materials
- Tailoring materials properties by using DFT and ML



0000-0001-6527-4537



J of Materials Chemistry C (2023) 11(17), 5825





# Assoc. Prof. Pakpoom Reunchan

Department of Physics

E-mail: Pakpoom.r@ku.th

## Keywords

Defects and Doping, Semiconductors, Density-functional calculations, Hydrogen storage

## Research Focuses

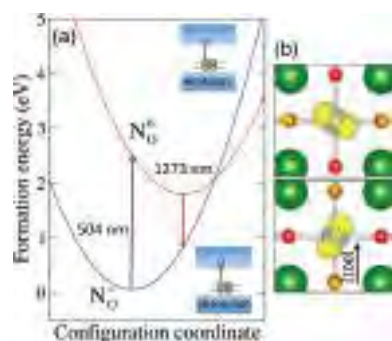
- Point defect engineering in semiconductors and functional materials: p-type/n-type controlling
- Hydrogen behaviors in optoelectronic and energy storage materials
- Surface engineering for energy storage and gas sensors
- Nanomaterials for gas sensor and hydrogen storage



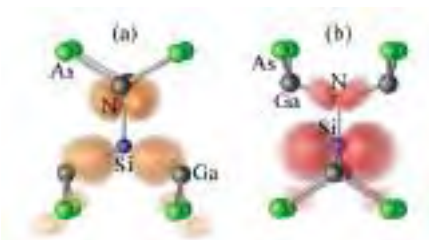
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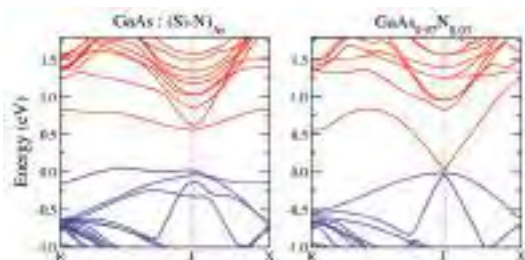
Volume 25  
Number 4  
28 January 2023  
Pages 2645-3552



PCCP

Physical Chemistry Chemical Physics  
rsc.li/pccp

2023 hot articles





# Asst. Prof. Teeraphat Watcharatharapong

Department of Physics

E-mail: Teeraphat.wat@ku.th

## Keywords

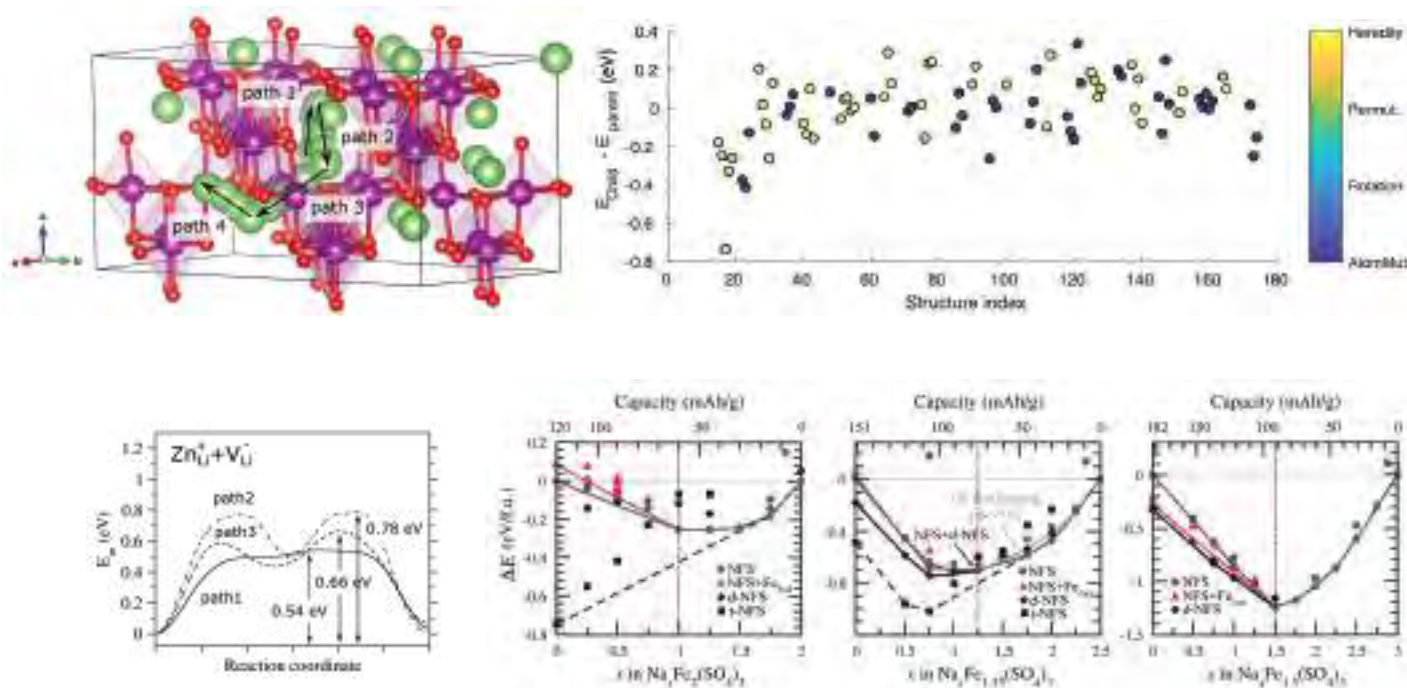
Defect thermodynamics,  
Density functional theory,  
Energy storage, Material modeling



| 0000-0003-1265-5912

## Research Focuses

- DFT-based simulations of defects in functional materials.
- Investigation of intercalation mechanism, phase transition and voltage profile in battery electrodes
- 2D material modeling for sustainable energy storage and conversion applications
- Crystal structural prediction of energy materials based on evolutionary algorithms





# Assoc. Prof. Watcharee Rattanasakulthong

Department of Physics

E-mail: fsciwrr@ku.ac.th

## Keywords

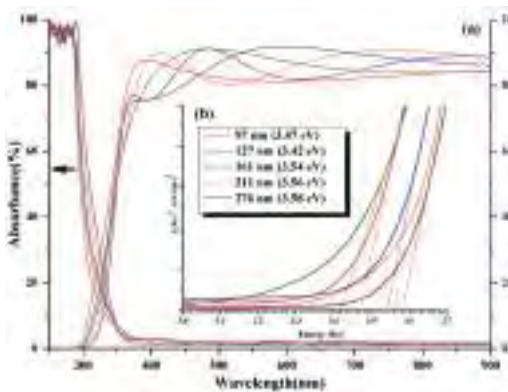
Thin Film, Magnetic Materials, Sputtered Film, AZO film, ITO film



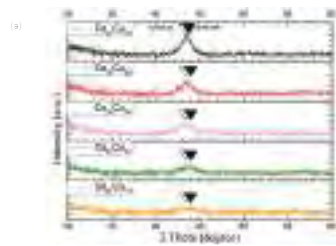
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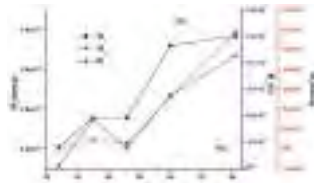
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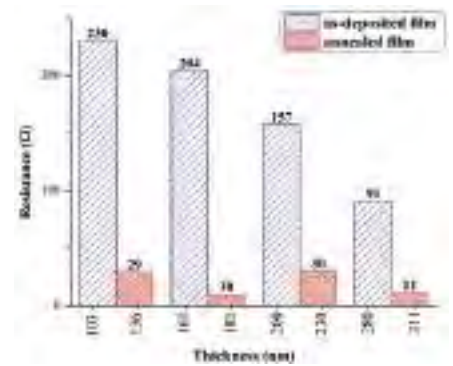
<https://iopscience.iop.org/article/10.1088/2053-1591/ad04b0>



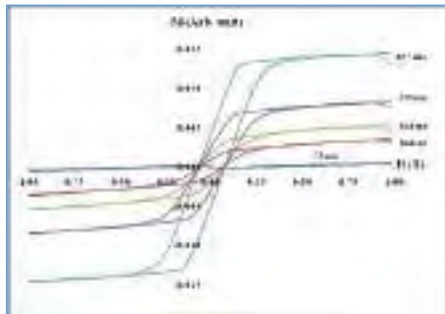
Structural properties of thin films



Magnetic parameter of thin Film



<https://www.worldscientific.com/doi/abs/10.1142/S1793604721510103>



Hysteresis loop of thin Film



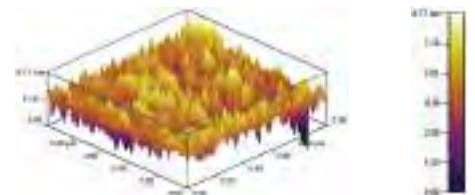
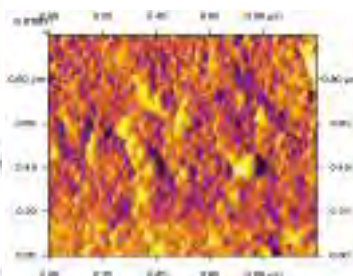
Co Film Deposited on Micro-pillar Pattern



Magnetic Head



RF-sputtering Equipment



Surface roughness and morphology

# 4

## FRONTIER RESEARCH IN NATURAL RESOURCE MANAGEMENT



## FRONTIER RESEARCH IN NATURAL RESOURCE MANAGEMENT

At the Faculty of Science, Kasetsart University, our frontier research in natural resource management encompasses a wide array of cutting-edge scientific inquiries. We delve into yeast molecular biology, biotechnology, and transcriptomics, advancing enzyme mechanisms and protein engineering. Our studies in structural biology and X-ray crystallography offer insights into DNA-binding proteins and glycoside hydrolases.

Our bioinorganic chemistry work, including antibiotic drug screening and organometallic chemistry, addresses pressing medical needs. We employ genetic enhancement techniques for economic species, focusing on sustainability and endangered wildlife conservation. Our research in plant molecular genetics, population genetics, and molecular ecology aims to enhance agricultural productivity and biodiversity conservation. We explore plant stress biology, tissue culture, and secondary metabolism to develop innovative pest and disease management strategies.

Through interdisciplinary efforts in radiation biodosimetry, nuclear technology, and environmental monitoring, we strive for sustainable development. Our integrative approach in systematics and ecology of amphibians and reptiles contributes to understanding and preserving biodiversity, ensuring a resilient future for natural resources.

By combining these diverse fields, we aim to foster innovative solutions for natural resource management and sustainability.





# Dr. Napapol Poopanitpan

Department of Biochemistry

E-mail: Fcinpp@ku.ac.th

## Keywords

Yeast molecular biology, Biotechnology, Transcriptomics

## Research field

- Control of hydrophobic substrate utilization in *Yarrowia lipolytica*
- Development of conditional accumulation of lipid in oleaginous yeast



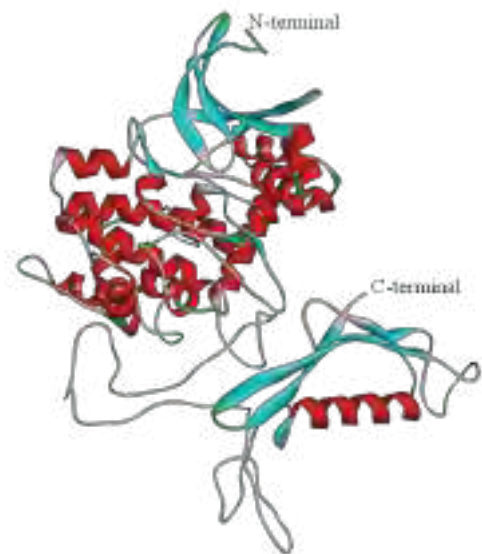
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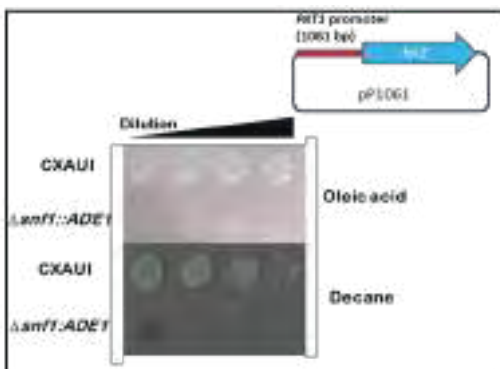
0000-0002-8571-7400



Neutral lipid staining by Nile Red



The 3D structure of YLSnfp from homology modeling by SWISS-MODEL



Protein involved in hydrophobic utilization



# Asst. Prof. Panu Pimviriyakul

Department of Biochemistry

E-mail: Panu.p@ku.th

## Keywords

Enzyme mechanism, Enzyme kinetic, Enzyme engineering, Protein structure and function



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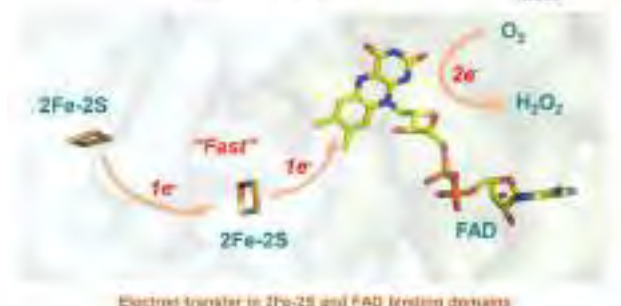
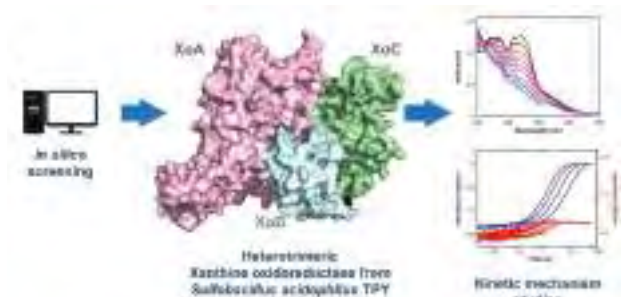
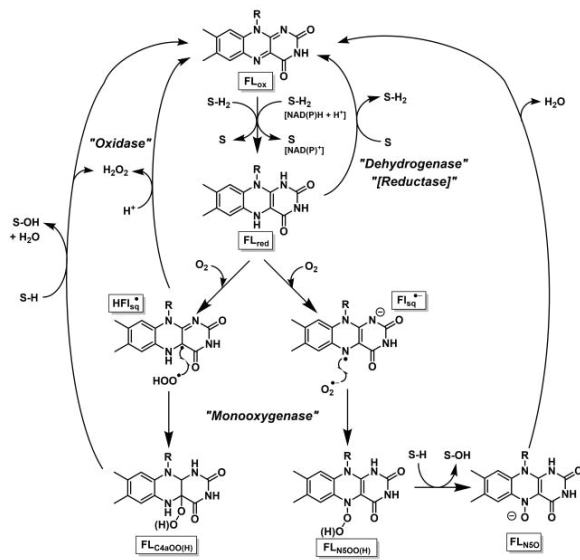


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## Research field

- Investigation of kinetic mechanism of flavin-dependent enzymes using transient kinetic approaches.
- Development of flavin-dependent enzymes as efficient biocatalyst by rational-design enzyme engineering for biodegradation and bio-detection applications.
- Expression and purification of cofactor binding proteins.
- Determination of structure and function of cofactor-assisted enzymes.



Structure and function of cofactor-assisted enzymes



Enzyme Engineering



# Dr. Permkun Permsirivisarn

Department of Biochemistry

E-mail: Permkun.p@ku.th

## Keywords

DNA-binding protein, Structural biology,  
X-ray crystallography



57205260950

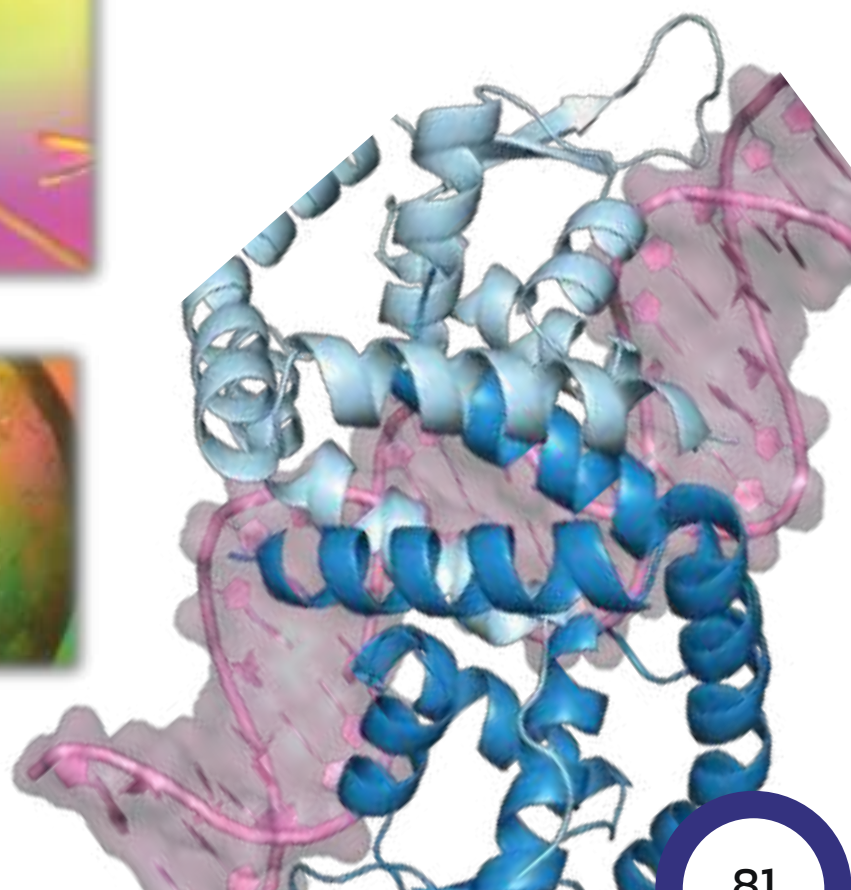
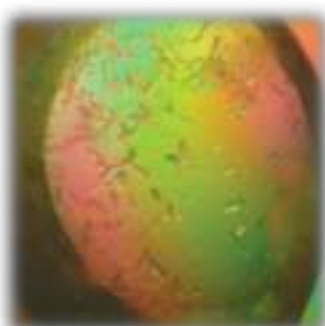
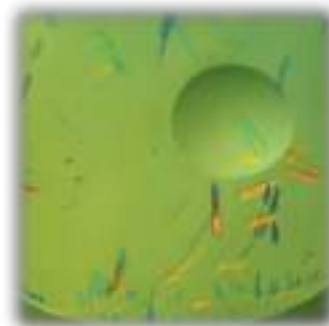


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## Research field

- Aromatic compound degradation  
: Transcription regulation in *A.baumannii*
- PET degradation  
: Characterization of *Comamonass p.TphR*
- Antigen design  
v: Influenza A virus T-cell epitope





# Assoc. Prof. Prachumporn Kongsaree

Department of Biochemistry

E-mail: fscippt@ku.ac.th

## Keywords

Glycoside hydrolases, Protein engineering, Biomass utilization, Substrate specificity

## Research theme

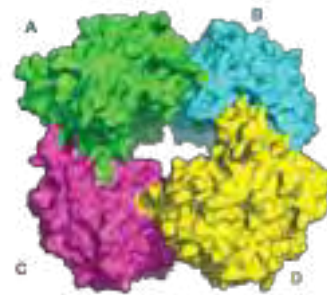
Protein engineering and applications of glycoside hydrolases



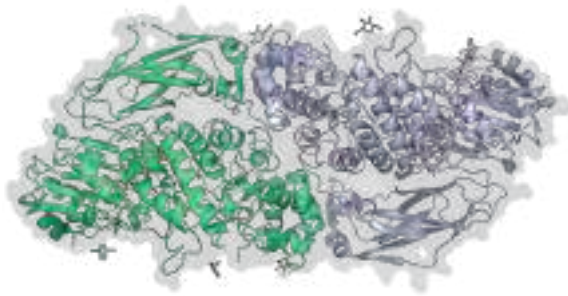
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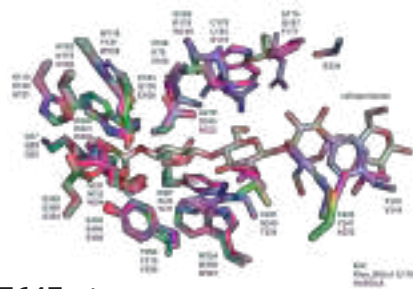
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GHI beta-Glucosidase PDB ID: 8J3M

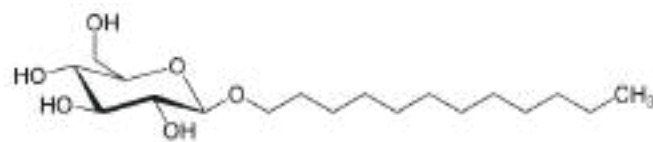


GH3 beta-Xylosidase PDB ID: 7XTJ

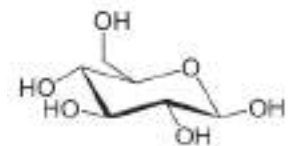
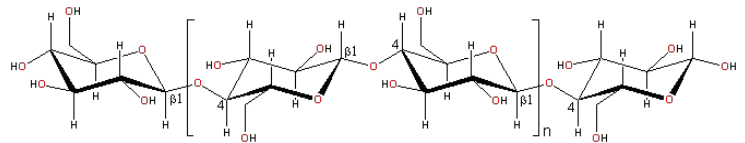


594.7647 pt

Substrate specificity



Synthesis of alkyl glucosides



Cellulolysis





# Dr. Waraporn Auiewiriyankul

Department of Biochemistry

E-mail: fsciwoa@ku.ac.th

## Keywords

Biochemistry, Applied Bioscience



57202979224

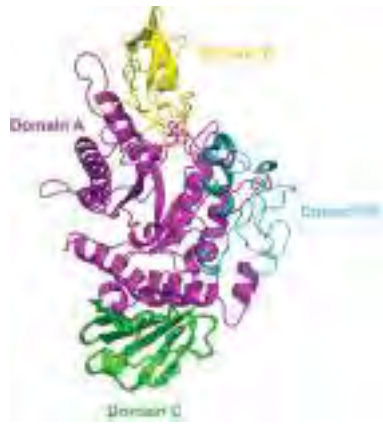
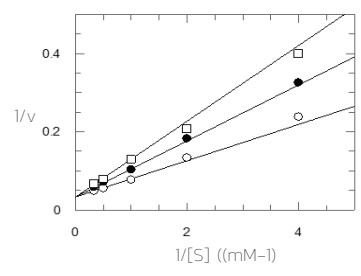
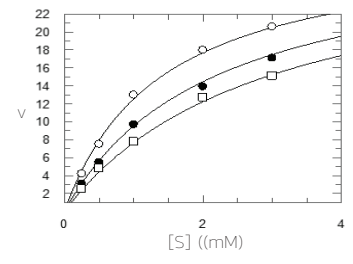


0000-0001-8994-3504



## Research field

- Biochemical characterization of alpha-glucosidase from saliva *Aedes aegypti*
- Structural and functions of Carbohydrate –degradation enzymes
- Studies of plant phytosterol derived from Duckweeds for future applications usage





# Dr. Akkharadet Piyasaengthong

The International Undergraduate Program  
in Bioscience and Technology

E-mail: akkharadet.piy@ku.ac.th

## Keywords

Bioinorganic chemistry, Antibiotic drug screening, Organometallic Chemistry



56731103000



0000-0001-9253-3514



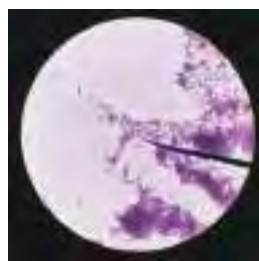
## Research Focuses

- Antibiotic drug screening  
Study the Thai herbal extracts against normal and antibiotic-resistant Cutibacterium acnes
- Advancements in Organometallic Chemistry  
Design and Synthesis of Innovative Ruthenium and Gold-Based Heterogeneous Catalysts

Antibiotic drug screening



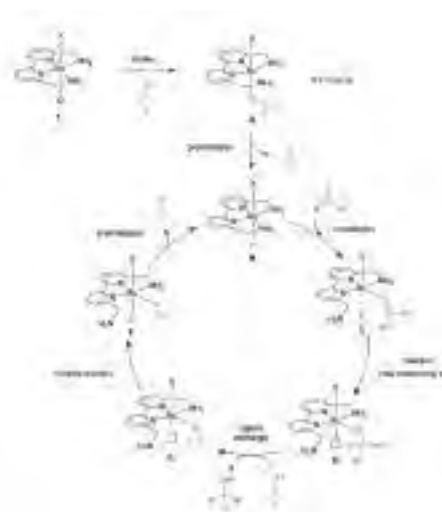
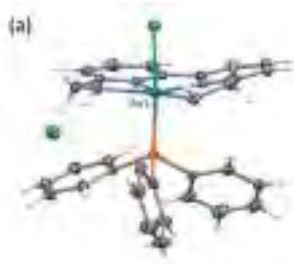
MIC



MBC



Advancements in Organometallic Chemistry





# Dr. Worapong Singchat

## The International Undergraduate Program in Bioscience and Technology

E-mail: worapong.si@ku.th

### Keywords

Comparative Genomics, Chromosome Map, Population genetics



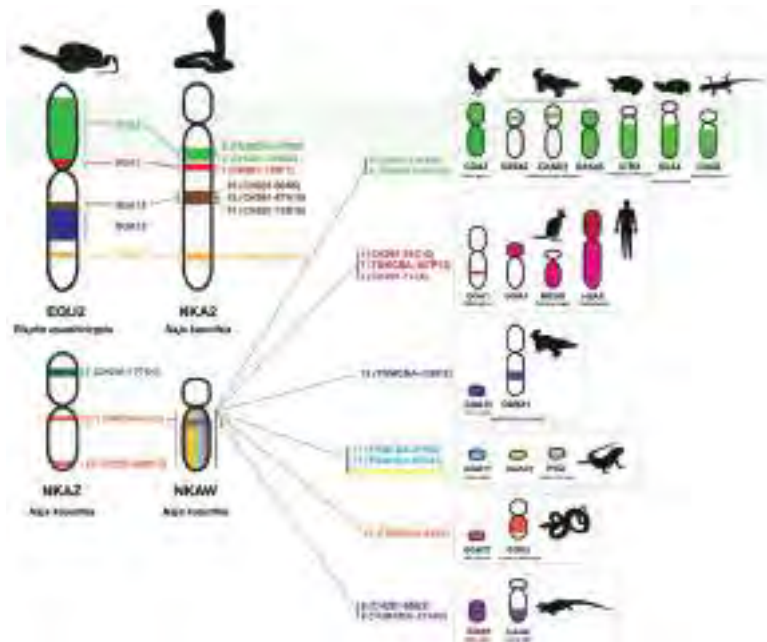
57190767025



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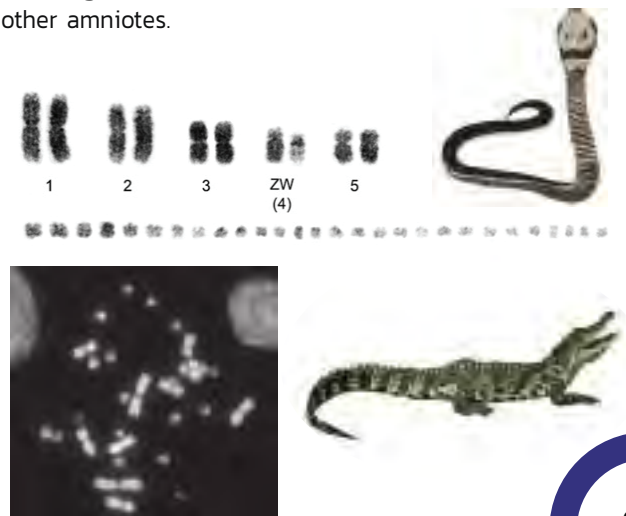
Relationship between age and relative telomere length in male (a) and female (b) Siamese cobra.



### Research field

- **Genetic Enhancement for Economic Species**  
Employing modern genetic markers, the research enhances species like chicken, crocodile, snake, and catfish. Emphasizing sustainability, it employs smart agriculture for improved breeding.
- **Endangered wildlife Conservation**  
Focusing on critically endangered animals, conservation efforts address genetic and habitat factors, aiming for biodiversity preservation and species survival.
- **Genomic Mapping for Valuable Phenotypic Traits**  
Conducting whole genome sequencing (WGS) and constructing high-quality de novo reference genomes, the project utilizes multiple platform technologies to perform comparative genomics and in silico gene mapping for traits such as sex, immune response, and growth.

Karyotype and chromosome maps of the Siamese cobra chromosome 2, and Z and W chromosomes showing homologies with the chicken, zebra finch, and several other amniotes.





# Assoc. Prof. Chalernpol Suwanphakdee

Department of Botany

E-mail: fscicps@ku.ac.th

## Keywords

Nymphoides, Piperaceae, Pollen Allergy,

Piper extract, Tropical plants, Thunbergia, Viola



54892067300

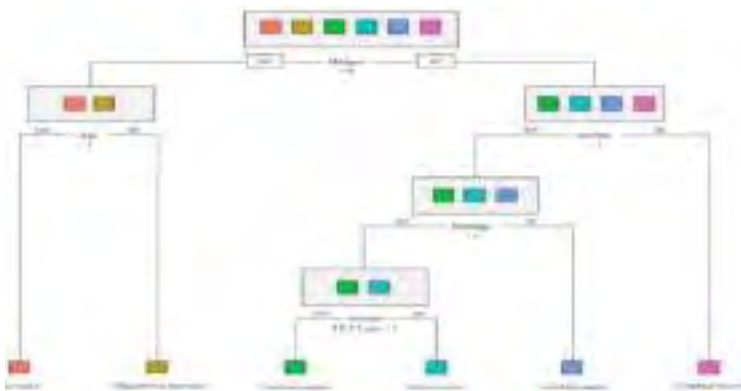
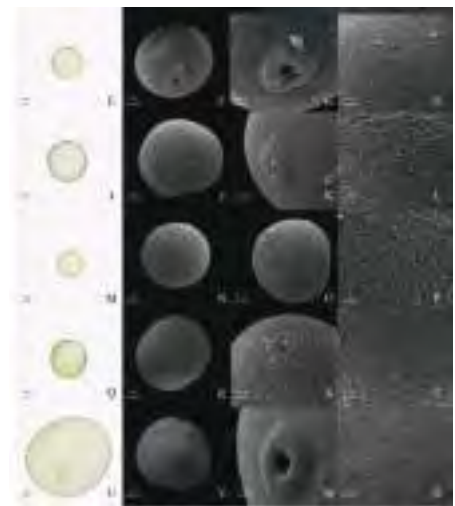


0000-0002-9167-1840



Research fields Plant taxonomy, Palynology, Molecular Systematics, Biodiversity

- Piperaceae in Thailand. *Thunbergia (Acanthaceae)* in Thailand. Pollen allergy in Thailand. Disporopsis in Thailand
- Grass pollen quality control for allergy test kit production using pollen morphological characters.
- Assessment of Morphological, Anatomical and Palynological Variation in the Medicinal Plant *Disporopsis longifolia Craib (Asparagaceae)* for Botanical Quality Control
- Piperaceos plant extracts against parthenogenesis. Qualification control of honey using melliferous plants.







# Assoc. Prof. Chatchai Ngersaengsaruy

Department of Botany

E-mail: fsciccn@ku.ac.th

## Keywords

Clusiaceae, Poaceae (Gramineae), Bignoniaceae, Fabaceae (Papilionoideae), Phaseoleae, Mitragyna (Rubiaceae), Papaver (Papaveraceae), Mangrove Plants, Urban Trees, Cyperaceae

## Research field

- Plant taxonomy
- Plant diversity
- Biodiversity conservation

## Research topics

- A taxonomic revision of the genus *Garcinia* L. (Clusiaceae) in Thailand
- A taxonomic revision of Bignoniaceae in Thailand



14424303900



0000-0002-7131-976X





# Assoc. Prof. Ekaphan Kraichak

Department of Botany

E-mail: ekaphan@ku.th

## Keywords

Bryophytes, Lichens, Phylogenetics, Systematics, Taxonomy, Ecology, Analytics



55355320600



0000-0002-8437-2180



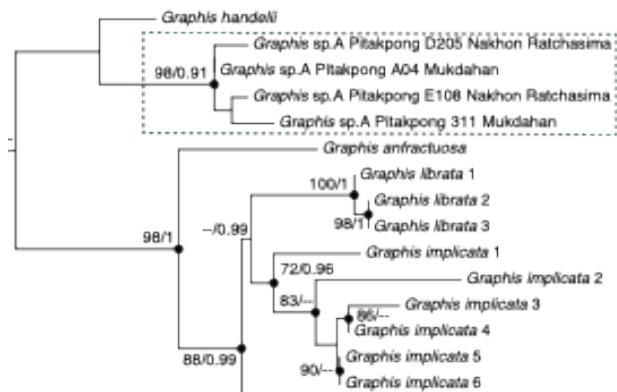
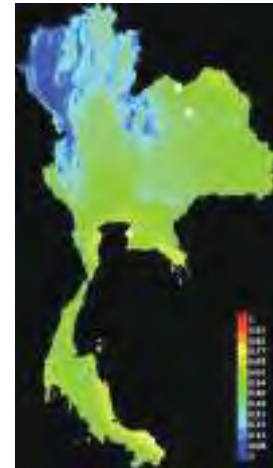
## Research field

Systematics, ecology, evolution of bryophytes and lichens, genetic diversity, data analytics in plant biology and agricultural sciences

## Research topic

Integrative taxonomy of thalloid liverworts and mosses. Animal-Bryophytes Interactions. Genetics diversity of crop plants. Duckweed biology. Species distribution modeling. Yield prediction from satellite images. Epiphytes and forest seedlings ecology.

<https://kraichak.weebly.com>





# Dr. Jaruswan Warakanont

Department of Botany

E-mail: Jaruswan.w@ku.th

## Keywords

*Chlamydomonas reinhardtii*, lipid metabolism, glycerolipids, triacylglycerol, membrane lipids

## Research field

Microalgal Biology, Molecular biology, Lipid Biochemistry

## Research topics

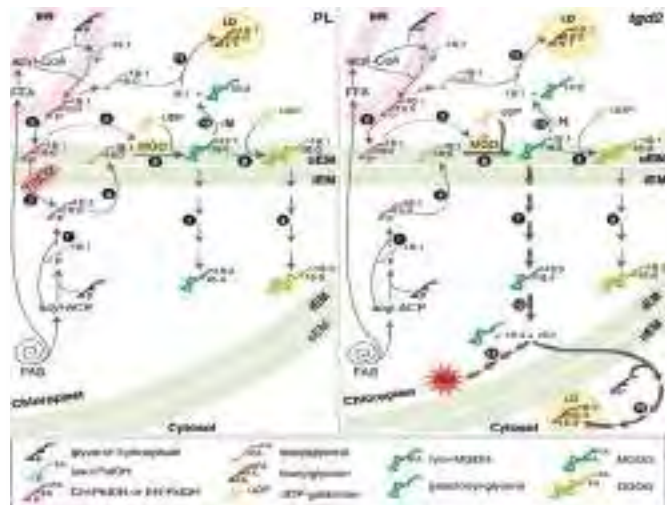
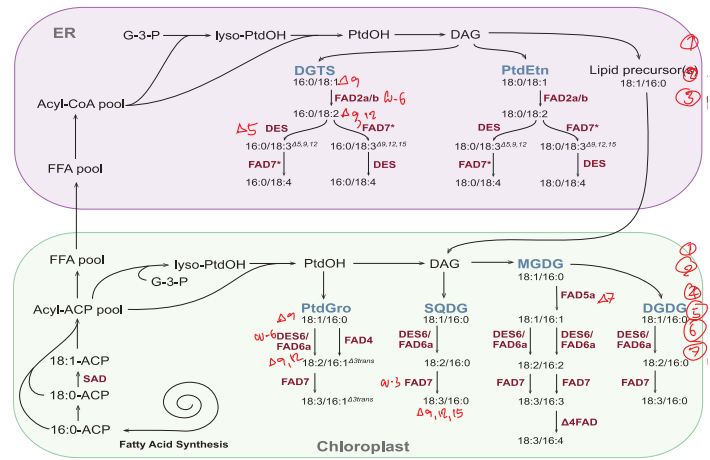
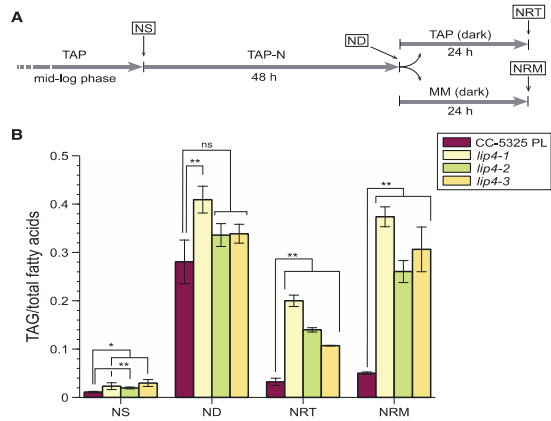
Lipid degradation, Fatty acid synthesis, Fatty acid desaturation



26422702900



0000-0002-1162-4885





# Dr.Minta Chaiprasongsuk

Department of Botany

E-mail: fscimtc@ku.th

## Keywords

Botanical fungicide, Botanical insecticide, Organic paint, Garden balsam, Citrus, Cleome, Coconut black-headed caterpillar

## Research field

Plant secondary metabolism, Plant functional genomics, Plant physiology and evolution, Morphology and physiology of seed

## Research topic

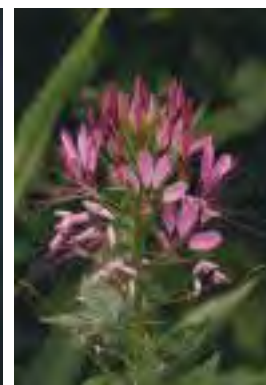
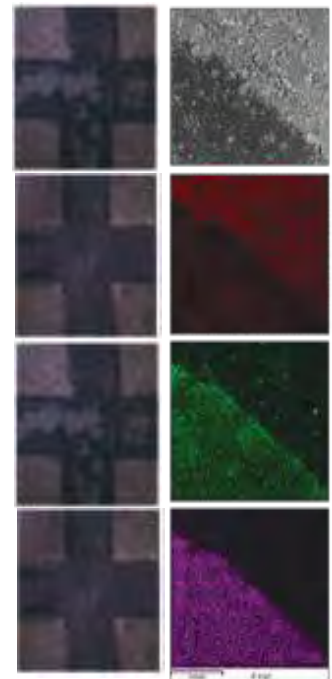
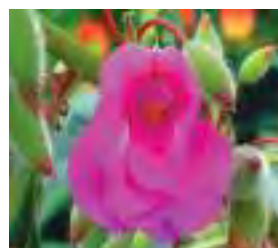
Plant extracts as botanical fungicide effects on rice, Durian and orchid disease, Organic paint analysis, Seed oil contents



16229303400



0009-0006-9146-1161





# Dr. Narong Wongkantrakorn

Department of Botany

E-mail: fscinrw@ku.ac.th

## Keywords

Plant tissue culture, In vitro culture, Stress physiology, NaCl stress, Drought stress

## Research field

Plant tissue culture, Plant Physiology

## Research topic

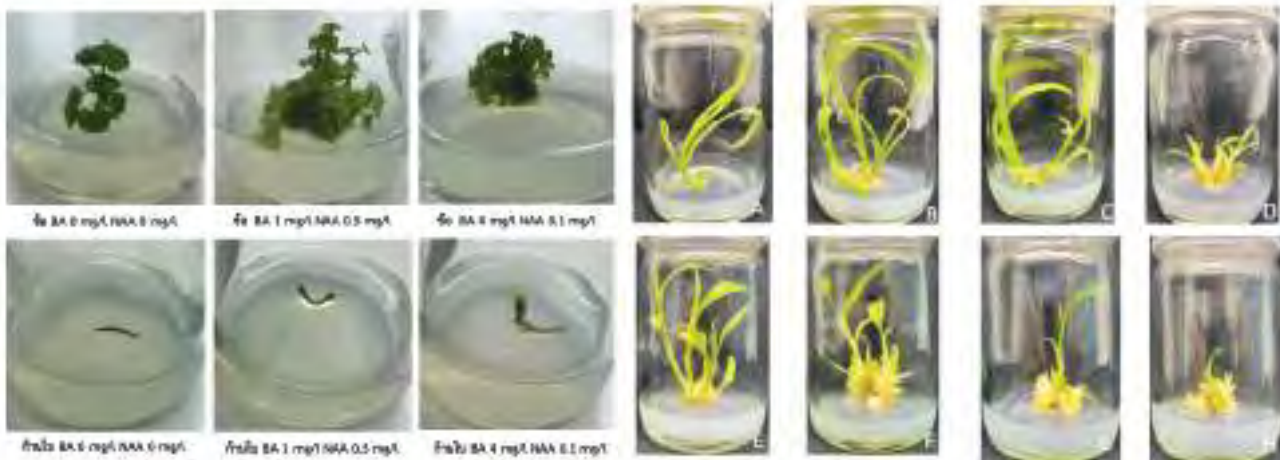
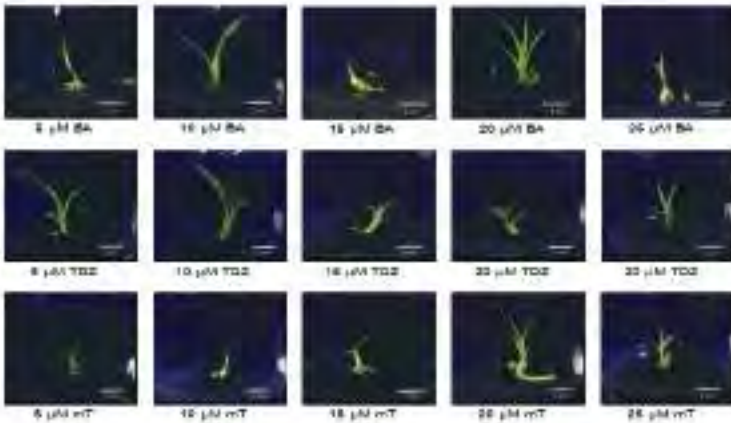
in vitro culture of ornamental plants, medicinal plants, in vitro selection for drought and salt stress tolerance in plants.



34067893200



0000-0003-3148-4960





# Asst. Prof. Nuttha Sanevas

Department of Botany

E-mail: fscintsr@ku.th

## Keywords

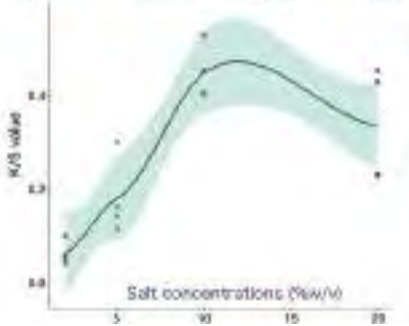
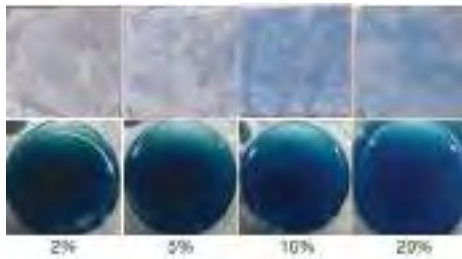
Phytotoxicity, Cyanobacteria, Microalgae, Stonewort, Sphagnopsida



12779568500



0000-0003-2389-9656

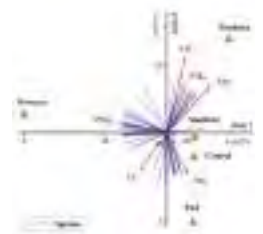
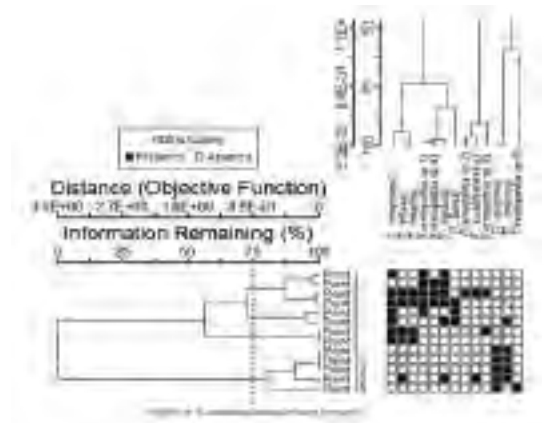
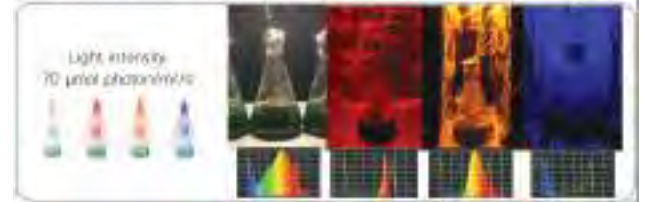


## Research field

Algae Diversity and Ecology, Phytotoxicity and Algae Interactions, Significance and Application of Algae Scopus

## Research topic

Diversity and Ecology of Microalgae and Stonewort, Algae Pigment, Impact of Herbicide on Microalgae





# Asst. Prof. Ornusa Khamsuk

Department of Botany

E-mail: fsciosk@ku.ac.th

## Keywords

Abiotic stress, Growth, Photosynthesis, Biological compound, Herb



56532084400



0000-0001-7827-646X



## Research field

- Plant stress biology
- Plant anatomy
- Plant development

## Research topic

- Biological response mechanisms of drought stress in chili pepper.
- Comparative studies on anatomy and active compounds of Asiatic pennywort under soilless culture systems
- Effects of environmental conditions on garlic clove development.
- Roles of CO<sub>2</sub> on rhizome development and active compounds in black ginger.





# Asst. Prof. Pornsawan Sutthinon

Department of Botany

E-mail: fscipwsu@ku.ac.th

## Keywords

Mangosteen, Ultrastructure, Plant male sterility, Microtechnique, Pollen abortion

## Research field

Plant anatomy, Plant development, Plant Ultrastructure

## Research topic:

Pollen abortion in mangosteen, Precocious pollenkit production in *Garcinia dulcis*, Ultrastructure and anatomy of mycorrhizal root in lady's slipper orchid, Histochemistry and Trichome diversity in some medicinal plants



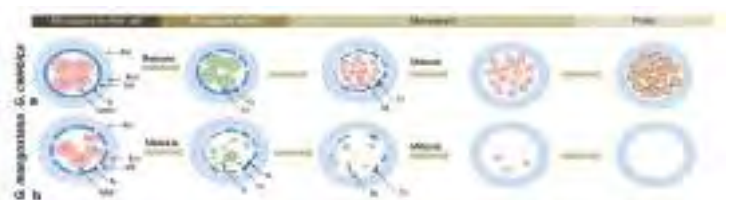
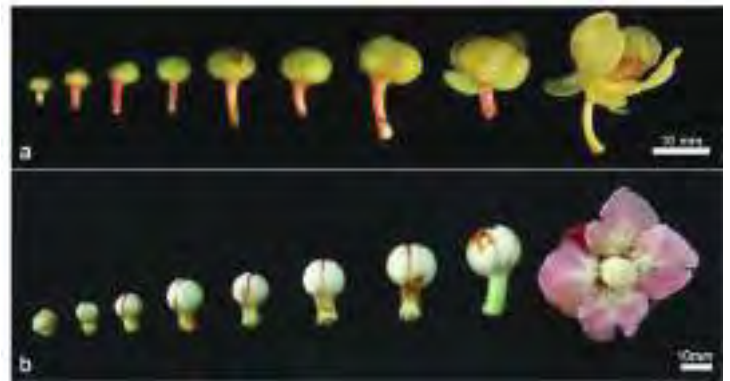
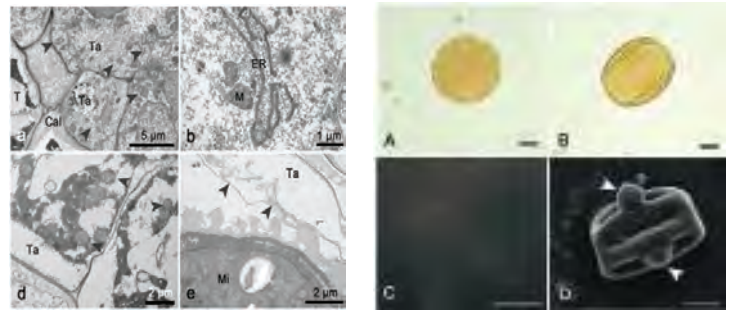
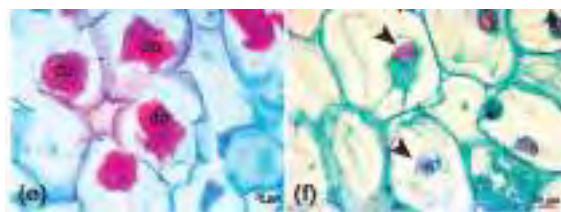
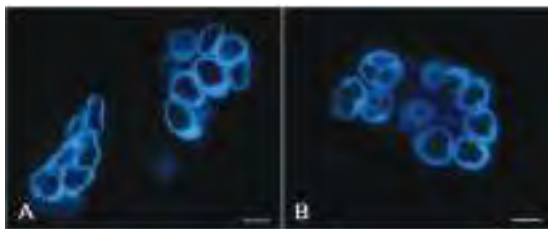
57204159315



0000-0001-6873-9213



PLANT STRUCTURE  
LABORATORY  
KUSUNTHAN







# Asst. Prof. Nutthawat Chuanopparat

Department of Chemistry

E-mail: fscinwc@ku.ac.th

## Keywords

natural products synthesis, anticancer  
antimalarial, antiviral,  
synthetic methodology

## Research field

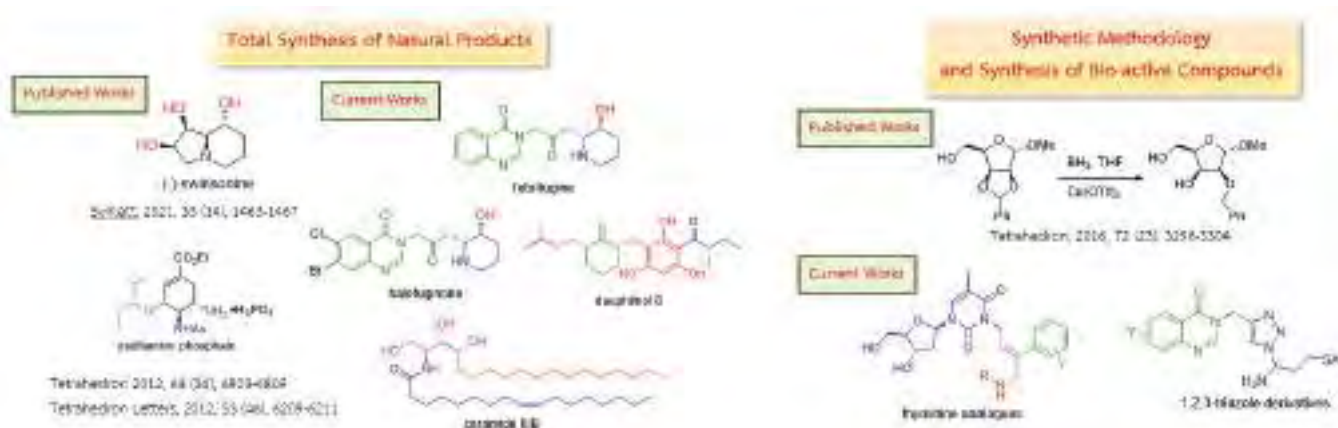
- Natural Products Synthesis (Total Synthesis)
- Bio-active Compound Synthesis
- Synthetic Methodology



55260611200



0000-0002-2187-2647





# Assoc. Prof. Paiboon Ngermmeesri

Department of Chemistry

E-mail: fscipbn@ku.ac.th

## Keywords

Synthetic Methodology, Natural Products  
One-pot Synthesis, Cascade Reaction, Anticancer



55260611200



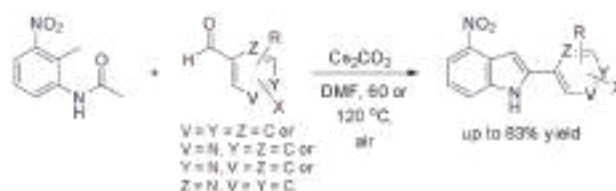
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## Research field

- Natural products synthesis (Total Synthesis)
- Bio-active compound synthesis
- Synthetic methodology

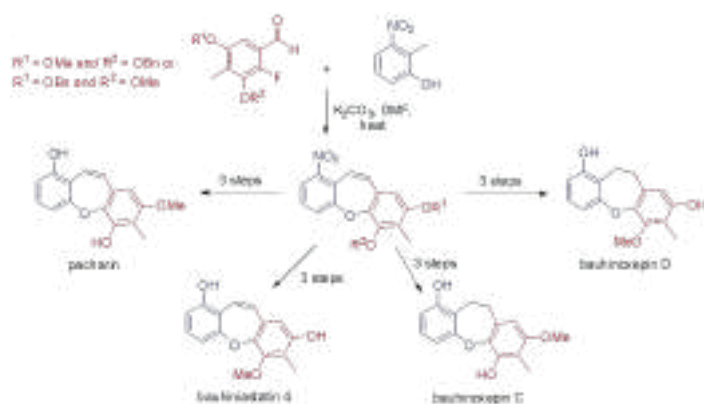
- Total Synthesis of Anticancer Melotenine A



Synthesis 2022, 54, 1850-1856

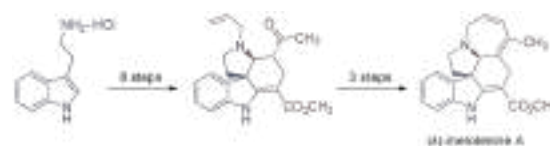
## Research Field: Organic Synthesis

- Total Synthesis of Anticancer Natural Products: Pacharin, Bauhiniastatin 4, Bauhinoxepin C and Bauhinoxepin D



J. Org. Chem. 2021, 86, 1955-1963

- One-pot Synthesis of 2-Arylindole Derivatives under Transition-metal-free Conditions



Synlett 2022, 33, 1443-1447.



# Assoc. Prof. Pakorn WattanaAmorn

Department of Chemistry

E-mail: fscipwa@ku.ac.th

## Keywords

Natural products,  
Synthetic biology and Biological NMR



25648686900



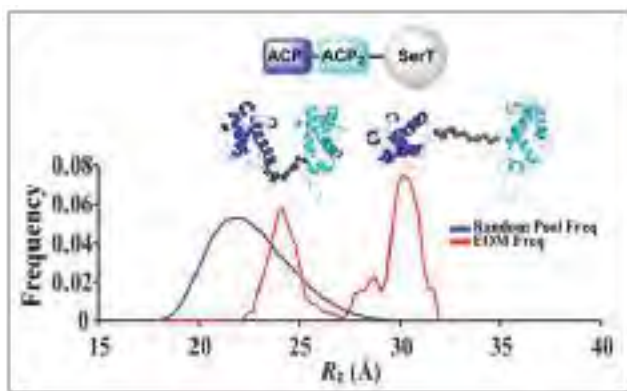
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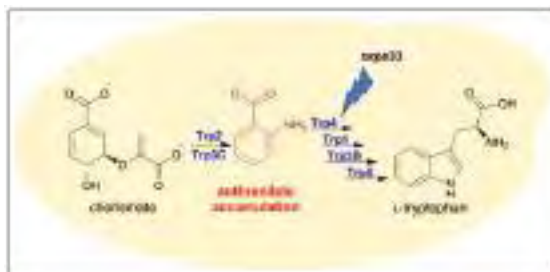
## Research field



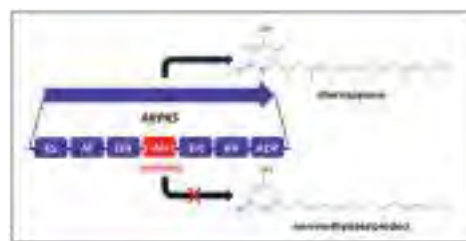
Absolute configuration of azaphilones isolated from *Monascus kaoliang* KB9-fermented rice and solvent effects on their keto and enolforms (Nat. Prod. Res., 2023, 37, 2181-2188)



Solution structure and conformational dynamics of a doublet acyl carrier protein from prodigiosin biosynthesis by SAXS and NMR (Biochemistry, 2021, 60, 219-30)



Anthranilic acid accumulation in *Saccharomyces cerevisiae* induced by an NRPS gene from *Paecilomyces cinnamomeus* (Chembiochem, 2022, 23, e202200573)



Biosynthetic programming of alternapyrone controlled by C-methylation (Org. Biol. Chem., 2022, 20, 5050-4)



# Assoc. Prof. Patchareenart Saparpakorn

Department of Chemistry

E-mail: fscipnks@ku.ac.th, patchreenart.s@ku.th

## Keywords

Nymphoides, Piperaceae, Pollen Allergy,  
Piper extract, Tropical plants, Thunbergia, Viola



8505160900



0000-0001-7980-1473

## 1. Computer-Aided Molecular Design

Protein-Ligand binding interaction

Alzheimer, CVB3 virus, HIV-1, FIV, etc.  
Dengue Virus, COVID-19

MD simulations, Quantum chemical calculations, Virtual Screening, Molecular Docking



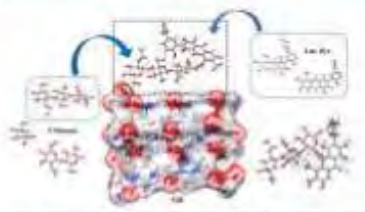
Chem. Biol. Interact. 2021, 344, 109523



Chem. Biol. Interact. 2022, 368, 110227

## 2. Natural product database

Herbs in Thai Traditional Medicine Formulary



J. Mol. Graph. 2021, 106, 107934



Mol. Simul. 2022, 48, 463-476



# Assoc. Prof. Pitak Chuawong

Department of Chemistry

E-mail: fscriptcw@ku.ac.th

## Keywords

Indole, Larock reaction, Anticancer, Transamidation, tRNA synthetase



12788470500



0000-0001-8969-1351



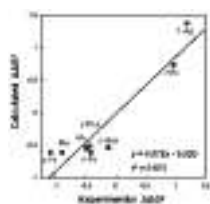
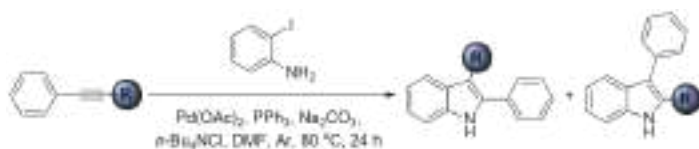
## Research field

Indirect tRNA aminoacylation and antimicrobial drug development

- inhibition of tRNA-dependent transamidase from the human pathogen *Helicobacter pylori*

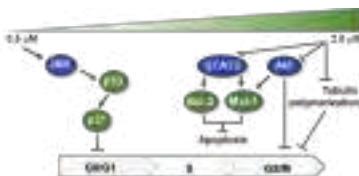
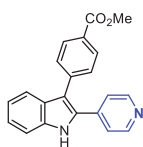
## Larock indole synthesis

- Steric and electronic influences on the regioselectivity

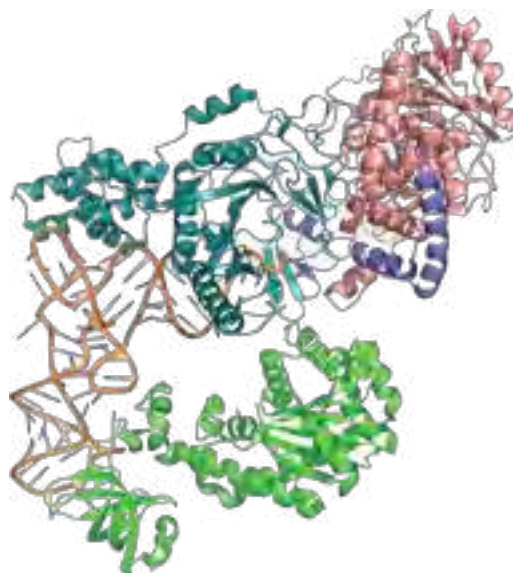


Org. Biol. Chem. 2023, 21, 1501-1513.  
J. Org. Chem. 2022, 87(2), 1218-1229.  
J. Org. Chem., 2013, 78(24), 12703-12709.

- Anticancer activity of indole derivatives and mechanism of action



ChemMedChem 2022, 17(14), e202200127.  
Bioorg. Med. Chem. Lett. 2020, 30, 126777-126783.  
Bioorg. Med. Chem. Lett. 2016, 26, 2119-2123.



Proteins 2020, 88(9), 1133-1142.  
Acta Cryst. F 2017, F73, 62-69.



# Asst. Prof. Sunisa Akkarasamiyo

Department of Chemistry

E-mail: fscisia@ku.ac.th

## Keywords

Synthesis, Monosaccharide,  
Biomass, Pyrrolidine, Deoxygenation



15123902700

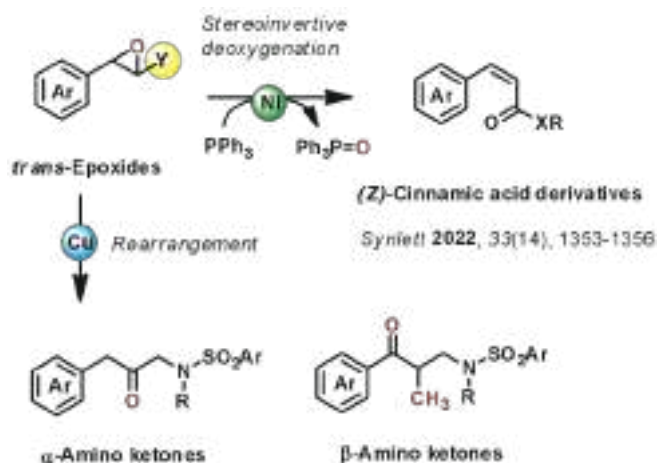


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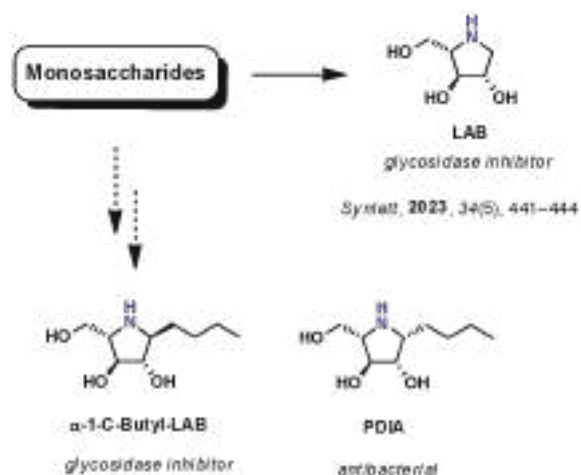


Development of Greener Methodologies for Organic Synthesis

Epoxide Project



Sugar Project





# Dr. Thitaphat Ngernsutivorakul

Department of Chemistry

E-mail: fscithn@ku.ac.th

## Keywords

Analytical chemistry, Sample preparation, SERS, Nanotechnology, Cannabis & Neuroscience Applications



57074189800



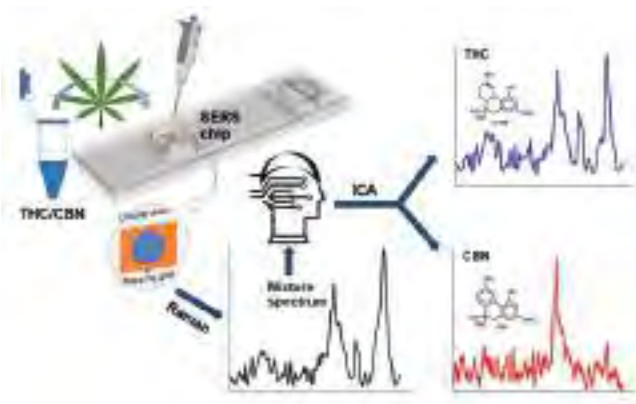
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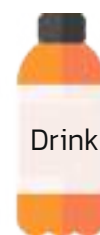
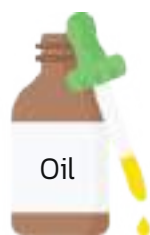
## Research field

- Sample preparation and separation techniques
- Raman and SERS-based sensors for trace analysis of biomolecules
- Microfluidics, nanotechnology, and bioanalytical applications

## Raman-SERS method for cannabinoid analysis



## Miniaturized sample preparation method for analysis of target molecules in complex samples





# Assoc. Prof. Thitinun Karpkird

Department of Chemistry

E-mail: fscitnm@ku.ac.th

## Keywords

Drug delivery, Cyclodextrin, Encapsulation



35086152800



0000-0002-2378-9417



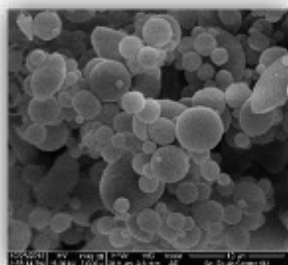
## Research field

Nanoparticle encapsulation for drug and cosmetic applications

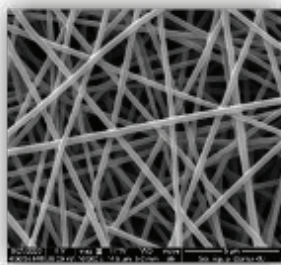
- Design and functional group modification of the encapsulation systems from biocompatible polymers
- Control-release study of drugs or active compounds
- Encapsulation of anti-aging agents, whitening agents, antioxidants

Insect repellent from natural products

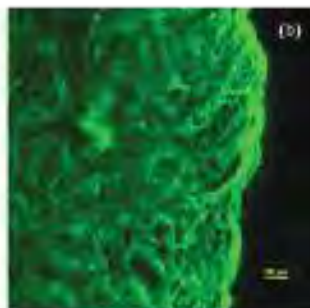
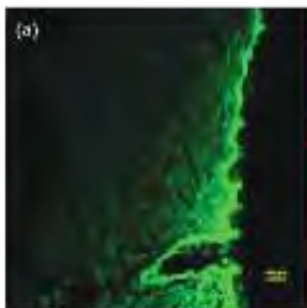
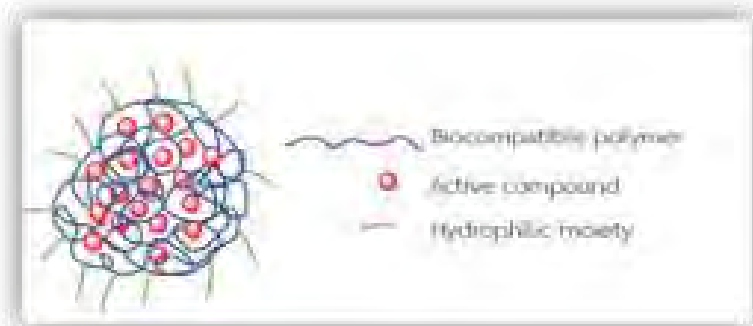
- Development of mosquito repellent formulations



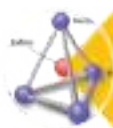
nanoparticles



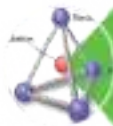
nanofibers



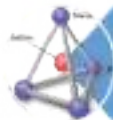
increasing of skin permeation



Increase the stability and solubility



Enhance delivery to target cells increasing the efficiency



Safe and biocompatible





# Assoc. Prof. Wanchai Pluempunupat

Department of Chemistry

E-mail: fsciwcp@ku.ac.th

## Keywords

Drug delivery, Botanical insecticide, Medicinal compound, Drug discovery, Encapsulation



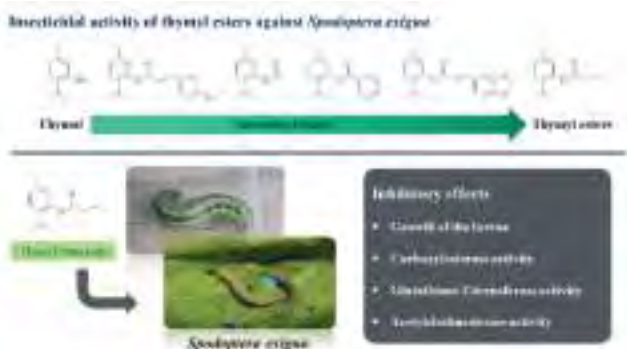
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0000-0001-9332-9830



- Structural modification of bioactive compounds



*Pest Manag. Sci.*, 2022, 78, 684-691



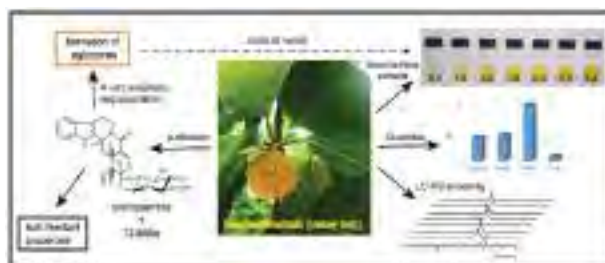
*Pest Manag. Sci.*, 2020, 76, 928-935



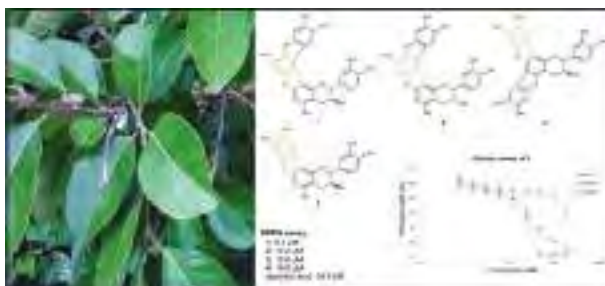
*ChemistrySelect*, 2023, 8(46), e202303879

## Research field

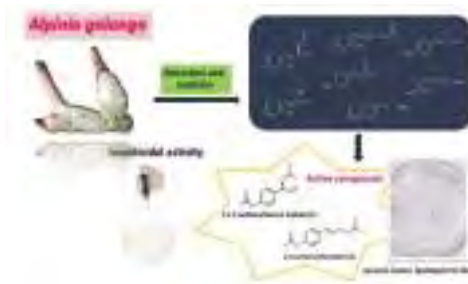
- Searching for new botanical insecticides & medicines



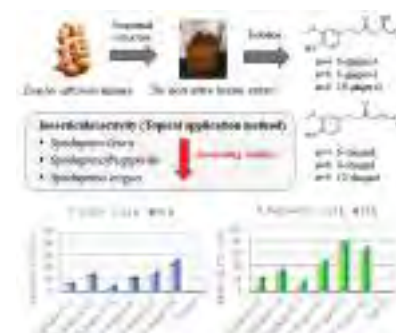
*Molecules*, 2022, 27, 5176



*Molecules*, 2021, 26, 1078



*Nat. Prod. Res.*, 2023, 37, 669-674



*Nat. Prod. Res.*, 2021, 35, 5261-5265



# Asst. Prof. Chatuporn Kuleung

Department of Genetics

E-mail: fscictp@ku.ac.th

## Keywords

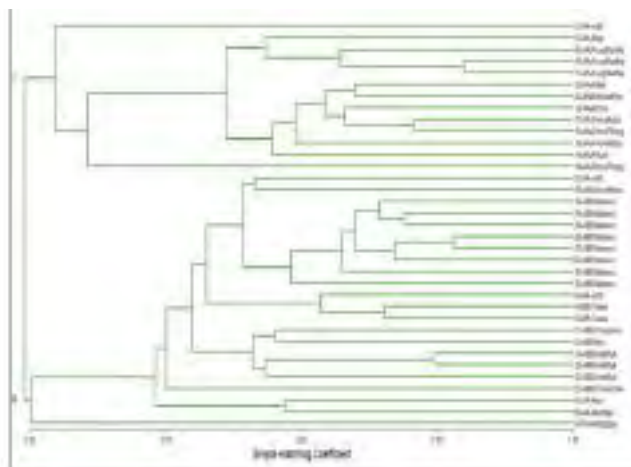
Plant molecular Genetics,  
Genetic diversity, DNA marker



6504462107



0000-0001-5107-3558





# Assoc. Prof. Kornson Srikulnath

Department of Genetics

E-mail: fscikss@ku.ac.th

## Keywords

Bioresource, Conservation, Food Security, Genome Informatics, Comparative Genomics



35111844700



0000-0002-5985-7258

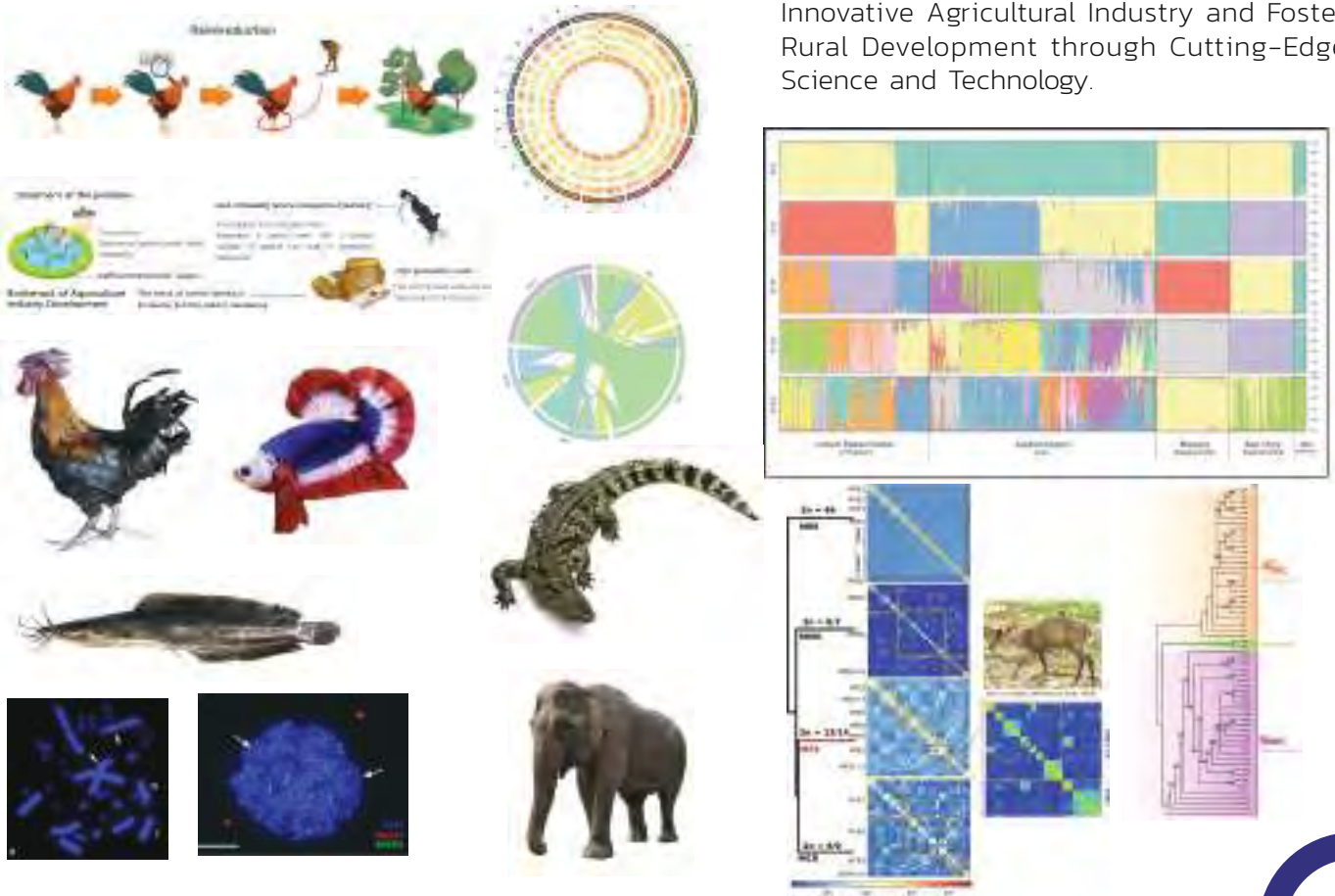


## Research field

Sustainable Food Security, Agrobiodiversity and Conservation

Nurturing Sustainability, Indigenous Genetic Resources for Food Security, Zero Hunger, and Agrobiodiversity Conservation

- Cultivating a Resilient Future: Leveraging Animal Genetic Resources for Smart Agriculture and Sustainable Food Production.
- Powering Supply Chains: Enhancing Indigenous Genetic Resources for High-Value Species like Chickens and Catfish, Tailored for Thriving in Tropical Climates and Heat Stress Conditions.
- Igniting S-Curve Agricultural Growth: Utilizing Indigenous Bioresources to Drive Innovative Agricultural Industry and Foster Rural Development through Cutting-Edge Science and Technology.





# Asst. Prof. Mingkwan Nipitwattanaphon

Department of Genetics

E-mail: fscimkn@ku.ac.th

## Keywords

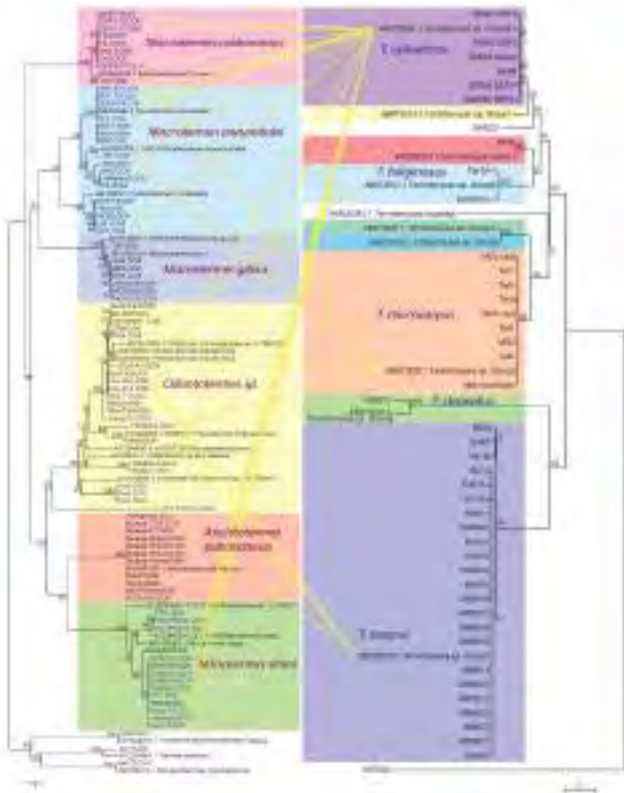
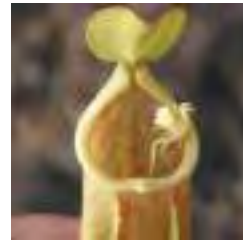
Co-evolution, Molecular ecology, Population genetics, Insects, Microbiome



37097898300



0000-0003-0730-2354





# Assoc. Prof. Passorn Wonnapijit

Department of Genetics

E-mail: fscipswa@ku.ac.th

## Keywords

Genetics, Bioinformatics, Evolution, Genome, Gene identification, Biosynthesis



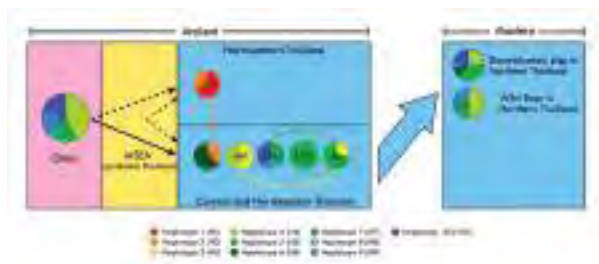
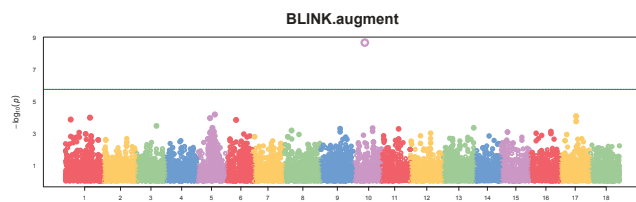
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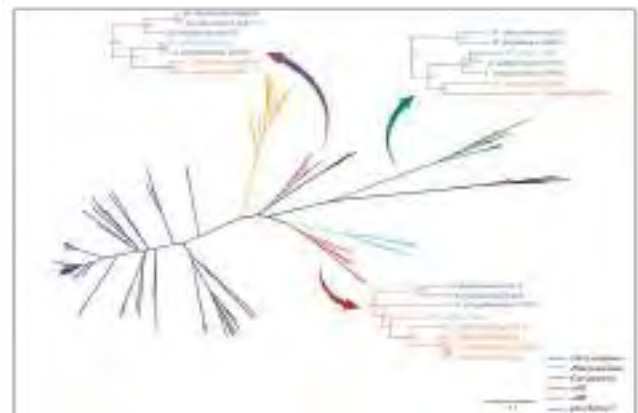
0000-0002-6224-0275

## Research field

- Genome analysis for identifying genes associated with secondary metabolite biosynthesis in dictyostelids, fungi and plants
- Genome analysis for cassava breeding
- Human and animal ancient DNA analysis
- Bacterial diversity on plastisphere



Chittavichai, T, et al. (2021). "Origin and distribution of ancient Thai pig lineages" International Journal of Osteoarchaeology.





# Asst. Prof. Peerapat Roongsattham

Department of Genetics

E-mail: Peerapat.ro@ku.ac.th

## Keywords

Stress response, Plant growth-promoting bacteria, PGPB, Omics, Cell biology, Duckweed



15060700700

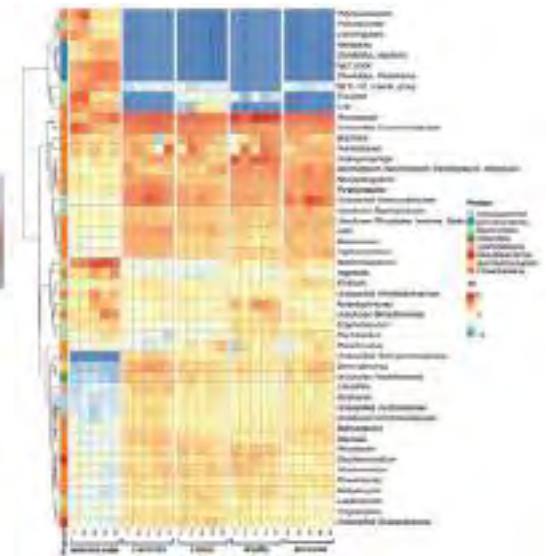
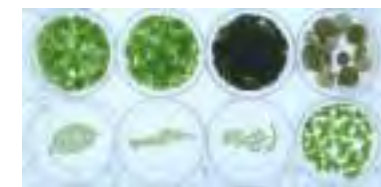
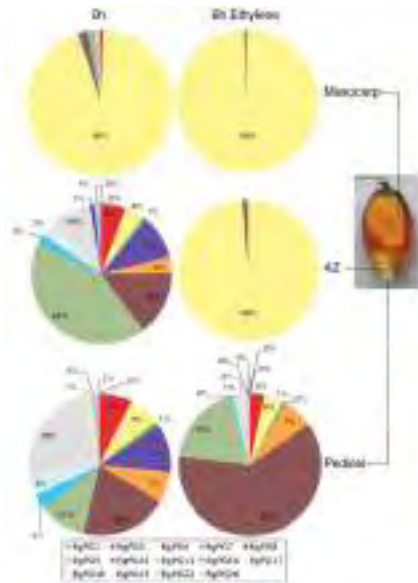
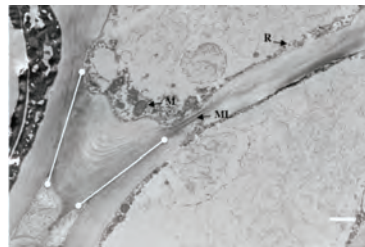
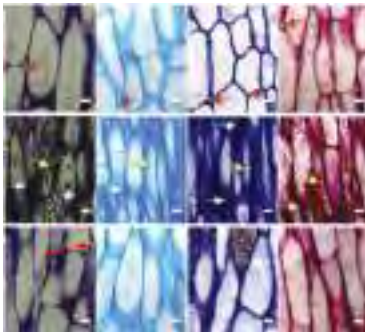


0009-0008-4697-9855



## Research field

I am currently working on duckweed. The areas of focus are plant growth-promoting bacteria to enhance duckweed growth and the stress response of duckweeds to pollutants such as heavy metals. I use multiple tools, including histochemistry, plant physiology, and omics, to elucidate the mechanisms and relationships.





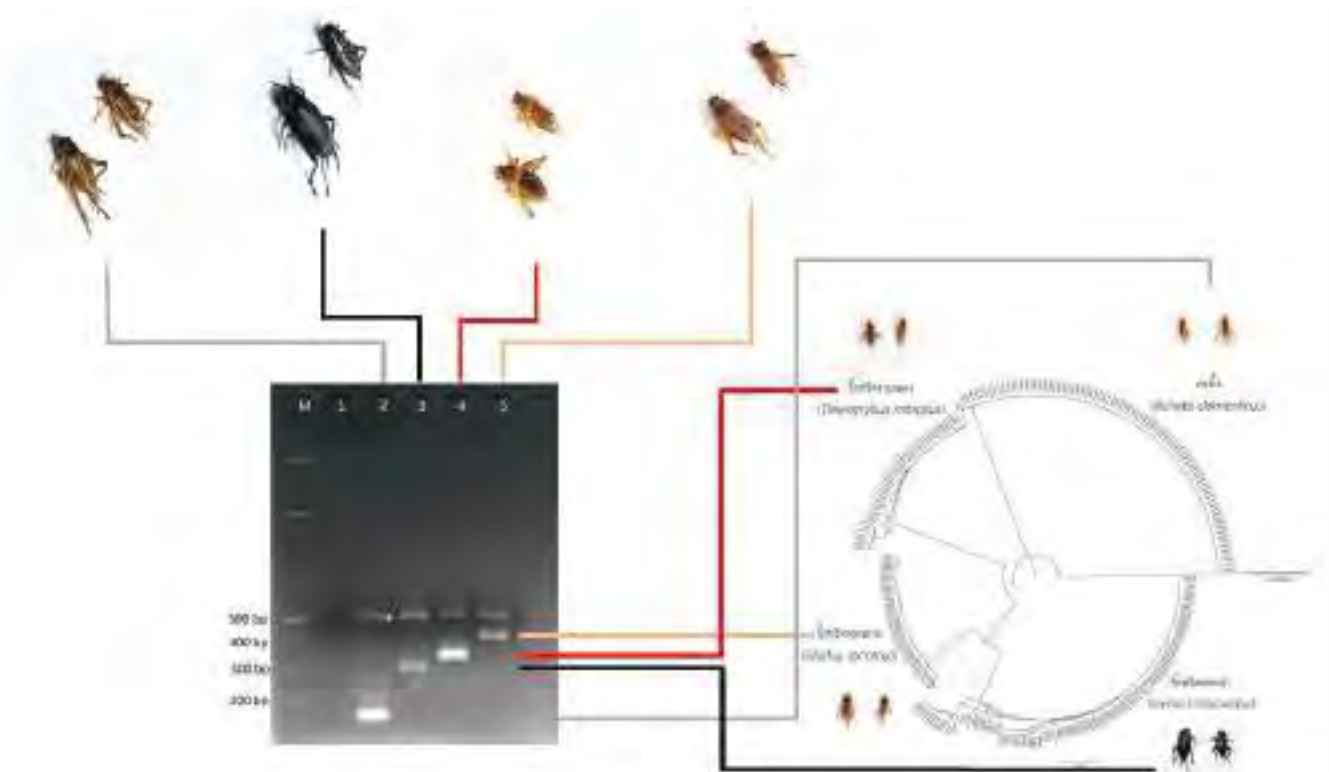
# Asst. Prof. Pradit Sangthong

Department of Genetics

E-mail: fscipds@ku.ac.th

## Keywords

Edible insects, Species-specific marker,  
Population genetics, Phylogenetic inference





# Asst. Prof. Teerasak E-kobon

Department of Genetics

E-mail: fscitse@ku.ac.th

## Keywords

Bioinformatics, Computational Biology, Omics of Animal and Human Infectious Diseases, Gastropod Mucus Application

## Research Focus

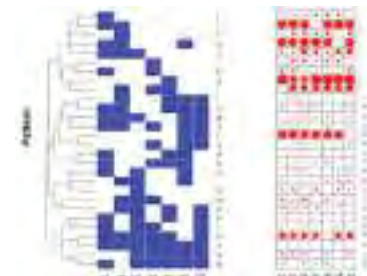
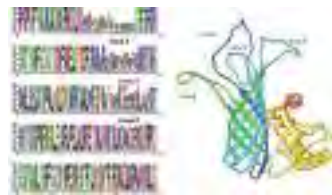
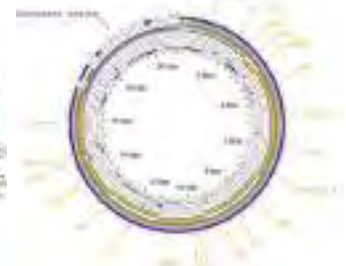
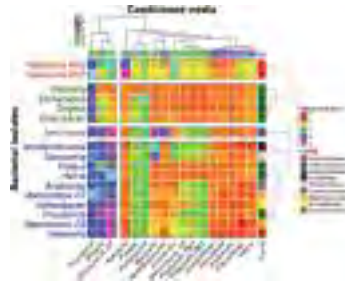
- Development of tools and workflows for Omics data analysis
- Utilization of microbial Omics data for disease monitoring and treatment
- Gastropod functional genomic exploration for commercial application



56692918900



0000-0002-3919-9841







# Assoc. Prof. Wunrada Surat

Department of Genetics

E-mail: fsciwrds@ku.ac.th

## Keywords

Ancient DNA, Domestication, Zooarchaeology, Microbiome



24451044400



0000-0003-2323-0696

## Research field

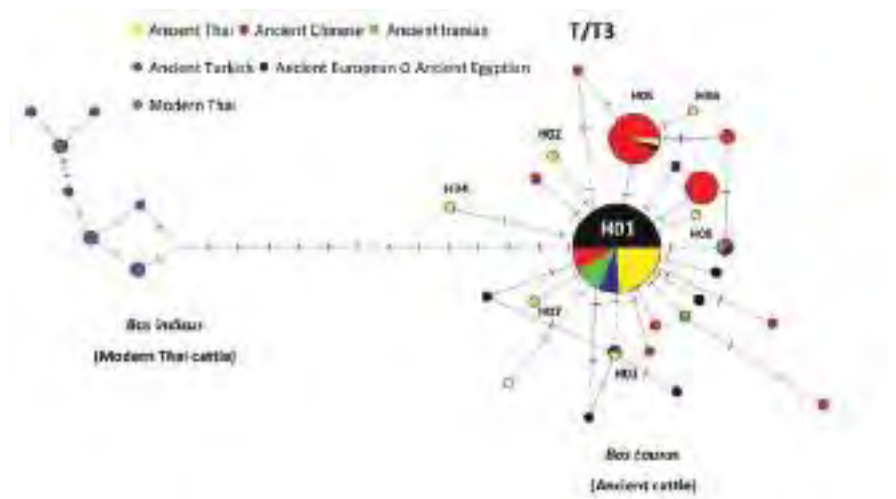
Ancient DNA analysis of domestic animals and microbiome.

Objectives:

- To find out the origin of animal domestication in Thailand
- To examine pathogens in the ancient specimens.



Sample preparation



Species identification and haplotype analysis



Analysis of Microbiome from an ancient specimen



# Asst. Prof. Akkaraphol Srichaisupakit

Department of Microbiology

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## Keywords

Bacteriophage biology, Biotechnology, Microbial glycobiology, Bioresource



55571468600



0000-0003-2124-5253

## Research field

- Novel Phage isolation, diversity and applications (combating drug resistant pathogen, disruption of biofilms)
- Beneficial microbes from Thai fermented foods
- Recombinant pathways
- Microbial glycan engineering, analysis and profiling

Diversity of phages



Phage removal of biofilm



Metabolites from beneficial bacteria affecting drug resistant *P. aeruginosa*



# Asst. Prof. Chetsada Pothiratana

Department of Microbiology

E-mail: fscicsd@ku.ac.th

## Keywords

Hydrophobin, Filamentous fungi and Mushrooms, Mycelium-based materials Corn smut fungi (*Ustilago maydis*), Glycolipid



14521611100



0009-0003-6959-4660



## Research field

- Hydrophobins from mushrooms and filamentous fungi and their applications : Use of hydrophobin for medical, food and biotechnology application
- Production of mycelium-based materials : Bricks and leather-like materials from mycelia
- Study of corn smut fungi (*Ustilagomaydis*) in Thailand for biotechnological application

## Mycelium-based materials

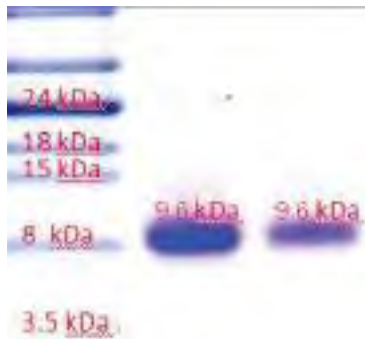


Mycelium brick

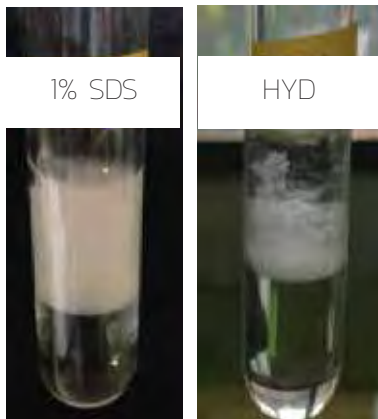


Mycelium leather

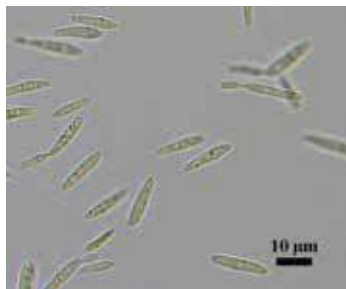
## Amphipathic protein hydrophobin



## Hydrophobin (HYD)



## Study of corn smut fungi



*Ustilago maydis*



Smut Disease



Glycolipids visible as needle-like precipitates



Teliospore Germination



# Asst. Prof. Duenrut Chonudomkul

Department of Microbiology

E-mail: fscidrc@ku.ac.th

## Keywords

Polyunsaturated fatty acid, Carotenoid, Anti-nutritional factors, Bacillus, Microalgae biotechnology



6504759849



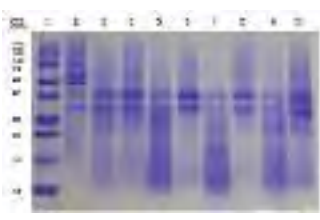
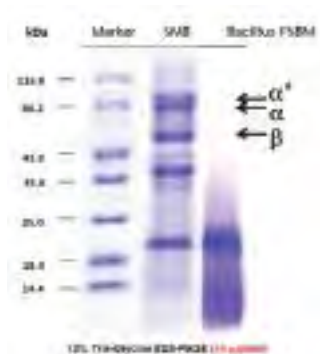
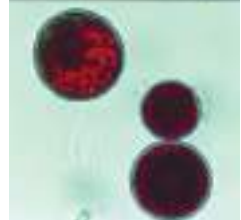
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## Research field

Collection of microalgae strains and study of microalgae production and utilization

- High value polyunsaturated fatty acid production i.e. DHA, AA or ARA
  - Carotenoid pigment production i.e. astaxanthin
  - Microalgae as a feedstock for biodiesel production
- Bacterial strains for agricultural applications
- Nutritional quality improvement of fermented soybean meal by Bacillus i.e. improvement of protein quality, reduction of anti-nutritional factors, phytic acid
  - Carotenoids production by Bacillus
  - Utilization of bacterial enzymes for biodegradation



Enzyme protease



Fermented soybean meal



# Assoc. Prof. Gunjana Theeragool

Department of Microbiology

E-mail: gunjana.t@ku.ac.th

## Keywords

Thermotolerant acetic acid bacteria, Adaptation, Vinegar, Bacterial cellulose



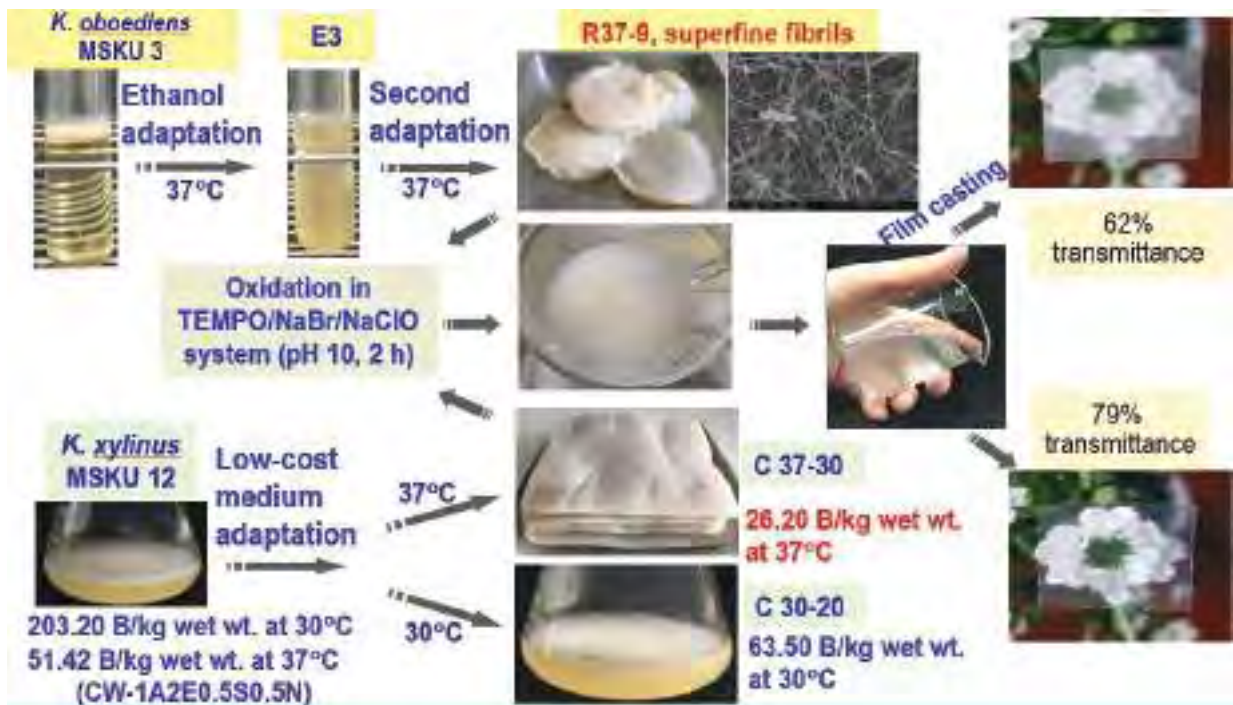
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0000-0003-3723-3118



## Research field





# Asst. Prof. Noppon Lertwattanasakul

Department of Microbiology

E-mail: fscinple@ku.ac.th

## Keywords

Bioethanol, Thermotolerant yeasts, Yeast Biotechnology



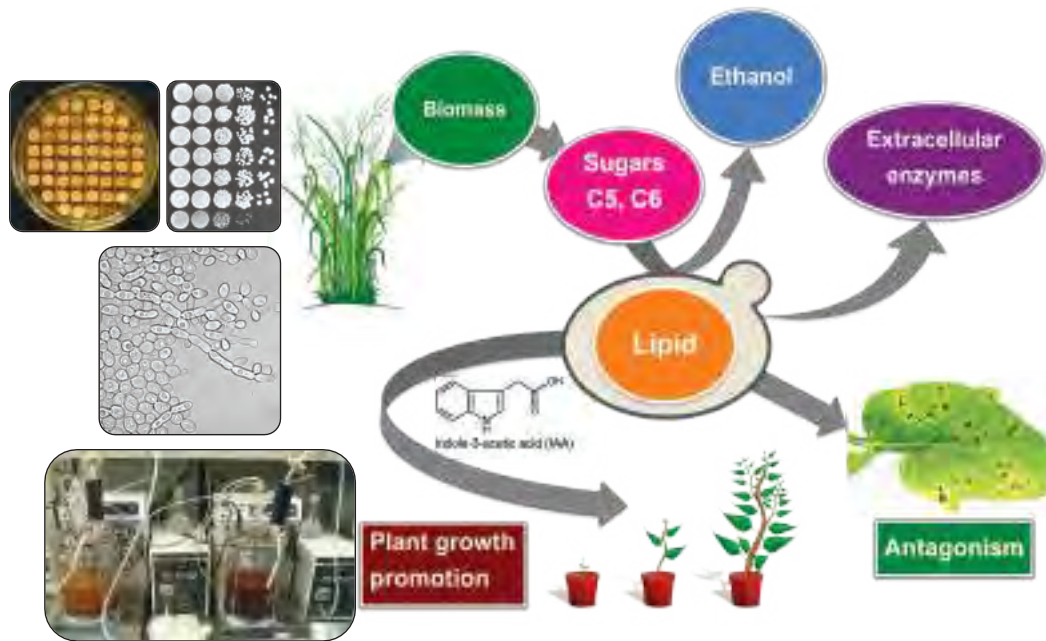
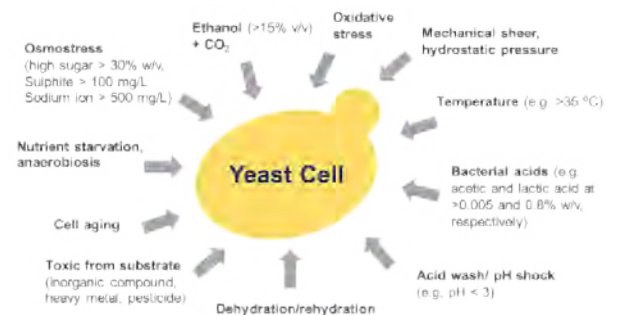
16744019100



0000-0003-3590-7545



## Yeast Physiology & Biotechnology





# Asst. Prof. Pannida Khunnamwong

Department of Microbiology

E-mail: pannida.kh@ku.th

## Keywords

Yeast Taxonomy, Yeast Diversity, Biological Control, Yeast biotechnology



56357967300



0000-0001-7536-929X

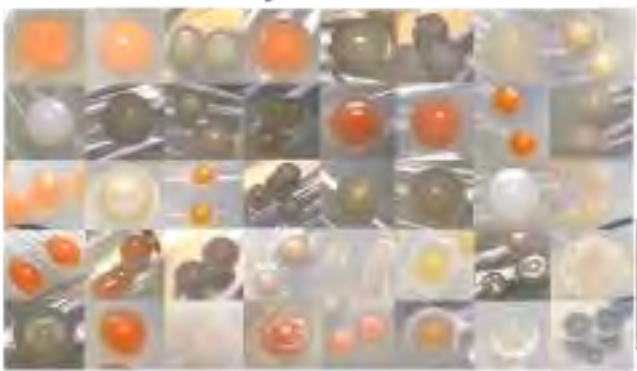


## Yeast Taxonomy and Diversity

### Discovering of new taxa in Thailand



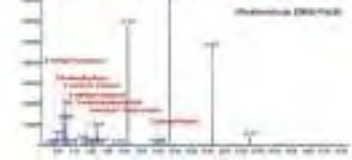
### Yeast diversity in natural habitats



### Sugar alcohol-producing yeasts Carotenoid-producing yeasts



### Volatile compound-producing yeasts



## Yeast in Food and Agricultural Sciences

### Biological control by yeasts



## Bioplastic-degrading Yeasts

Degradation activity on PBS medium

Antagonistic activity of yeasts against plant pathogenic fungi :

- *Rhizoctonia solani* (sheath blight disease)
- *Curvularia lunata* (dirty panicle disease)
- *Fusarium moniliforme* (bakanae disease)
- *Sclerotium rolfsii* (stem and fruit disease)





# Asst. Prof. Pinsurang Deevong

Department of Microbiology

E-mail: fsciprd@ku.ac.th

## Keywords

Gut bacteria, Microbiome, Probiotic, Biodegradation



12142981700



0000-0003-1372-1619

## Research field

- Isolation and utilization of valuable bacteria from insects, worms, animals and environments
- Culture-dependent and culture-independent studies of hydrolytic bacteria

- Animal feed ➤ Antimicrobial agent ➤ Probiotic
- Biocontrol (against fungi, insects, nematode, etc.)
- Bacterial metabolites ➤ Bacterial remediation
- Non-starch polysaccharide biodegradation
- Chitinolytic bacteria and chitinase
- Lignin biodegradation
- Molecular and clonal analysis

### Chitinolytic Bacteria and Chitinase

➤ Application : biocontrol

➤ Gene cloning and protein characterization

Pathogenic fungi degradation & Analysis of hydrolyzates

Chitinase protein structure

### Potential Probiotic

*Bacillus* sp.      Lactic acid bacteria

Hemolysis      Antioxidant      Cell adhesion

### Animal Feed Enzymes

Phytase      Amylase      Cellulase      Lipase

### Insect Gut Microbiome





# Dr. Piyangkun Lueangjaroenkit

Department of Microbiology

E-mail: piyangkun.lu@ku.th

## Keywords

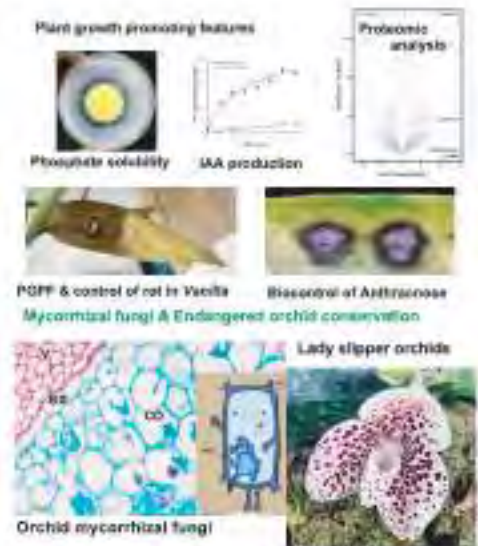
Mycology, Fungi, Mushroom, Fungal diversity, Fungal taxonomy, Fungal biotechnology



57207203551



0000-0002-1362-2971



## Fungal Biotechnology in Agricultural and Environmental Applications

### Fungal Bioremediation

*Trametes polyzona*

0 1 1.5 h

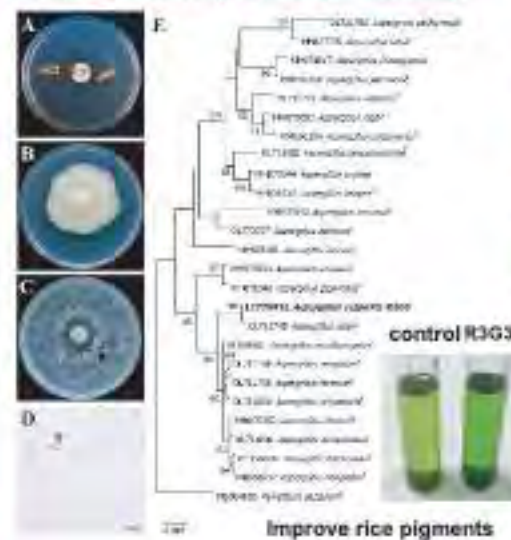
Ligninolytic enzymes Evaluation of toxicity

Toxic aromatic compound bioremediation

Novel fungi from Amphipod gut

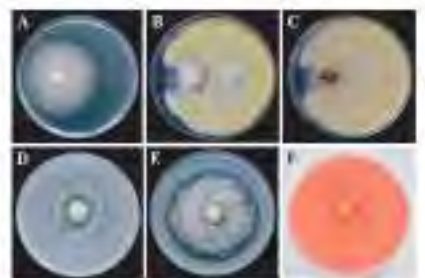
### Fungi in Agricultural Sciences

#### Fungal taxonomy & Fungal diversity



Plant growth promoting fungi (PGPF) using as biocontrol agents against plant pathogenic microorganisms

#### Role of cell wall degrading enzymes against fungal plant pathogens





# Dr. Rachatida Detudom

Department of Microbiology

E-mail: ratchaida.d@ku.ac.th

## Keywords

Fermented food, Food biotechnology, Probiotic, Functional & Novel food



57208721934

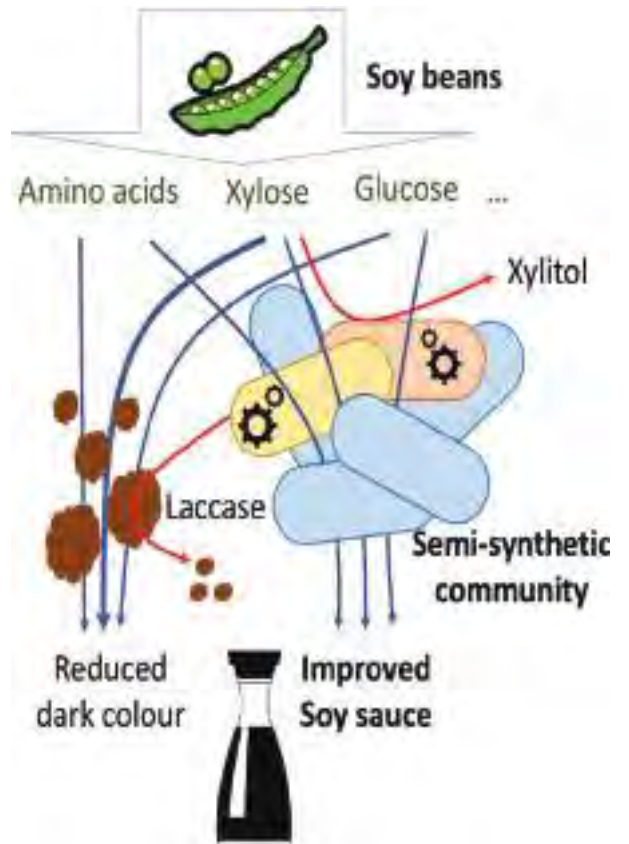
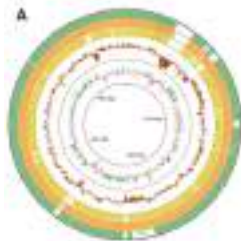


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## Research field

- Screening and characterization of autochthonous microorganisms from traditional fermented food
- Safety evaluation of potential starter and probiotic cultures for commercialization in food application using in-silico approach
- In search of novel functional fermented food with key features for healthy aging





# Assoc. Prof. Wanwisa Sudprasert

Department of Applied Radiation and Isotopes

E-mail: fsciwasu@ku.ac.th

## Keywords

Radiation Biodosimetry, Nuclear Technology, Environmental Monitoring



15021341800



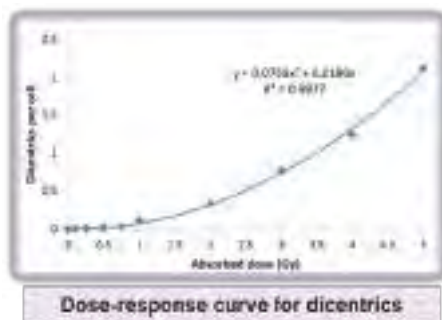
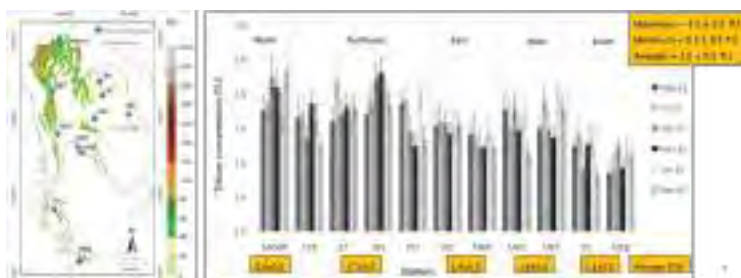
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## Research field

Nuclear and Isotopic Techniques, Radiation Biodosimetry, Radiation Dose Assessment

- Measurement of tritium level in environmental and tap water resources for the establishment of national water radioactivity database
- Source identification of PM2.5 in Bangkok and the metropolitan region by ion beam analysis
- Development of microfluidic system for high-throughput radiation dose assessment
- Constructing dose-response curves to support radiological emergency preparedness in Thailand



Microfluidic disc for lymphocyte separation



# Assoc. Prof. Anchalee Aowphol

Department of Zoology

E-mail: fsciac@ku.ac.th

## Keywords

Amphibian, Reptile, Systematics, Taxonomy, Ecology

## Research field

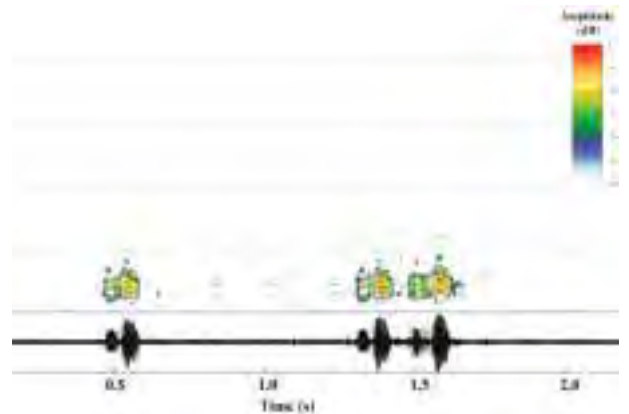
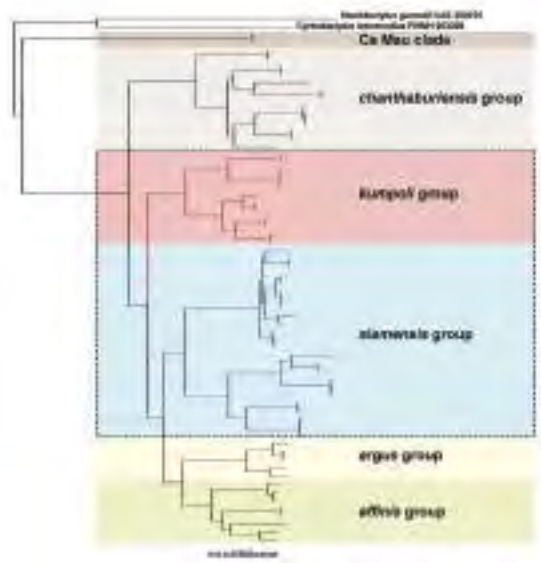
Systematics and Ecology of Amphibians and Reptiles in Southeast Asia



15123897000



0000-0001-9504-4601





# Asst. Prof. Attapol Rujirawan

Department of Zoology

E-mail: fsciapr@ku.ac.th

## Keywords

Amphibians, Reptiles, Morphology, Molecular phylogeny, Bioacoustics

## Research field

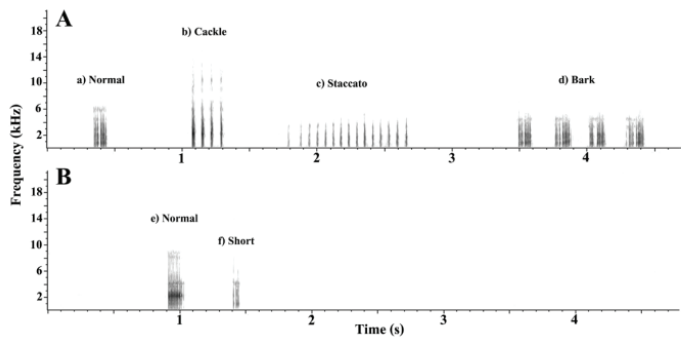
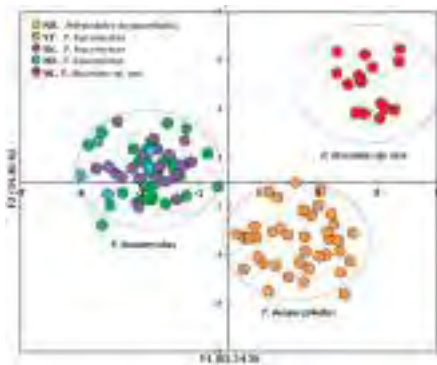
Taxonomy and Systematics of Amphibians and Reptiles in Southeast Asia



55840934900



0000-0001-9179-6910





# Prof. Boonsatien Boonsoong

Department of Zoology

E-mail: fscibtb@ku.ac.th

## Keywords

Biodiversity, Taxonomy, Systematics, Ephemeroptera, Odonata, Aquatic insects, Rapid bioassessment, Freshwater benthic Macroinvertebrate and Science communication



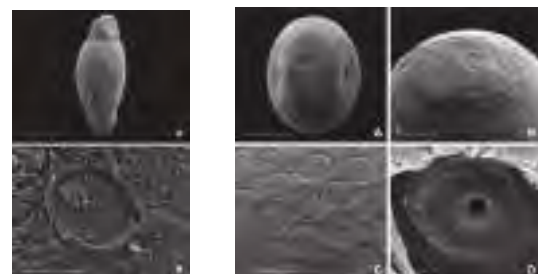
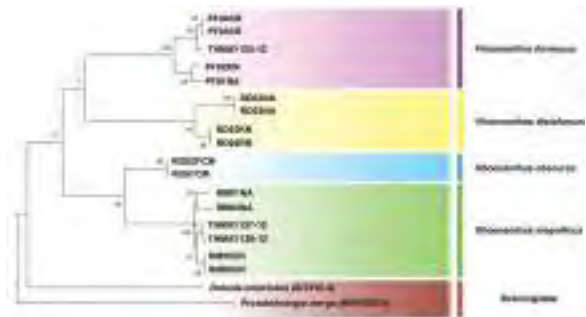
24464900300



0000-0002-8166-0021



## Research field





# Assoc. Prof. Cheewarat Printrakoon

Department of Zoology

E-mail: fscicrp@ku.ac.th

## Keywords

Marine, Freshwater and estuarine mollusk mollusk, Brachiopods, Ecological studies, Morphometric, Taxonomy, Mangrove ecology and management



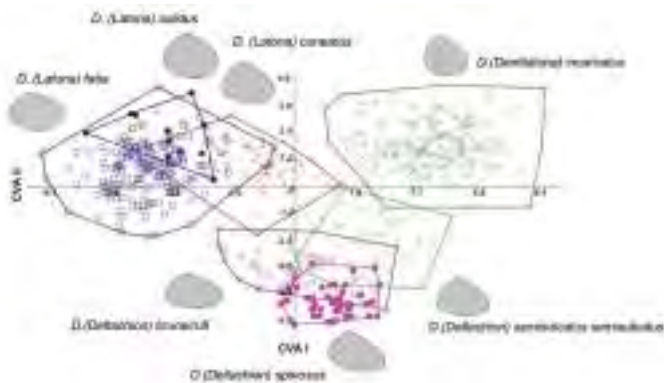
36701963900



0000- 0002-1032- 3853



## Research field





# Asst. Prof. Koraon Wongkamhaeng

Department of Zoology

E-mail: fscikaw@ku.ac.th

## Keywords

Amphipod, copepod, Marine, Mangrove, Estuaries, Microplastic, Food webs



35222667100



0000-0001-7671-8869



## Research field

My research focus on coastal biodiversity and microplastic contamination along the food web. We have been working on gammarid amphipods, and 20 new species and two new genera were found in Thailand and Indonesia. The amphipods are a good candidate bioindicator for many coastal ecosystems. This year, we've found tube building amphipods that can create amphipod silk and potentially develop into underwater glue or medical utilization.







# Assoc. Prof. Nopparat Srakaew

Department of Zoology

E-mail: fscinrsr@ku.ac.th

## Keywords

Aquatic toxicology, Biomonitoring, Biomarker, Microanatomy, Reproductive endocrinology



36663028100

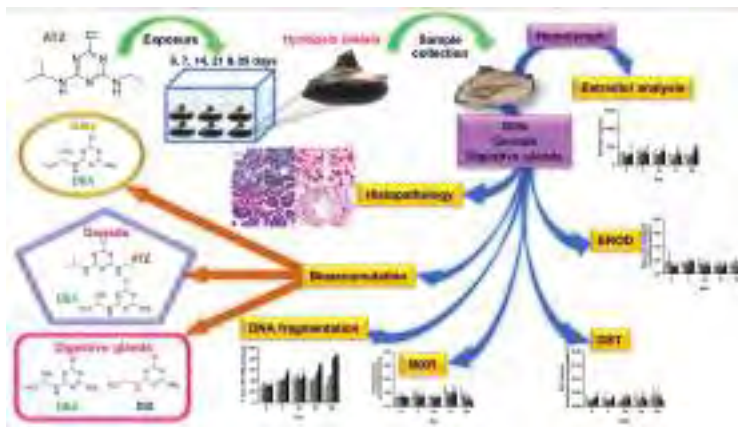


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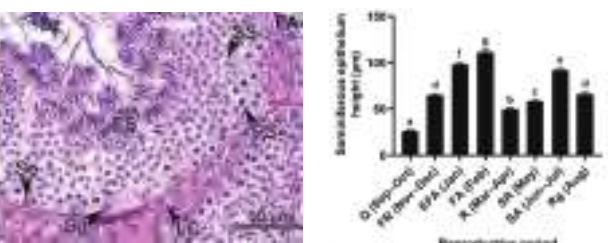
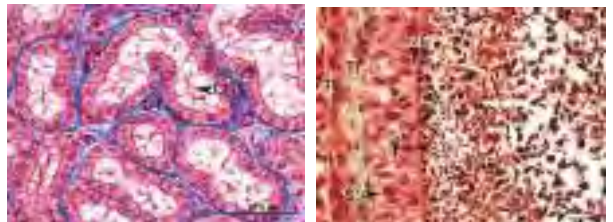
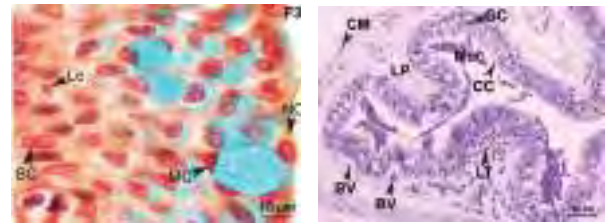


## Research field

- Utilization of biochemical and cellular components from aquatic biota as biomarkers for biomonitoring of aquatic environments
- Microscopic anatomy, histochemistry, and reproductive endocrinology of vertebrates



Aquatic toxicology



Microanatomy, Histochemistry, and Reproductive Endocrinology



# Prof. Panas Tumkiratiwong

Department of Zoology

E-mail: fscipnt@ku.ac.th

## Keywords

Amphibian, Reptilian and avian reproduction and endocrinology



6503849955

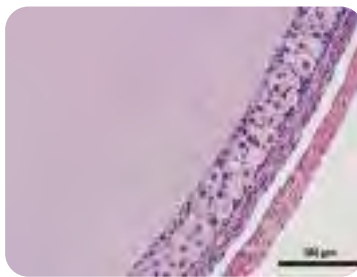
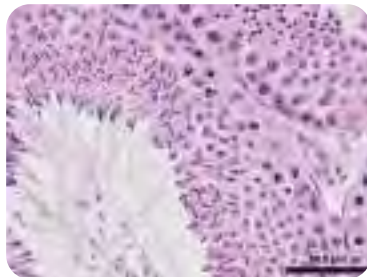
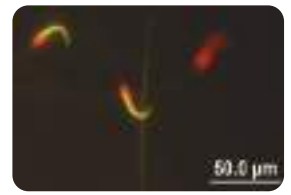


0000-0002-9699-1536



## Research field

- Reproductive endocrinology on Natural amphibian, reptilian; and nearly extinct captive-raised Avian with monitoring an annual profile of reproductive behaviors and fecal sex steroid hormones under the conservation strategy of such near species.
- Mechanisms underlying male temporal, reversible anti-fertility of plant extracts exerting anti-androgenic actions.





# Asst. Prof. Patchara Danaisawadi

Department of Zoology

E-mail: fscipad@ku.ac.th

## Keywords

Amphibians diversity, Tadpole, Ethogram, Snail-eating snake, Flat-headed cat

## Research field

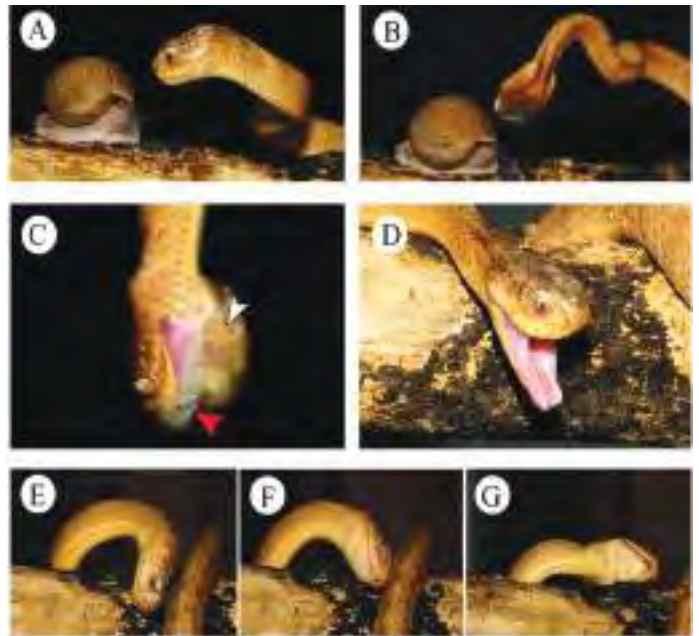
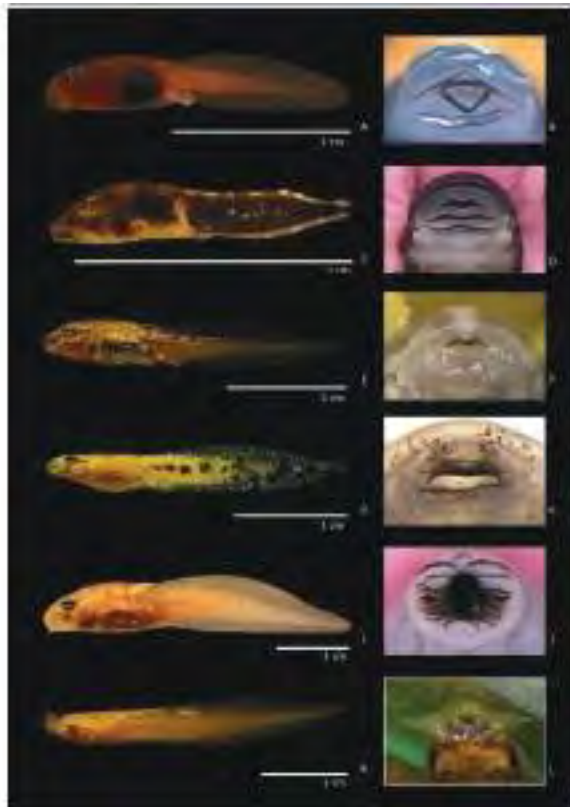
Diversity and taxonomy of amphibians and reptiles, Anuran larvae, Behavioral study



56667585100



0000-0001-7267-1127





# Assoc. Prof. Pramote Chumnanpuen

Department of Zoology

E-mail: pramote.c@ku.th

## Keywords

Bioactive Peptides, Biomimetic Peptides, Systems Biology, Bioinformatics

## Research focus

Medical and Cosmetic applications of Biomimetic Peptides; Bioinformatics Prediction Tools and Pipeline for Functional Peptides Screening



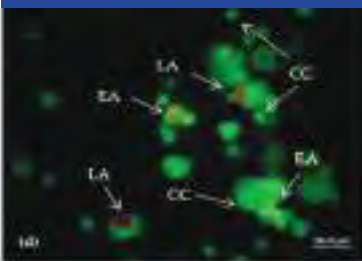
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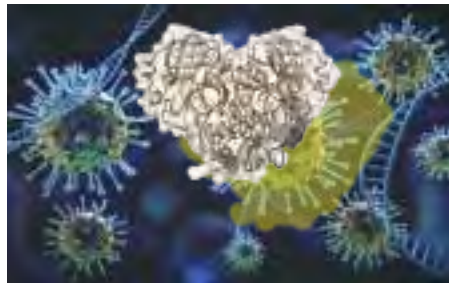


Biomimetic Anticancer peptides from Cordyceps fungus

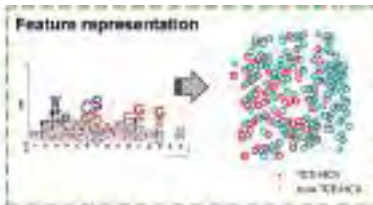
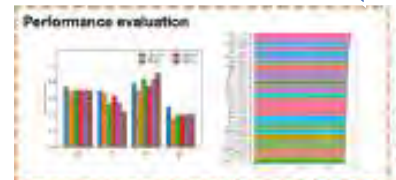
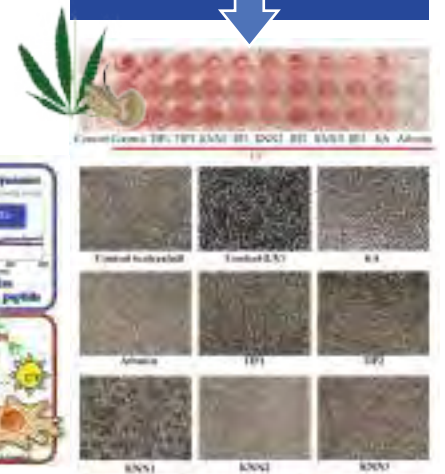


Antimalarial peptides  
Antiviral peptides

- SARS-CoV-2 Main Protease Inhibitor
  - SARS-CoV-2 RdRp Inhibitors
  - Hepatitis C vaccine
- Peptide-based therapy for autoimmune diseases



Antimelanogenic and Tyrosinase inhibitory peptides from abalone, rice, and cannabis





# Assoc. Prof. Supiyanit Maiphae

Department of Zoology

E-mail: fscism@ku.ac.th

## Keywords

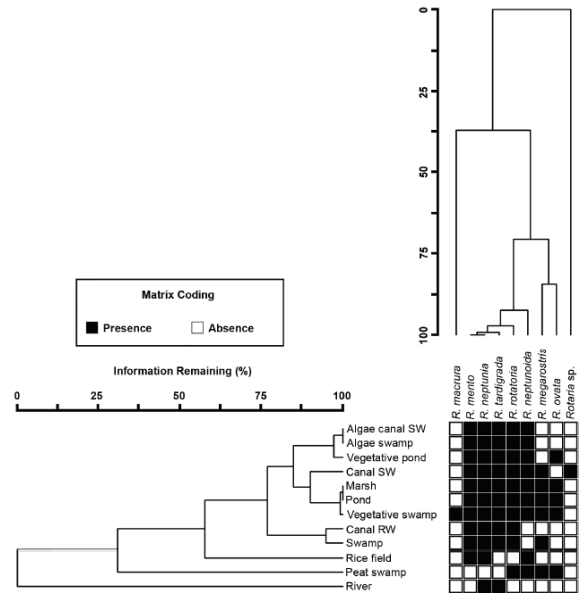
Cladoceran, Rotifer, Copepod, Systematics, Diversity, Ecology, Biogeography



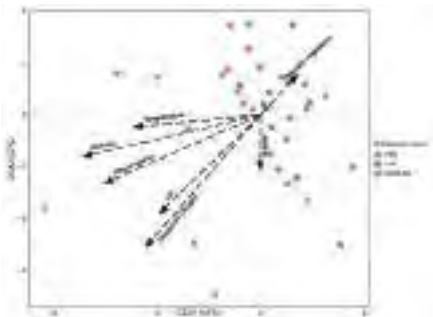
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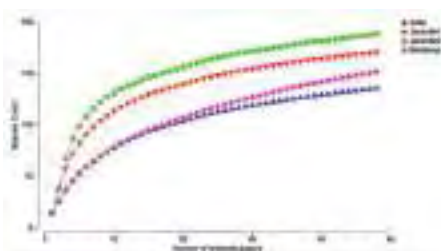
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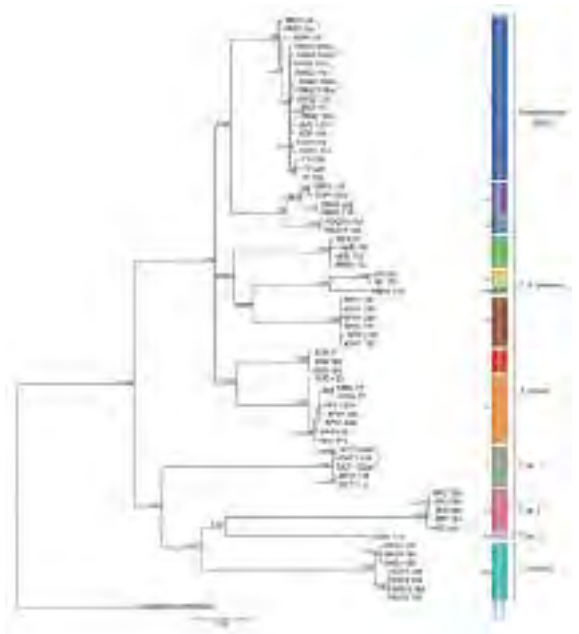
Jaturapruek et al., 2021



Jantawong et al., 2023



Choedchim & Maiphae, 2023



Saetang et al., 2022



# Prof. Vasakorn Bullangpoti

Department of Zoology

E-mail: fscivkb@ku.ac.th

## Keywords

Botanical pesticides, Insect Toxicology, Pest Control



16303191000



000-0001-9192-6375



## Research Focus

My research seeks to provide innovative pest and disease management methods by biopesticide agents (mainly focus on plant allelochemicals) that can reduce the use of synthetic pesticides while still providing long-term control.

Targets mostly focus on pests attacking field crop and/or human health.





# Assoc. Prof. Watchariya Purivirojkul

Department of Zoology

E-mail: fsciwyp@ku.ac.th

## Keywords

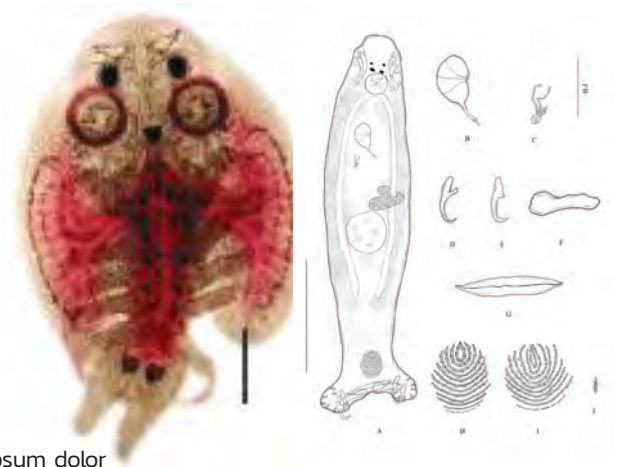
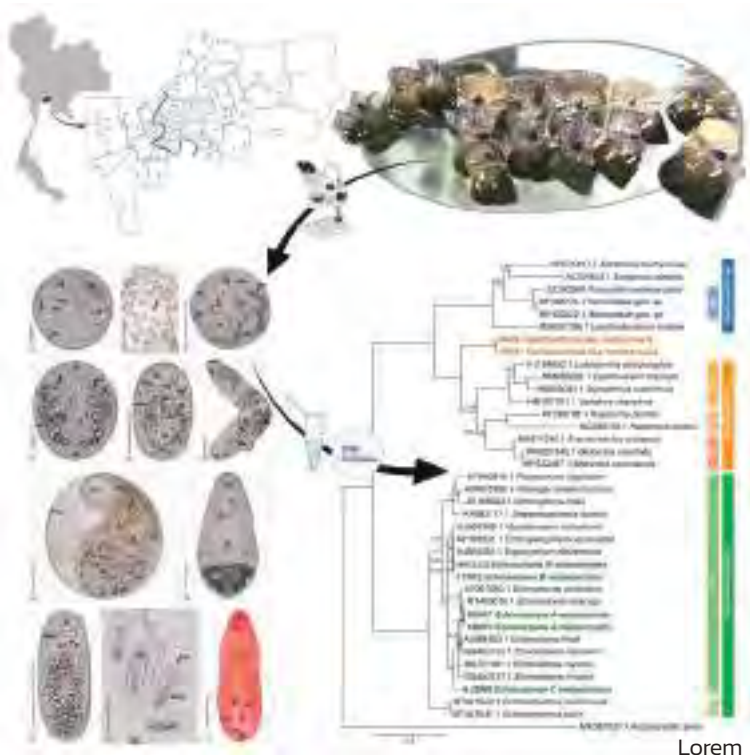
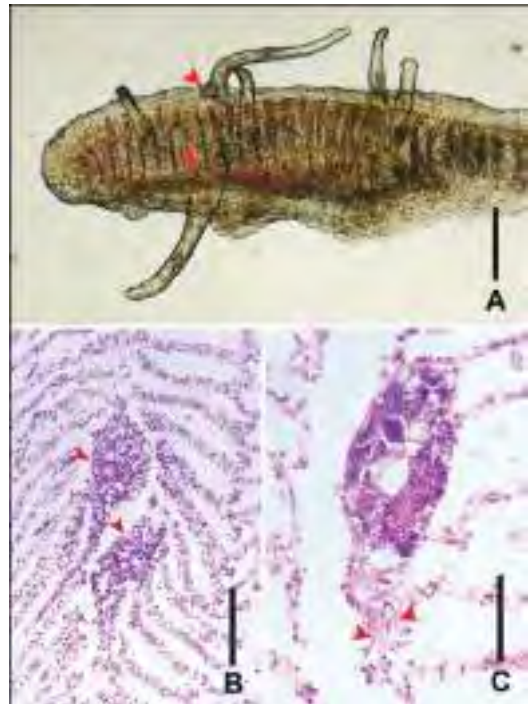
Aquatic parasites, Monogenes, Leeches, Ectoparasites, Endoparasites



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0000-0003-3170-6308



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# Assoc. Prof. Wirasak Fungfuang (DVM)

Department of Zoology

E-mail: fsciwsf@ku.ac.th

## Keywords

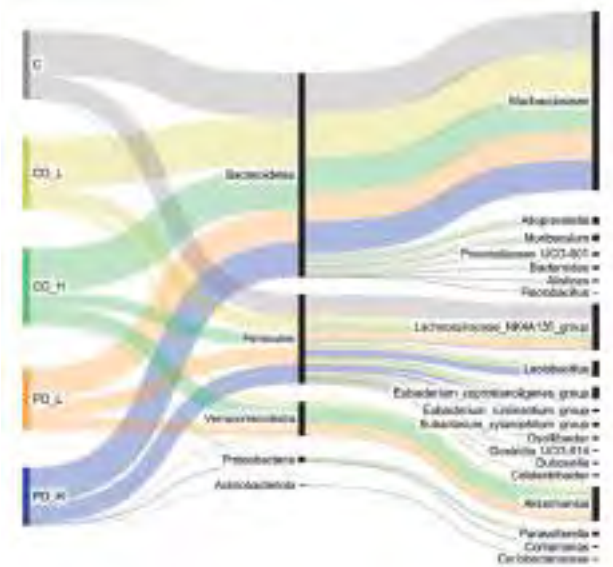
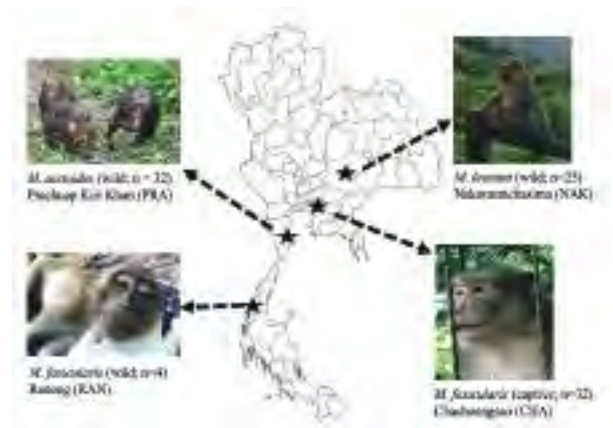
Zoonosis in non-human primate,  
Metabolic disease, Proteomic



26767733400



0000-0001-6689-2804





# 5

## FUTURE AGRICULTURE



## FUTURE AGRICULTURE

At the Faculty of Science, Kasetsart University, our research in future agriculture focuses on innovative and sustainable practices to enhance crop productivity and resilience. We investigate the use of biological constituents in plants for cosmetics and food industries, stimulating high-value phytochemicals and studying plant adaptation to climate change. Our work in food safety, protein allergens, and biomaterials for medical applications includes identifying allergenic proteins in various foods and developing nanoparticles for drug delivery.

We employ advanced techniques such as HPLC, ELISA, and molecular biology to identify metabolites and peptides. Our studies on saline stress in plants aim to understand mechanisms involved in salt stress, while our research on microalgae and plant products explores their applications in food and cosmetics.

Our genomic mapping projects utilize whole genome sequencing to enhance species like and genetic engineering to improve crop resilience and productivity. Through these efforts, we aim to drive innovative and sustainable agricultural practices for a resilient future.



# Asst. Prof. Attawan Aramrak

Department of Biochemistry

E-mail: fsciawa@ku.ac.th

## Keywords

Phytochemicals, Natural Products, Plant Biochemistry, Biotechnology



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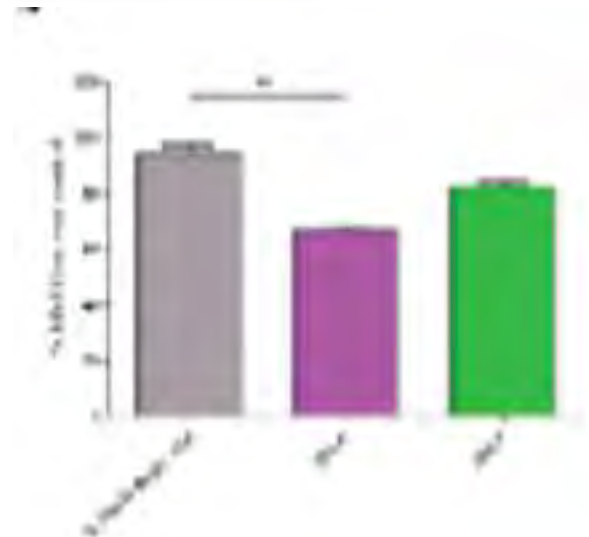
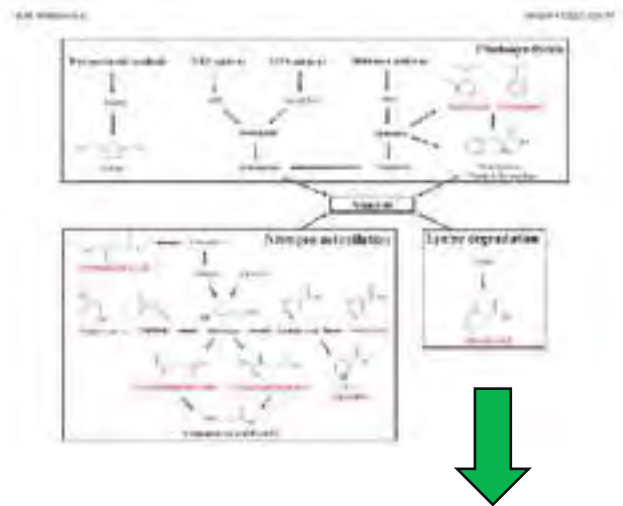


0000-0001-6456-0785



Research field: Plant Biochemistry, Agricultural Biochemistry, Applied Biochemistry

- Utilizing biological constituents in plants for cosmetics and food industries
- Stimulating an accumulation of high-value phytochemicals in plants
- Investigating plant adaptation through the climate change and field management





# Asst. Prof. Chomdao Sinthuvanich

Department of Biochemistry

E-mail: fscids@ku.ac.th

## Keywords

Allergy, Food safety, Biomaterials, Peptides, Extracellular matrix, Tissue engineering



572072035511



0000-0002-1362-2971



Research field: Food safety, protein allergens and Biomaterials for medical applications

- Identifying IgE-binding epitopes of protein allergens and their cross reactivity
- Studying Allergen protein in seafood, edible insects, house dust mites, pollen
- Investigating food safety of edible insect: cricket and silkworm

Biomaterials for medical applications

- Development of nanoparticles from drug delivery
- Improving Cellular Response of Biomaterials through Peptide Functionalization
- Applications in stem cells, bone and cartilage regeneration

Research Techniques

- Identification of metabolites and peptides using HPLC and HPLC/MS
- Protein allergen: SDA-PAGE, ELISA, Western blot, degranulation assay
- Peptide synthesis, purification and conjugation
- Cytotoxicity assay, cell adhesion and proliferation assay, cellular mineralization
- Molecular Biology: RACE-PCR, Cloning, qPCR

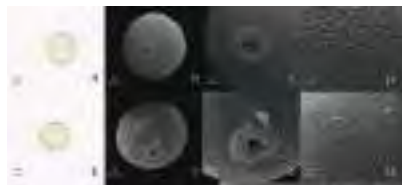
Crustacean



Edible cricket



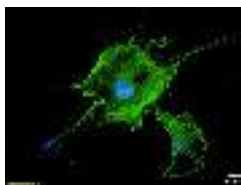
Pollen



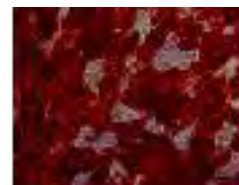
Cell proliferation



Cell adhesion



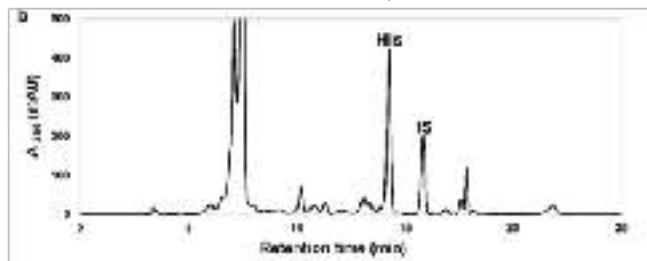
Mineralization assay



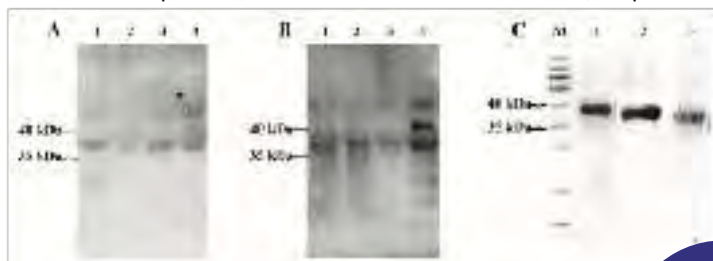
Degranulation assay



Identification of Histamine by HPLC



Western blot probing with volunteers' sera for allergen proteins





# Assoc. Prof. Chotika Yokthongwattana

Department of Biochemistry

E-mail: fscicsk@ku.ac.th

## Keywords

Plant biochemistry and molecular biology, Proteomics, Epigenetics, Plant stress, Allergy



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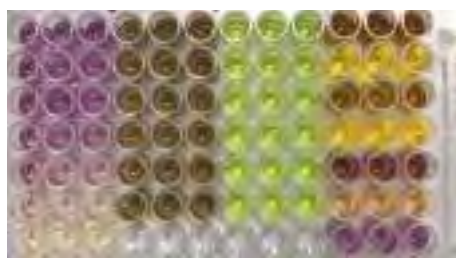
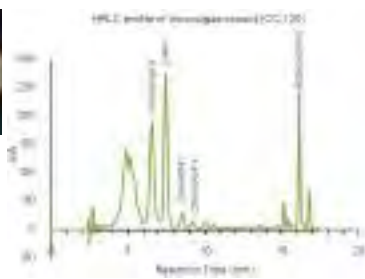


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- Allergen proteins in plants and plant-based foods

Allergic conditions pose a significant global health issue, emphasizing the crucial need for timely detection of allergic reactions for the well-being of patients. Equally important is understanding the presence of allergenic proteins in various plants and plant-based foods. Our goal is to isolate and identify these allergenic proteins to contribute to this knowledge.



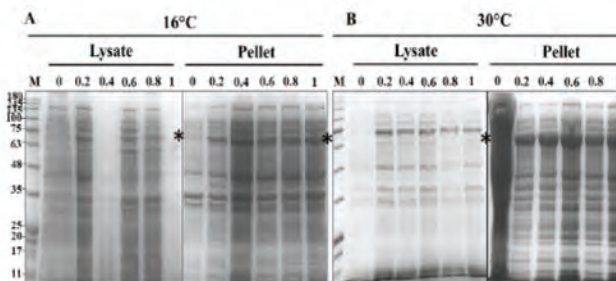
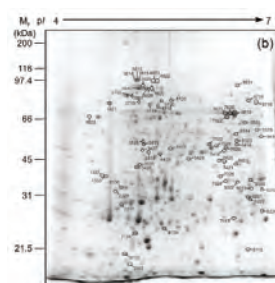
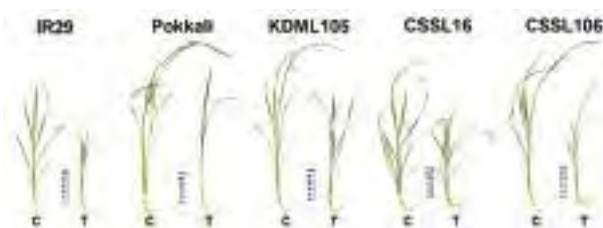
## Research field

- Saline-stress in plants

The issue of soil salinity poses a significant agricultural challenge globally. Our focus is on unraveling the responses and adaptations of plants to extreme saline conditions, aiming to enhance our understanding of the mechanisms involved in salt stress in plants

- Application of plant products in food and cosmetics

We are exploring the utilization of microalgae and plants in both the food and cosmeceutical industries.





# Assoc. Prof. Kiattawee Choowongkamon

Department of Biochemistry

E-mail: kiattawee.c@ku.th

## Keywords

Protein Engineering, Protein Modeling, Computer-aided drug discovery, Biosensor

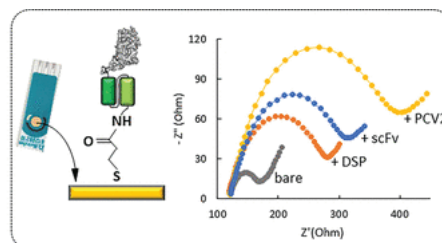
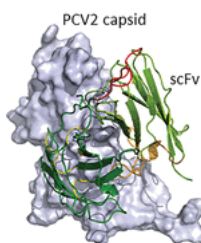
Research field: Protein Biochemistry; Biosensor; Drug Discovery



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0000-0002-2421-7859





# Assoc. Prof. Ratre Wongpanya

Department of Biochemistry

E-mail: fscirtw@ku.ac.th

## Keywords

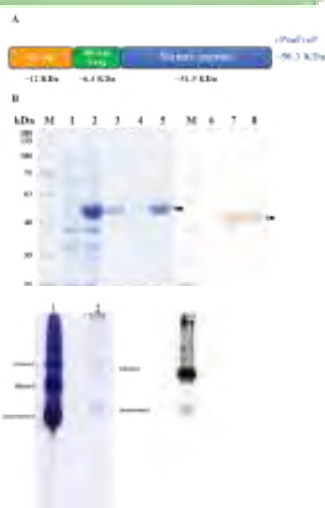
Shrimp, Immune System, Silkworm, Lectin



17436062800



0000-0001-8807-8950



Healthy Shrimp and Effective Silkworm Production



# Assoc. Prof. Sasimanas Unajak

Department of Biochemistry

E-mail: fscissmn@ku.ac.th

## Keywords

Vaccine, Modern vaccine design, Aquatic animal diseases, Biologics, Food safety and security, Detection systems



56919691500



0000-0001-6456-0785



Research field: Plant Biochemistry, Agricultural Biochemistry, Applied Biochemistry

- Utilizing biological constituents in plants for cosmetics and food industries
- Stimulating an accumulation of high-value phytochemicals in plants
- Investigating plant adaptation through the climate change and field management

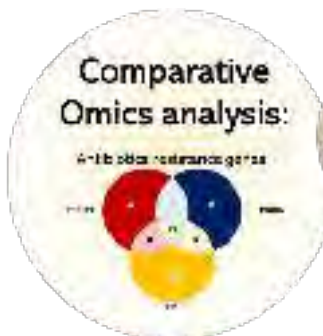
## Aquatic animals' disease characterization



**Pathogen:**  
Identification  
Characterization  
Propagation

**Bacteria**

**Virus**



## Vaccine design

### Inactivated vaccine

- Precise selection of pathogen seedling for vaccine development
- Excellent vaccine efficacy and immunostimulation
- Scientific data support: field trial



### Disease detection



### Chemical/ antibiotics detection



## Structural multimeric chimeric multiepitope vaccine (CMEV) design



- Combining of multiepitope from pathogens
- Exhibit excellent vaccine efficacy

## Novel vaccine delivery system + Oral vaccines

**Nanoparticle development for orally vaccine delivery**







# Asst. Prof. Wannarat Phonphoem

Department of Biochemistry

E-mail: fsciwrp@ku.ac.th

## Keywords

Plant biochemistry, Stress tolerance mechanism, Phytochemicals, Genetic engineering

Research field

- Molecular characterization of drought responsive genes in rice



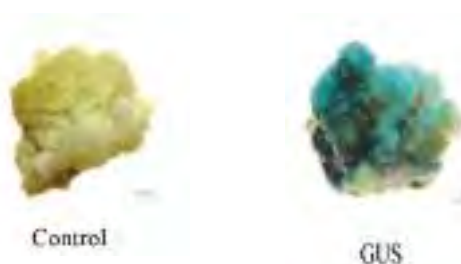
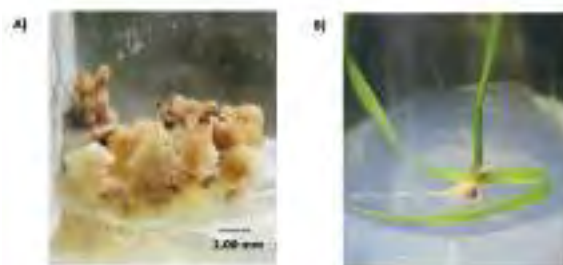
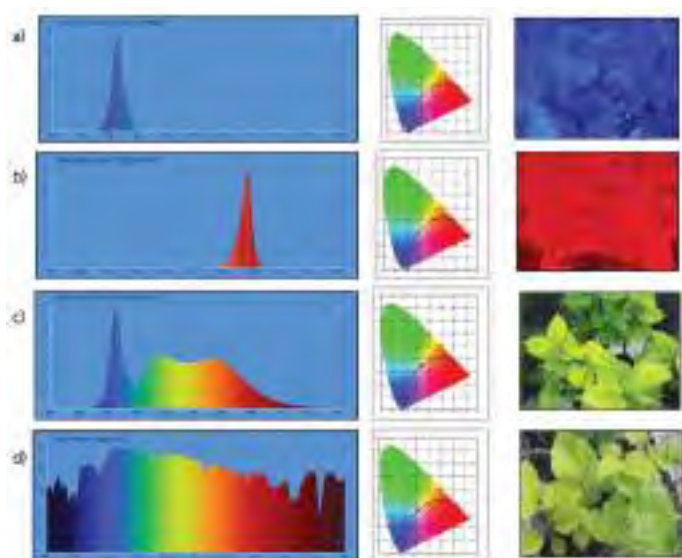
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- Targeted use of light-emitting diodes (LEDs) on plant growth and bioactive compound production
- Establishment of plant cell suspension culture for producing high-value recombinant proteins





# Dr. Worapong Singchat

## The International Undergraduate Program in Bioscience and Technology

E-mail: worapong.si@ku.th

### Keywords

Comparative Genomics, Chromosome Map, Population genetics



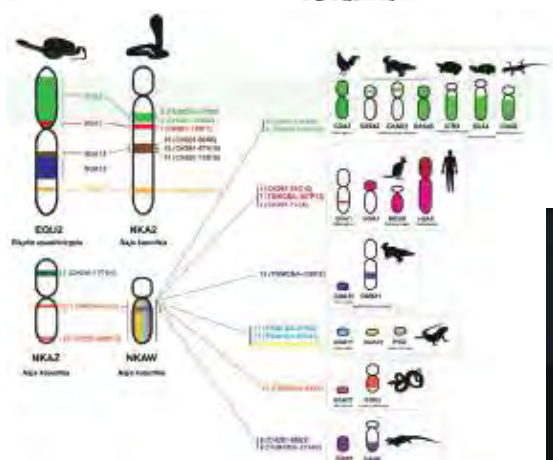
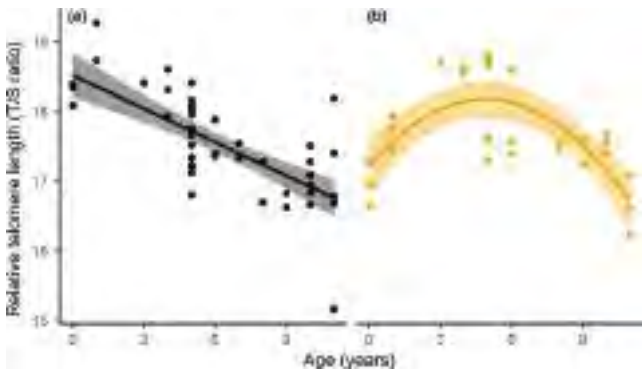
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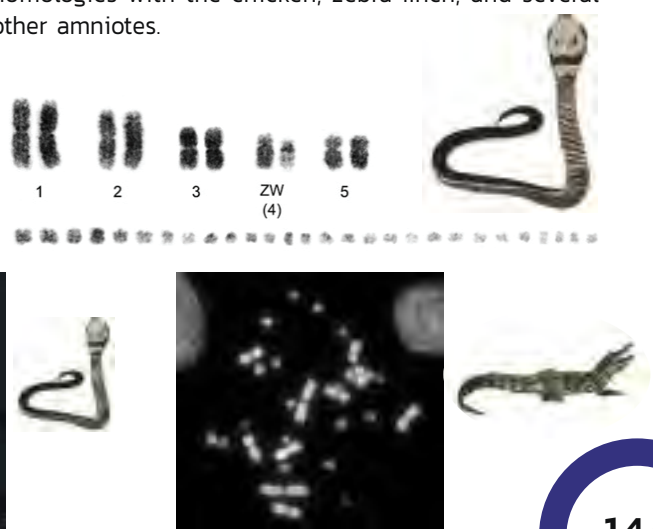
Relationship between age and relative telomere length in male (a) and female (b) Siamese cobra.



### Research field

- **Genetic Enhancement for Economic Species**  
Employing modern genetic markers, the research enhances species like chicken, crocodile, snake, and catfish. Emphasizing sustainability, it employs smart agriculture for improved breeding.
- **Endangered wildlife Conservation**  
Focusing on critically endangered animals, conservation efforts address genetic and habitat factors, aiming for biodiversity preservation and species survival.
- **Genomic Mapping for Valuable Phenotypic Traits**  
Conducting whole genome sequencing (WGS) and constructing high-quality de novo reference genomes, the project utilizes multiple platform technologies to perform comparative genomics and in silico gene mapping for traits such as sex, immune response and growth.

Karyotype and chromosome maps of the Siamese cobra chromosome 2, and Z and W chromosomes showing homologies with the chicken, zebra finch, and several other amniotes.





# Prof. Kanapol Jutamane

Department of Botany

E-mail: faaskpj@ku.th

## Keywords

Brassinosteroids, Photosynthesis, Pollination, Kaolin, Tropical fruit

Research field: Plant physiology, Agronomy, Horticulture, Soil Science

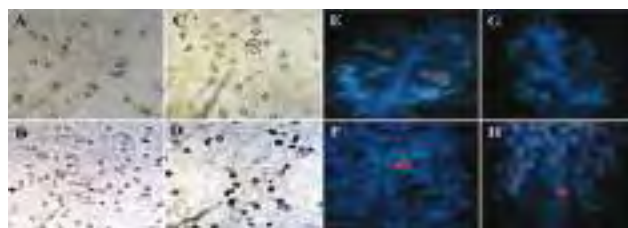
Research topic: Pollination, fruit set and stress response, particularly in relation to photosynthesis and hormones



55159740100



0000-0001-6125-3632





# Dr. Kanin Rungwattana

Department of Botany

E-mail: kanin.run@ku.th

## Keywords

Drought, plant adaptation, tropical tree, wood and leaf functional trait, xylem vessel

Research field: Agricultural plant science; Plant ecophysiology; Plant structure and function; Plant adaptation

Research topic

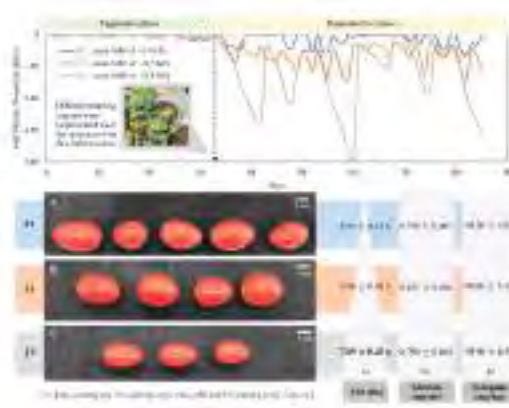
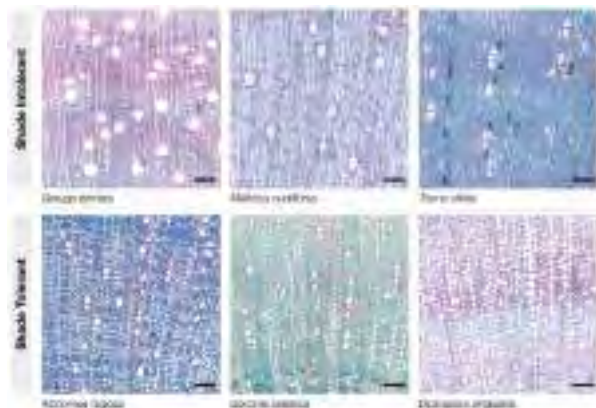
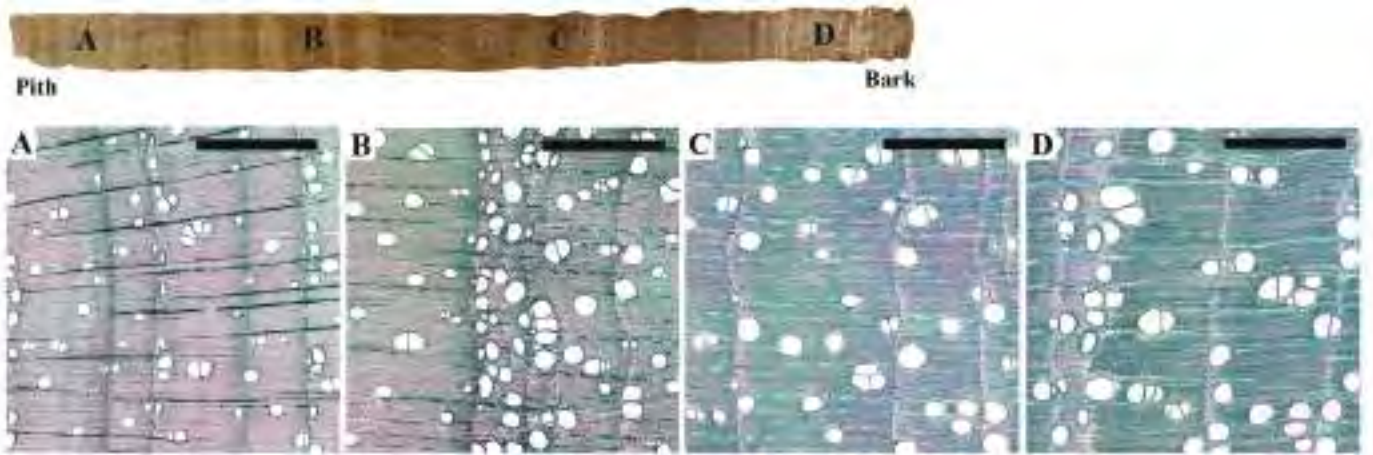
- Adaptive traits to drought resistance in rubber tree
- Xylem hydraulic traits reflect life history strategies of tropical tree seedlings in seasonal dry forest
- Drought resistance in tropical tree seedlings
- Plant productivity of cherry tomato grown under different irrigation regimes



57195576474



0000-0001-6151-2681





# Dr. Narong Wongkantrakorn

Department of Botany

E-mail: fscinrw@ku.ac.th

## Keywords

Plant tissue culture, In vitro culture, Stress physiology, NaCl stress, Drought stress

## Research field

Plant tissue culture, Plant Physiology

## Research topic

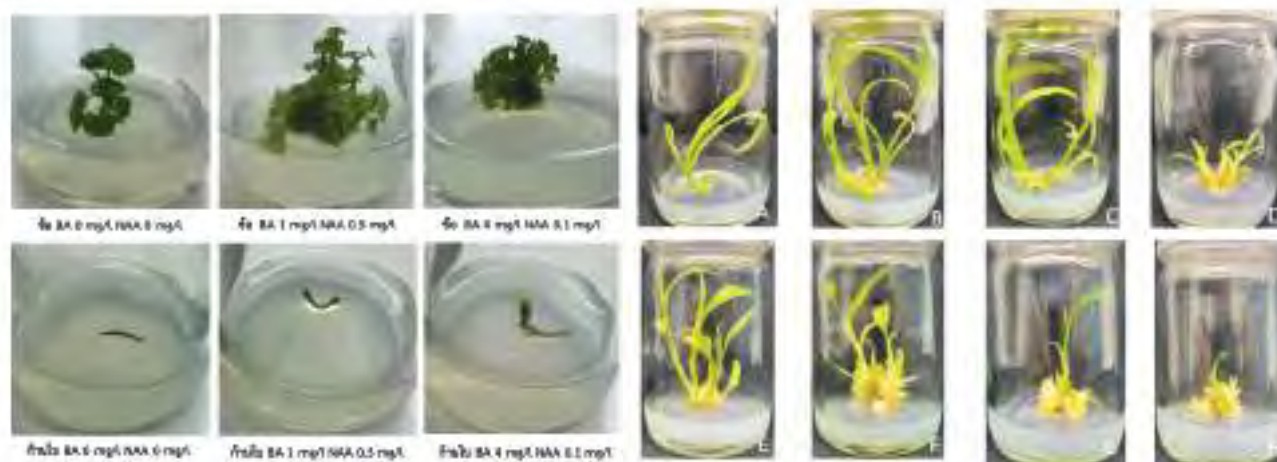
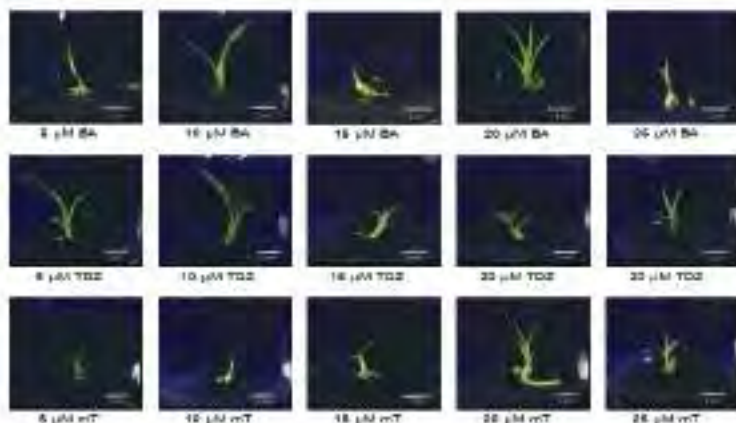
*In vitro* culture of ornamental plants, medicinal plants. *In vitro* selection for drought and salt stress tolerance in plants.



34067893200



0000-0003-3148-4960





# Assoc. Prof. Prapasiri Pongprayoon

Department of Chemistry

E-mail: fsciprpo@ku.ac.th

## Keywords

Albumins, miRNA, MD simulations, Chicken, Diabetes, Herbs



35387039800

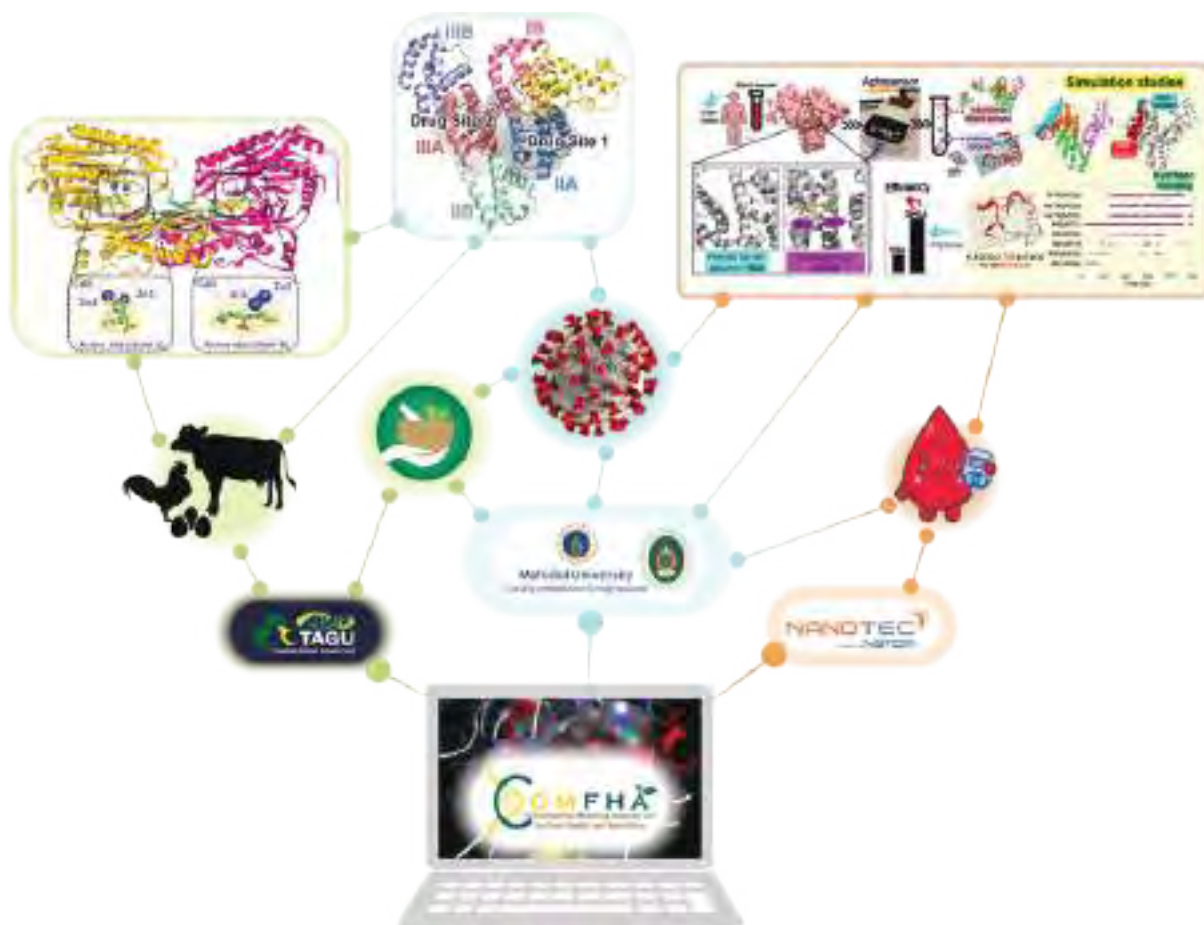


0000-0002-1472-8241



## Research topics

- Modelling of graphere-based aptasensor
- Modelling of food and agriculture-related proteins
- Simulations of membrane proteins
- Simulations of bacterial membrane systems
- Simulations of nanopores





# Dr. Tharinee Saleepochn

Department of Chemistry

E-mail: tharinee@ku.th

## Keywords

Pesticide, LC-MS, GC-MS, antioxidant



53264856100



0000-0003-4663-4511



Developing a method for analyzing key substances, such as

- Pesticides (insecticide, and herbicide)
- Antioxidant compounds (flavonoids, ascorbic acid)
- Fatty acid

Develop a sample preparation protocol to extract, isolate, or concentrate the target substances from the matrix.





# Dr. Thitaphat Ngernsutivorakul

Department of Chemistry

E-mail: fscithn@ku.ac.th

## Keywords

Analytical chemistry, Sample preparation, SERS, Nanotechnology, Cannabis & Neuroscience Applications



57074189800



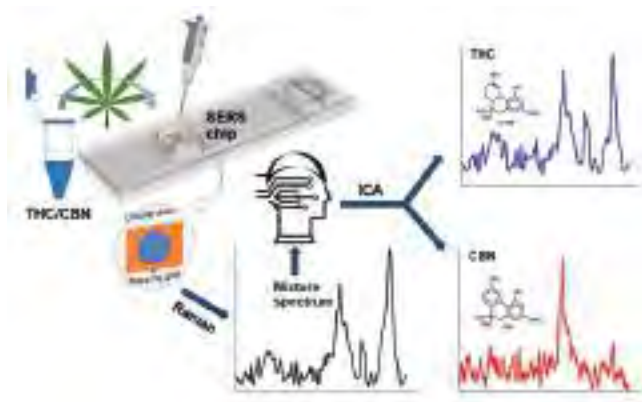
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## Research field

- Sample preparation and separation techniques
- Raman and SERS-based sensors for trace analysis of biomolecules
- Microfluidics, nanotechnology, and bioanalytical applications

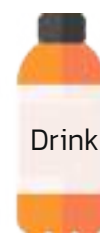
## Raman-SERS method for cannabinoid analysis



## Miniaturized sample preparation method for analysis of target molecules in complex samples



Oil



Drink



Body fluid





# Dr. Akrapong Swatdipong

Department of Genetics

E-mail: fsciaps@ku.ac.th

## Keywords

-

## Research topic

Population and conservation genetics in aquatic species, and fishery management



57202567367



0000-0002-4966-5471





# Assoc. Prof. Anchalee Sirikhachornkit

Department of Genetics

E-mail: fscialsk@ku.ac.th

## Keywords

Brassinosteroids, Photosynthesis, Pollination, Kaolin, Tropical fruit



6507715112



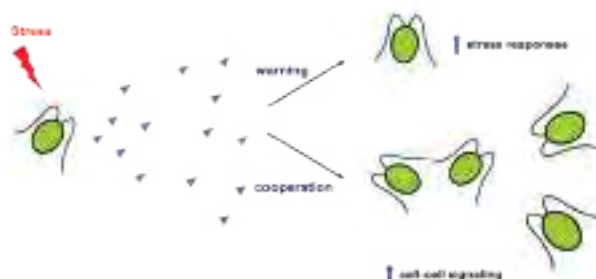
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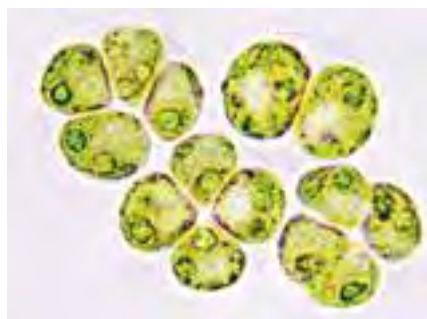
## Research field

Climate change resilience in photosynthetic organisms using the unicellular green microalga *Chlamydomonas reinhardtii* as a model system: towards sustainable agriculture and biodiversity preservation

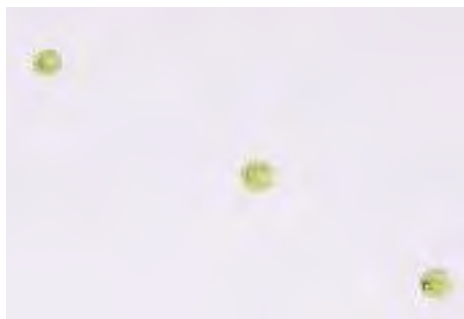
- Acclimation response to high temperature
- Natural strains exhibiting different levels of stress tolerance
- Cell-cell communication



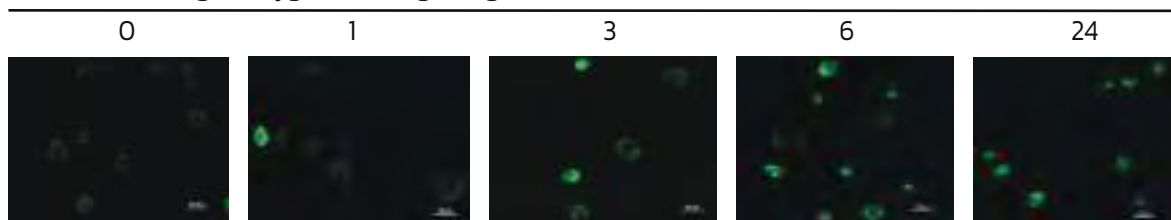
Cells under control conditions



Palmelloid cells exhibiting increased stress tolerance



Singlet oxygen as a signaling molecule under heat stress (hours under heat)





# Asst. Prof. Anongpat Suttangkakul

Department of Genetics

E-mail: fsciapsu@ku.ac.th

## Keywords

Genome editing, Genetic engineering, Plant Autophagy, Crops, Promoter analysis



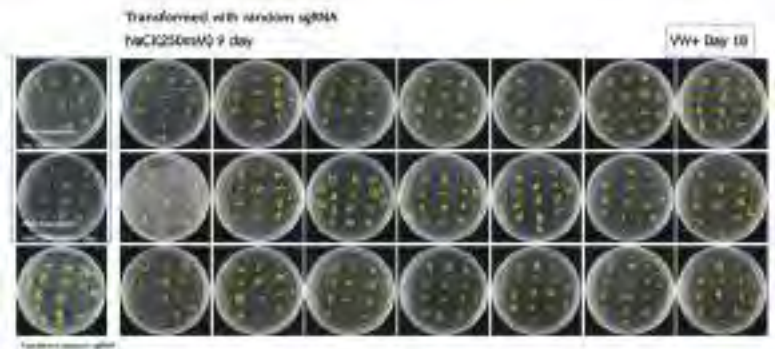
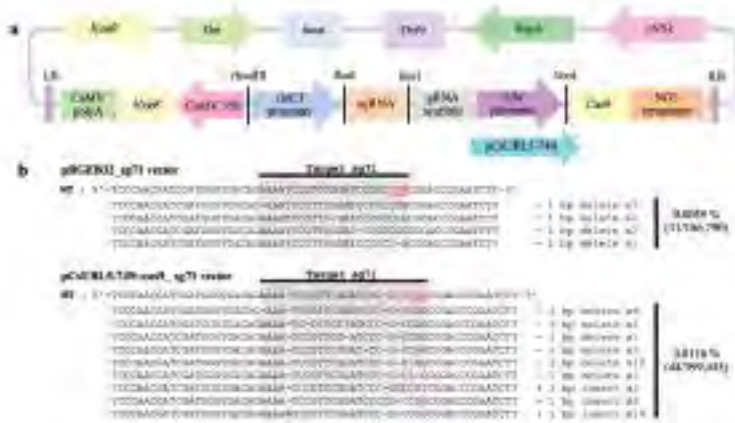
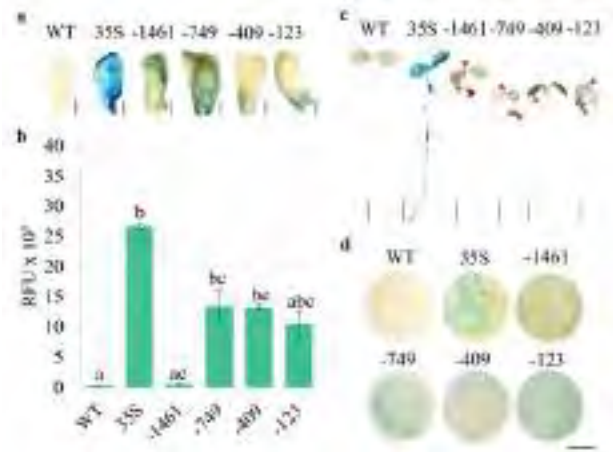
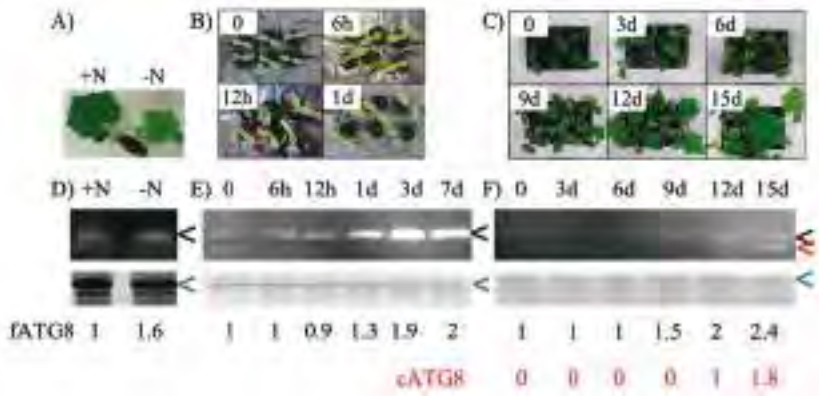
12766061400



0000-0001-5512-683X

## Research Focuses

- Genome editing in crops for plant improvement
- Genetic engineering in crops for plant improvement
- Promoter analysis for developing tools
- Plant autophagy for responses to stresses





# Prof. Arinthip Thamchaipenet

Department of Genetics

E-mail: fsciatt@ku.ac.th

## Keywords

Actinomycetes, Endophytes, Phytobiome, Drug Discovery, Genome Analysis, Duckweed



Scopus

12766061400

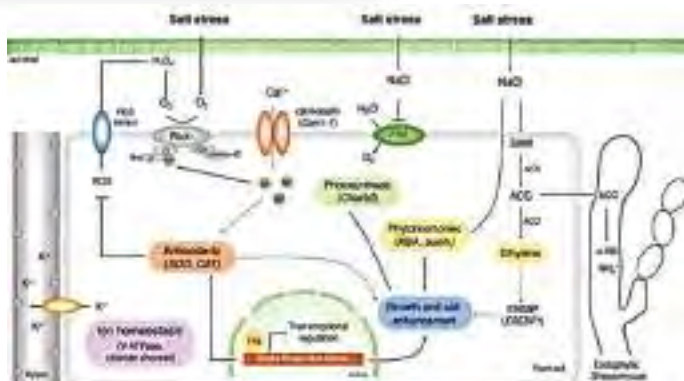
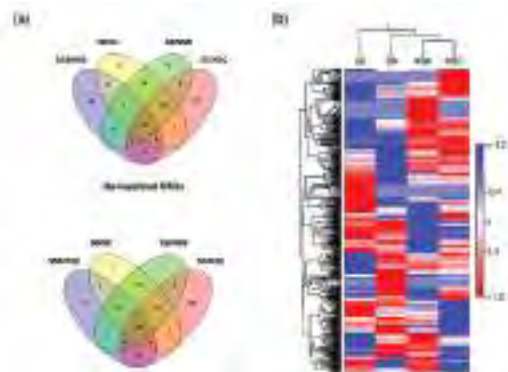
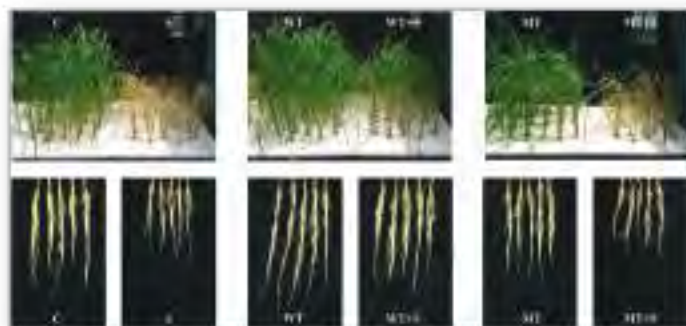


ORCID

0000-0001-5512-683X

## Research Focuses

- Endophytic actinomycetes enhance plant health and immunity to fight environmental stress and phytopathogens
- Duckweed microbiome towards biomass, nutrition, bioactive substances, stress tolerance, and wastewater treatment
- Genome analysis and gene manipulation of actinomycetes for novel drug discovery  
0000-0002-8749-0414 View this author's ORCID profile





# Assoc. Prof. Chatchawan Jantasuriyarat

Department of Genetics

E-mail: fscicwj@ku.ac.th

## Keywords

Avirulence gene, Defense response, Genetic diversity, Rice blast fungus



6507379922

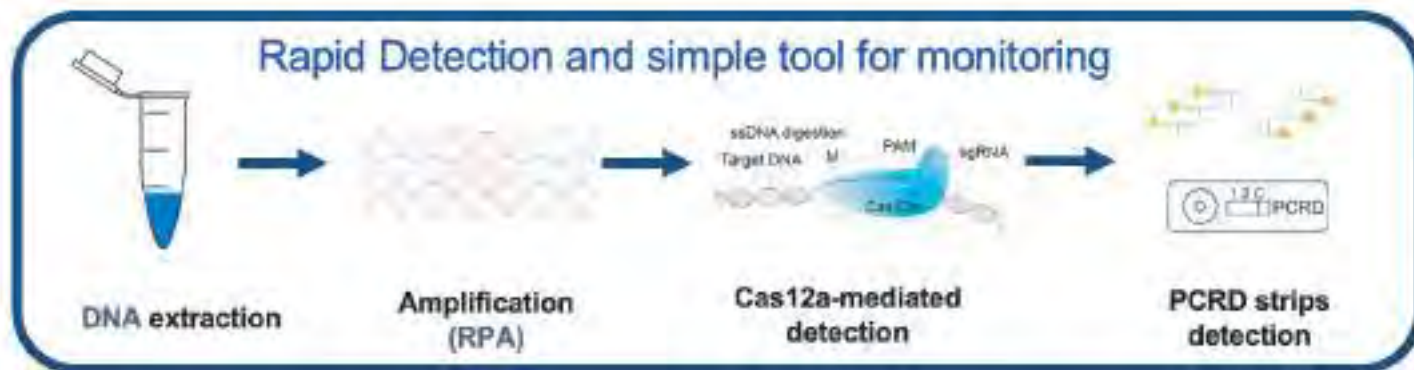
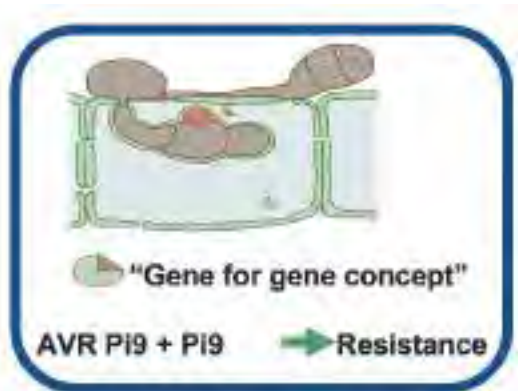


0000-0002-7278-9704



Research field: Rice & Rice Blast Fungus Interactions, Plant Molecular Genetics

- Identification and Functional Characterization of Rice Blast Fungus Virulence Genes
- Whole-genome Sequence Analysis and Genetic Diversity of Rice Blast Fungus
- Cloning of Rice Blast Resistance Genes from Thailand Rice Varieties
- Development of Rapid Diagnostic kits for Rice Blast Fungal Avirulence Genes





# Asst. Prof. Sirithorn Kongseng

Department of Genetics

E-mail: sirinthorn.kon@ku.th

## Keywords

Population genetics, Conservation genetics and Fishery management

## Research Topic

Population genetics in aquatic species and fishery management



6507715112



0000-0001-6099-106X





# Assoc. Prof. Supachai Vuttipongchaikij

Department of Genetics

E-mail: fsciscv@ku.ac.th

## Keywords

Gene editing, Genetic engineering, Plant cell wall, Crops, Cassava, Polysaccharides



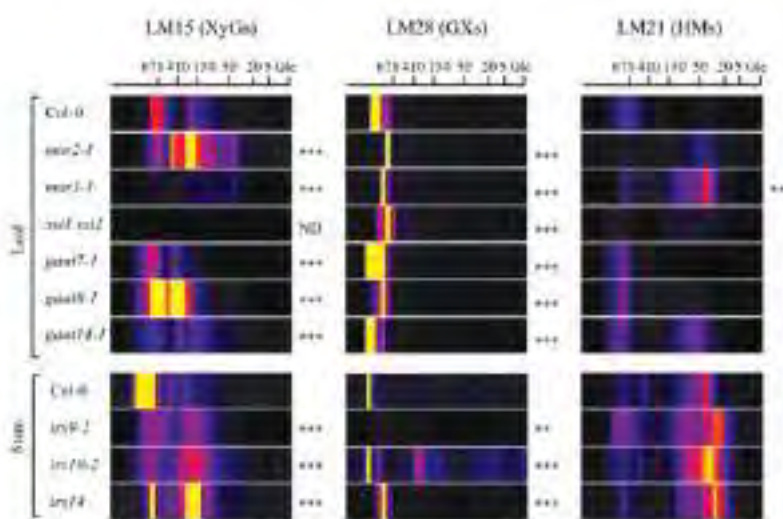
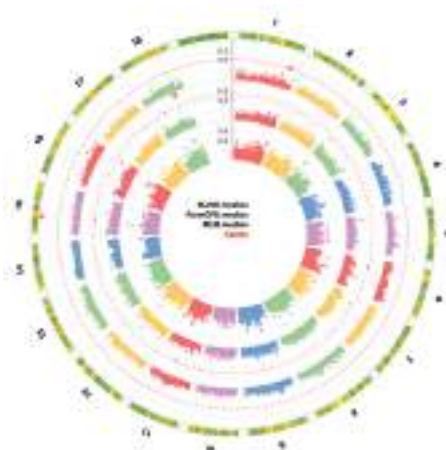
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0000-0001-6099-106X

## Research Focus

- Gene editing in crops as a mean for breeding
- Genetic engineering in crops as a mean for gene function analysis and crop breeding
- Cell wall biosynthesis and plant development
- Genomic approach for cassava breeding





# Asst. Prof. Teerasak E-kobon

Department of Genetics

E-mail: fscitse@ku.ac.th

## Keywords

Bioinformatics, Computational Biology, Omics of Animal and Human Infectious Diseases, Gastropod Mucus Application

## Research Focus:

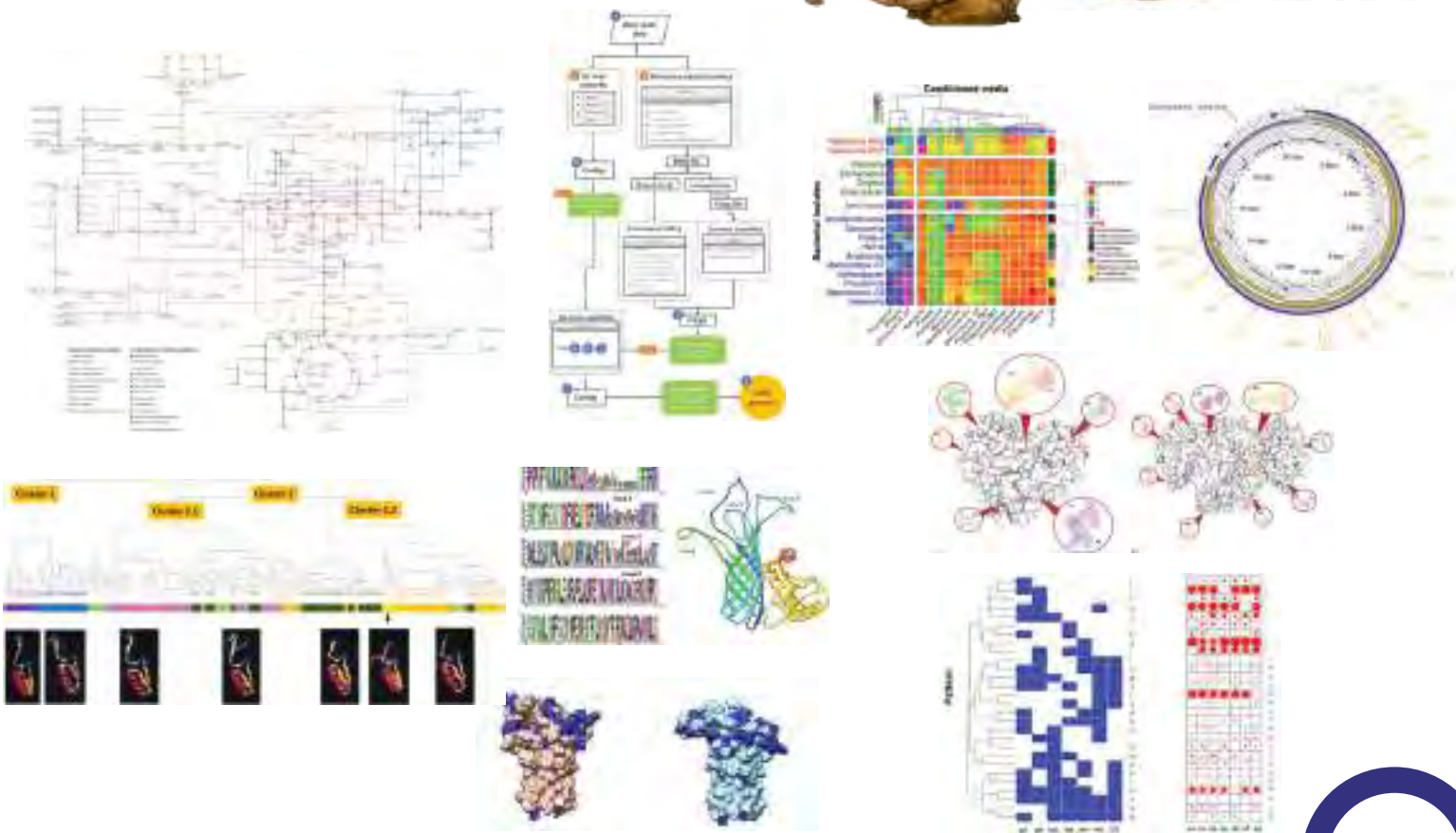
- Development of tools and workflows for Omics data analysis
- Utilization of microbial Omics data for disease monitoring and treatment
- Gastropod functional genomic exploration for commercial application



56692918900



0000-0002-3919-9841







# Assoc. Prof. Wanvimol Pasanphan

Department of Materials Science

E-mail: wanvimol.p@ku.th

## Keywords

Functional polymers, Bio-based materials, Electron beam processing, Nanotechnology, Coatings/Printing materials



23390673000



0000-0003-1221-4455



## Research Focus

- Electron beam processing and green chemistry
- Biochemicals, bio-based materials, and bioplastics
- Nanostructured polymers, nanohybrid, nanocomposite
- Molecular/process design for industrial applications
- High energetic radiation for advanced nanomaterials



## Selected publications (Tier 1, Q1)

- Journal of Food Engineering, 2024, 364, 111794.
- Progress in Organic Coatings, 2024, 186, 108091.
- European Polymer Journal, 2024, 203, 112670.
- ACS Sustainable Chemistry and Engineering, 2022, 10, 51, 17027.
- ACS Sustainable Chemistry and Engineering, 2023, 10 (8), 2653.
- Progress in Organic Coatings 2022, 163, 106658.
- Carbohydrate Polymers, 2021, 257, 117610
- International Journal of Nanomedicine, 2023, 16, 6857
- Polymer Degradation and Stability, 2021, 163, 109619.

## Materials for healthcare and cosmeceuticals

Active compound nano-encapsulation  
 Nanocarrier, drug targeting, controlled-release  
 Nano therapeutic & therapeutic agents  
 Functional hydrogels/nanogels

## Functional and engineering materials

**Bio-coating & Bio-inks**

**EB/UV curable coating & ink**

**Functional & printable coatings**

- Antioxidant
- Antimicrobial
- Antivirus
- Water repellent
- Conductive

**Superhydrophobic & waterproof coatings**

Covered paper, UV-coated paper

Printable bio-inks, Water repellent coating

## Materials for food and agriculture

Active film for extending shelf life of food and fruits

FUNCTIONAL BIOPLASTICS

Nano-fertilizer & water saving material for plant treatment and soil amendment

Young tomatoes



# Asst. Prof. Chanita Boonmak

Department of Microbiology

E-mail: chanita.bo@ku.th

## Keywords

Environmental Microbiology, Bacteria, Plant-Microbe Interaction, Wastewater



26535531400



0000-0001-6012-1777



## Research Area of Interest

1. Multidimensional symbiosis of duckweed-microbes holobionts
2. Development of plant growth promoting (PGP) technology for biomass production of duckweed
3. Diversity and PGP potential of mangrove bacteria
4. Biomineralization in bacteria and their applications

## The S-Curve: 10 Targeted Industries of Thailand

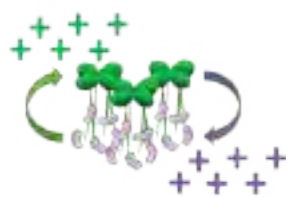
- Low carbon type wastewater treatment management and creation of resource recycling industries
- Novel functional plant (duckweed)-based protein for food and animal feed

## Research Collaborations

- 2017–2019 ALCA, Japan in project "Effective Aquatic Biomass Production Utilizing Mutualistic Microorganisms: The duckweed model"
- 2021–2025 SATREPS, Japan in project "Development of duckweed and associated microbial resource values towards Bio-Circular-Green (BCG) economy"



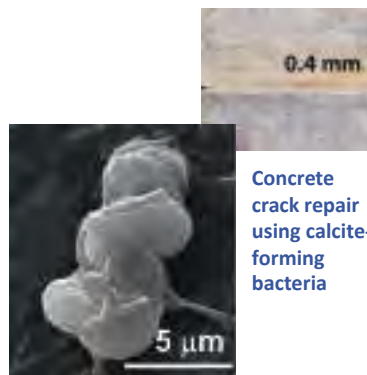
## Duckweed



Starch Protein RICH



Duckweed functions as a water purification agent



Concrete crack repair using calcite-forming bacteria





# Asst. Prof. Pannida Khunnamwong

Department of Microbiology

E-mail: pannida.kh@ku.th

## Keywords

Yeast Taxonomy, Yeast Diversity, Biological Control, Yeast biotechnology



56357967300



0000-0001-7536-929X



## Yeast Taxonomy and Diversity

> Discovering of new taxa in Thailand



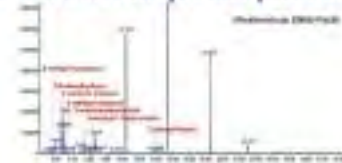
## > Yeast diversity in natural habitats



> Sugar alcohol-producing yeasts  
> Carotenoid-producing yeasts

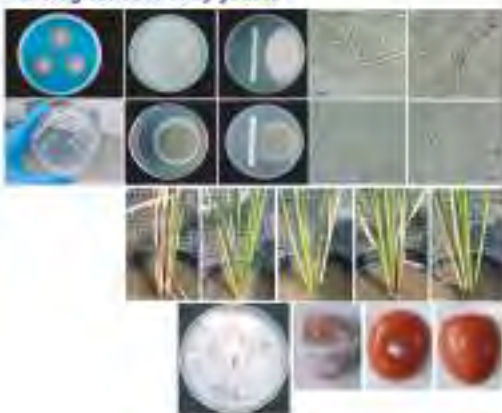


> Volatile compound-producing yeasts



## Yeast in Food and Agricultural Sciences

> Biological control by yeasts

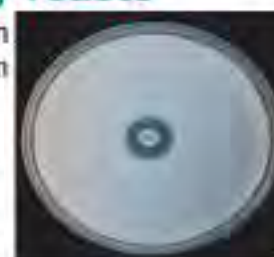


## Bioplastic-degrading Yeasts

Degradation activity on PBS medium

Antagonistic activity of yeasts against plant pathogenic fungi :

- *Rhizoctonia solani* (sheath blight disease)
- *Curvularia lunata* (dirty panicle disease)
- *Fusarium moniliforme* (bakanae disease)
- *Sclerotium rolfsii* (stem and fruit disease)





# Dr. Piyangkun Lueangjaroenkit

Department of Microbiology

E-mail: piyangkun.lu@ku.th

## Keywords

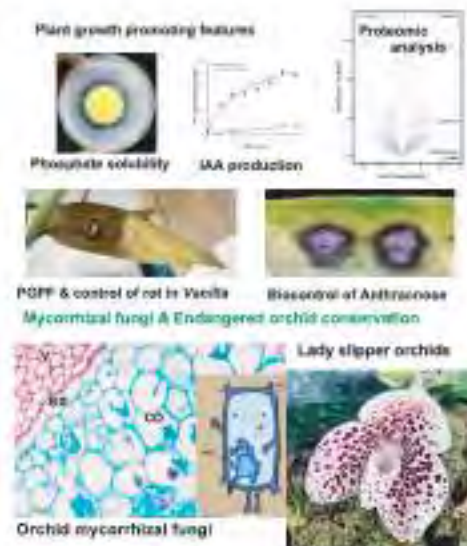
Mycology, Fungi, Mushroom, Fungal diversity, Fungal taxonomy, Fungal biotechnology



26041254300



0000-0002-1362-2971



## Fungal Biotechnology in Agricultural and Environmental Applications

### Fungal Bioremediation

0 1 1.5 h *Trametes polyzona*

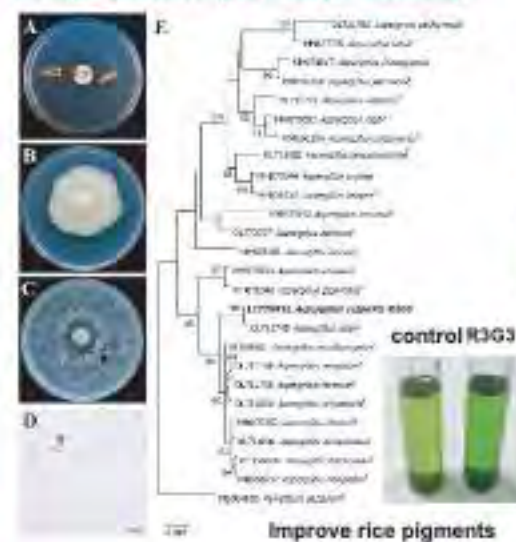
Ligninolytic enzymes Evaluation of toxicity

Toxic aromatic compound bioremediation

Novel fungi from Amphipod gut

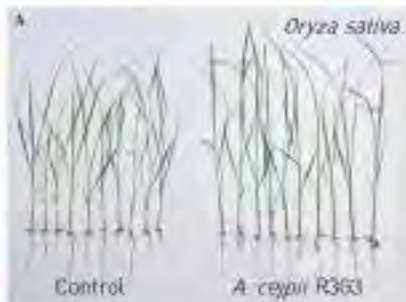
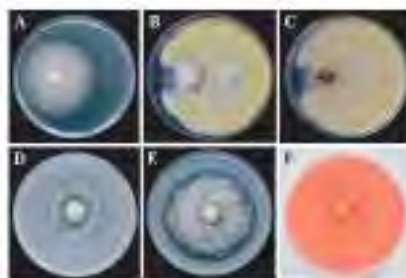
### Fungi in Agricultural Sciences

#### Fungal taxonomy & Fungal diversity



Plant growth promoting fungi (PGPF) using as biocontrol agents against plant pathogenic microorganisms

#### Role of cell wall degrading enzymes against fungal plant pathogens





# Asst. Prof. Prissana Wiriyajitsomboon

Department of Microbiology

E-mail: fscipnw@ku.ac.th

## Keywords

Beneficial microorganisms, Sustainable agriculture, Mushrooms, Macrofungi, Fungal diversity, Fungal taxonomy



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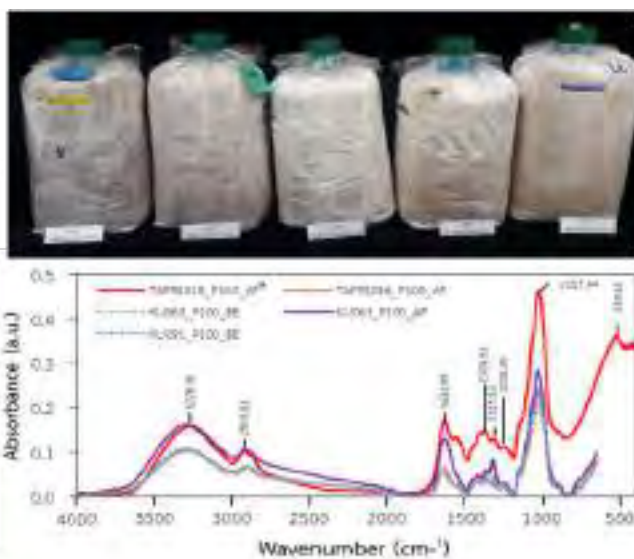
0009-0002-6535-9674

## Research field

- Agricultural Microbiology  
The role of beneficial microorganisms in the enhancement of crop productivity and disease management to achieve sustainable agriculture
- Applications of mushroom and macrofungi  
Development of mycelium-based materials from mushroom and macrofungi
- Fungal diversity and taxonomy

Diversity of microorganisms associated with endosphere and rhizosphere

Taxonomy of endophytic and rhizospheric microbes





# Asst. Prof. Yaovapa Aramsirirujwet

Department of Microbiology

E-mail: fsciypt@ku.ac.th

## Keywords

Mushrooms, Mushroom crude extract, Bioactive compound, Fungal biodiversity



Scopus

57148398900



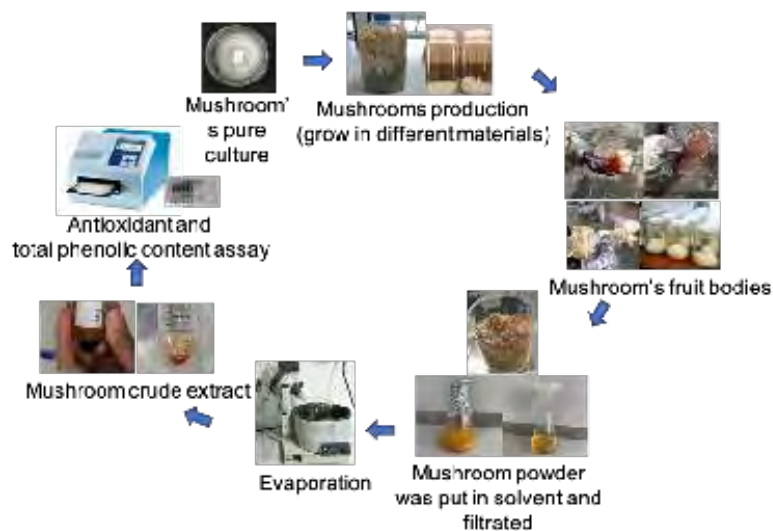
ORCID

0000-0002-2694-4291



## Research Focuses

- Mushrooms and macrofungi, biodiversity, utilities and strain improvement
- Mushroom cultivation and extraction for their crude extract to test the properties in bioactive compound
- Finding the method to increase mushroom yield and biological efficiency
- Recycling and value-adding of spent mushroom substrates (for zero waste)
- Isolation and identification of filamentous fungi and their abilities





# Dr. Mayura Veerana

**Department of Applied Radiation and Isotopes**

E-mail: fscimuv@ku.ac.th

## Keywords

Non-thermal atmospheric pressure plasma, Plasma applications, Microorganisms, Fungal enzymes secretion, Plant growth and development, Plant stress responses, Molecular biology



56281390600



0000-0001-8472-6471

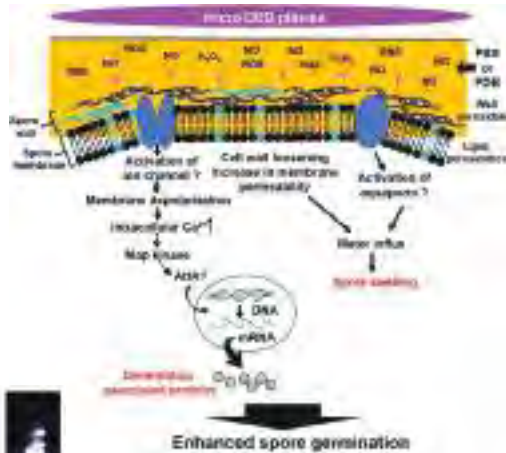


## Research Focus

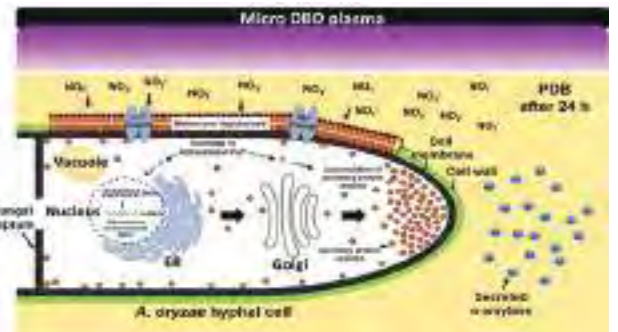
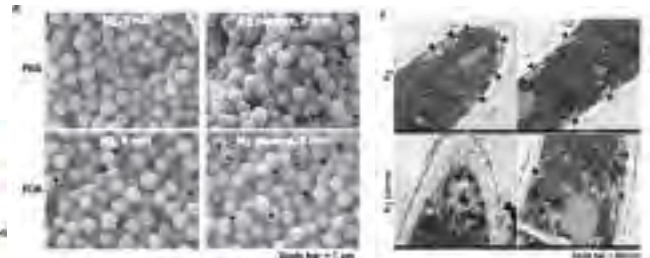
- Enhancement of germination and enzyme secretion in beneficial fungi using non-thermal atmospheric pressure plasma.
- Inactivation of plant pathogens using non-thermal atmospheric pressure plasma.
- Enhancement of plant growth and development using non-thermal atmospheric pressure plasma.
- Effects of non-thermal atmospheric pressure on plant stress responses.



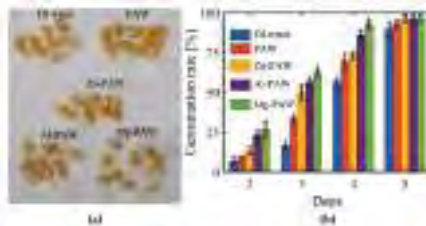
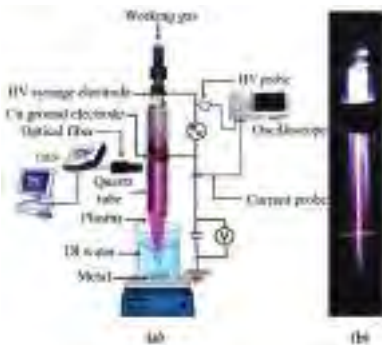
Fungal spores ( $10^7$ ) in 1 ml of PBS or PDB



Enhanced spore germination



A. oryzae hyphal cell





# Assoc. Prof. Peeranuch Jompuk

Department of Applied Radiation and Isotopes

E-mail: fsciprk@ku.ac.th

## Keywords

Mutation Breeding, Ornamental Plant, Corn Breeding, radiation,

## Research Focus

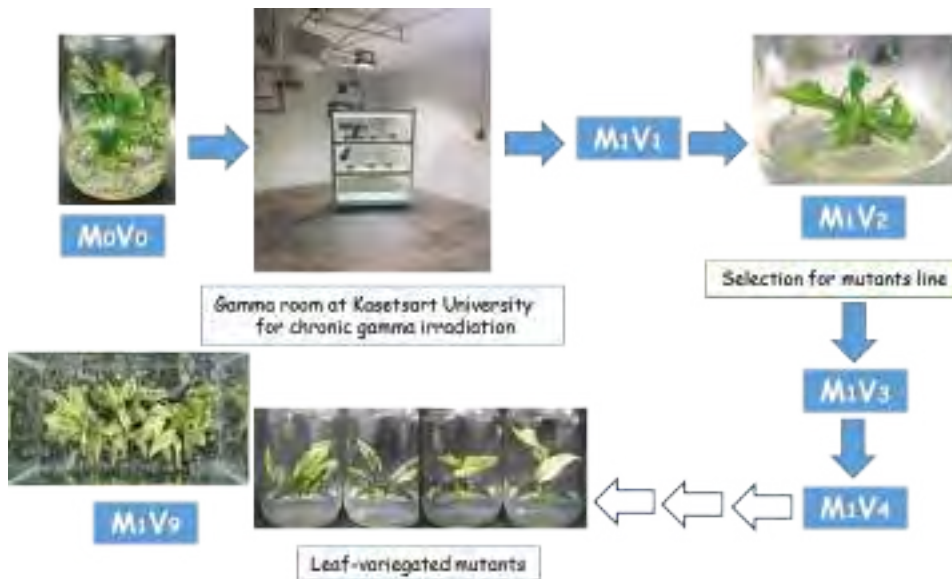
- Plant breeding
- Induced mutation by radiation and chemical mutagen
- Radiation induction for genetic diversity of flower and ornamental plants
- Cytogenetic and molecular techniques for plant breeding



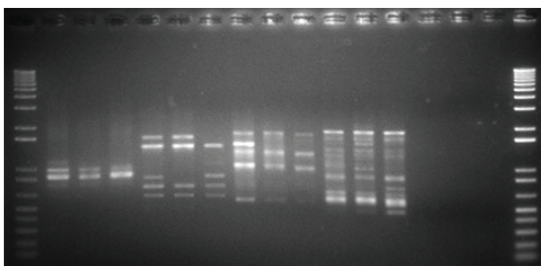
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# Asst. Prof. Ridthee Meesat

**Department of Applied Radiation and Isotopes**

E-mail: fscirim@ku.ac.th

## Keywords

Gene editing, Genetic engineering, Plant cell wall, Crops, Cassava, Polysaccharides

## Research Focus

Radiation dosimetry, Radiation chemical dosimetry and applications, radiochromic dosimetry, Radiation chemistry, Nanoparticle radiation synthesis, Nuclear and radiation analytical techniques.



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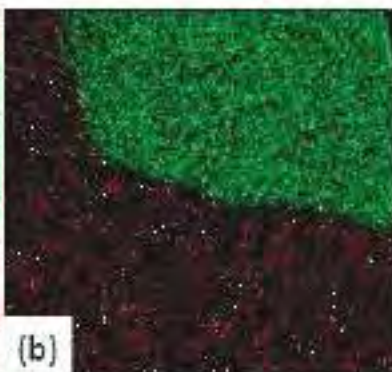
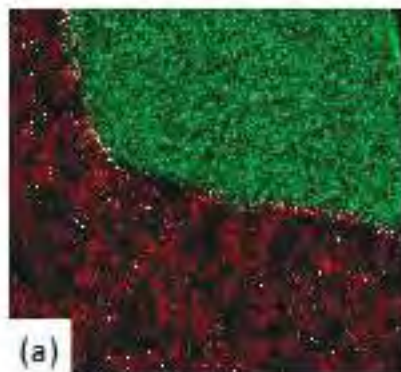
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Radiochromic dosimeter extracted from a plant



Gold-nanoparticle synthesis



Ion beam analysis of Cu, P, and Hg distribution in a tooth sample



# Dr. Somchit Palakas

Department of Applied Radiation and Isotopes

E-mail: somchit.p@ku.th

## Keywords

Xenobiotic Detoxification and cytotoxic assay for Drug Discovery, agricultural and agro-industrial residues utilization, Microbial Strain Improvement



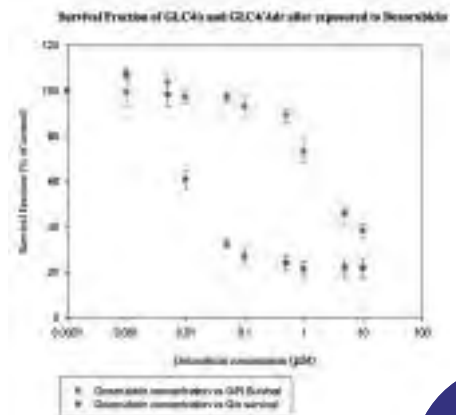
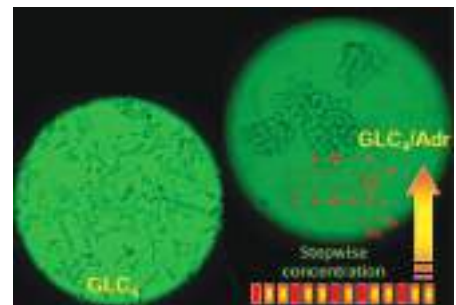
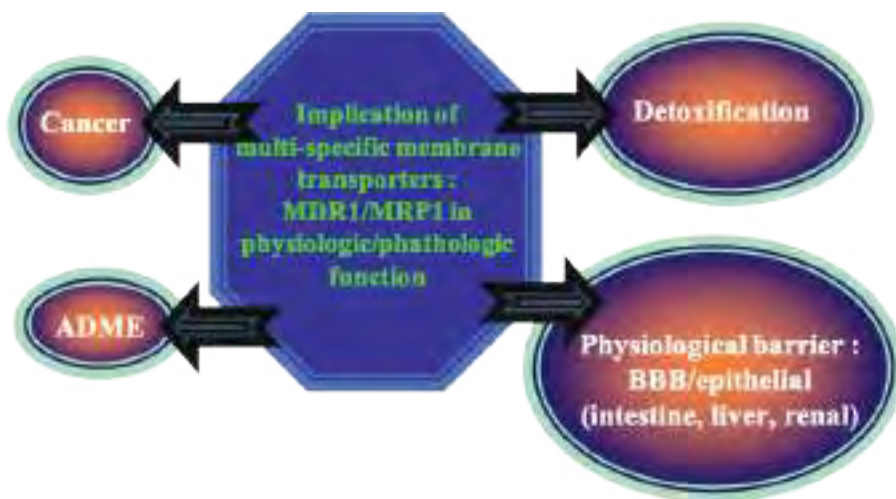
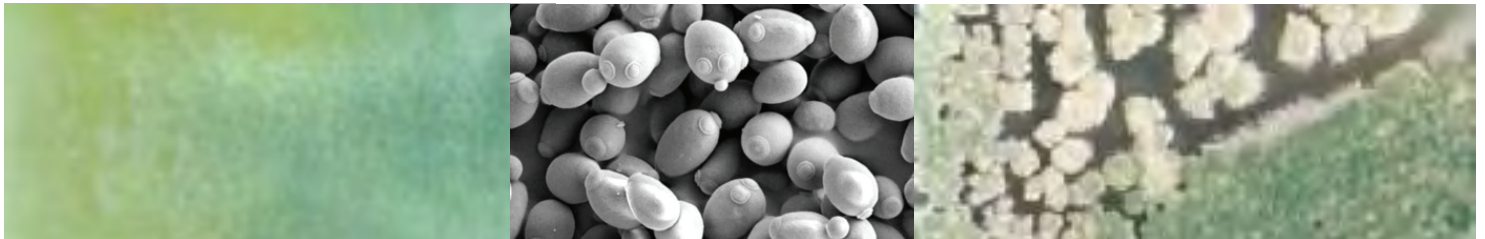
572072035511



0000-0002-1362-2971

## Research Focuses

- Xenobiotic detoxification by transmembrane transporter protein and cytotoxic assay for drug screening
- Enhancement of resource utilization and value adding of agricultural and agro-industrial residues through bioprocess to support sustainable development
- Microbial strain improvement through induced mutation for specific bioproducts





# Prof. Dr. Vasakorn Bullangpoti

Department of Genetics

E-mail: fscivkb@ku.ac.th

## Keywords

Botanical pesticides, Insect Toxicology, Pest Control



16303191000



000-0001-9192-6375



## Research Focus

My research seeks to provide innovative pest and disease management methods by biopesticide agents (mainly focus on plant allelochemicals) that can reduce the use of synthetic pesticides while still providing long-term control.

Targets mostly focus on pests attacking field crop and/or human health.



# 6

## INNOVATIVE HEALTH AND BIOMEDICAL RESEARCH



## INNOVATIVE HEALTH AND BIOMEDICAL RESEARCH

At the Faculty of Science, Kasetsart University, our innovative health and biomedical research tackles critical health challenges through advanced technologies. We excel in protein engineering, computer-aided drug discovery, and biosensor development for detecting allergies and ensuring food safety. Our work on biomaterials and tissue engineering focuses on peptides and the extracellular matrix.

Our cardiovascular research includes biosensors and heart failure test kits. We explore bioinorganic chemistry and antibiotic drug screening, combating infectious diseases. Our computational biology and bioinformatics expertise aids in understanding host-pathogen interactions and developing treatments for malaria and other mosquito-borne diseases.

We prioritize sustainable, bio-based materials and microbial enzymes for bioremediation and cosmeceuticals. Our xenobiotic detoxification and cytotoxic assays for drug discovery enhance the utilization of agricultural residues. Our interdisciplinary approach promises groundbreaking advancements in health and biomedical sciences, paving the way for a healthier future.



# Asst. Prof. Chomdao Sinthuvanich

Department of Biochemistry

E-mail: fscicds@ku.ac.th

## Keywords

Allergy, Food safety, Biomaterials, Peptides, Extracellular matrix, Tissue engineering



572072035511



0000-0002-1362-2971



Research field: Food safety, protein allergens and Biomaterials for medical applications

- Identifying IgE-binding epitopes of protein allergens and their cross reactivity
- Studying Allergen protein in seafood, edible insects, house dust mites, pollen
- Investigating food safety of edible insect: cricket and silkworm

Biomaterials for medical applications

- Development of nanoparticles from drug delivery
- Improving Cellular Response of Biomaterials through Peptide Functionalization
- Applications in stem cells, bone and cartilage regeneration

Research Techniques

- Identification of metabolites and peptides using HPLC and HPLC/MS
- Protein allergen: SDA-PAGE, ELISA, Western blot, degranulation assay
- Peptide synthesis, purification and conjugation
- Cytotoxicity assay, cell adhesion and proliferation assay, cellular mineralization
- Molecular Biology: RACE-PCR, Cloning, qPCR

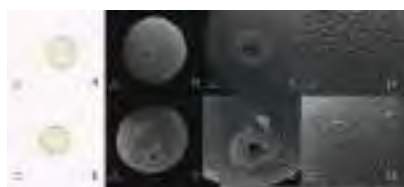
Crustacean



Edible cricket



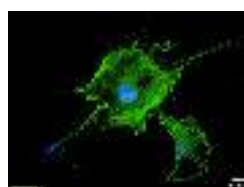
Pollen



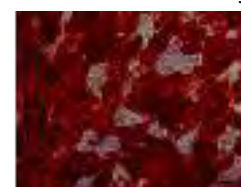
Cell proliferation



Cell adhesion



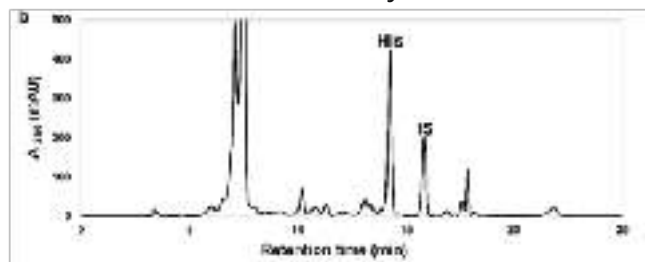
Mineralization assay



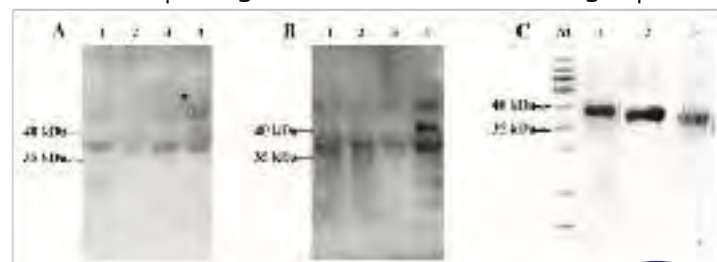
Degranulation assay



Identification of Histamine by HPLC



Western blot probing with volunteers' sera for allergen proteins





# Assoc. Prof. Kiattawe Choowongkamon

Department of Biochemistry

E-mail: fsciktc@ku.ac.th

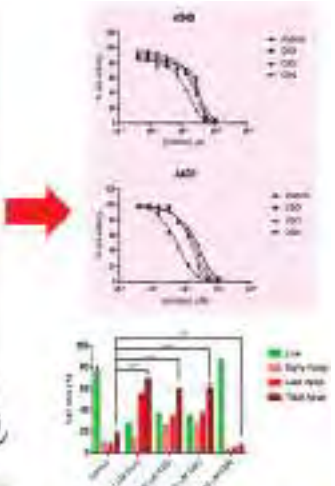
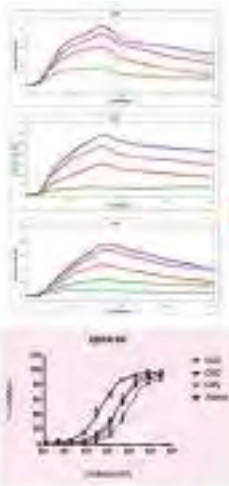
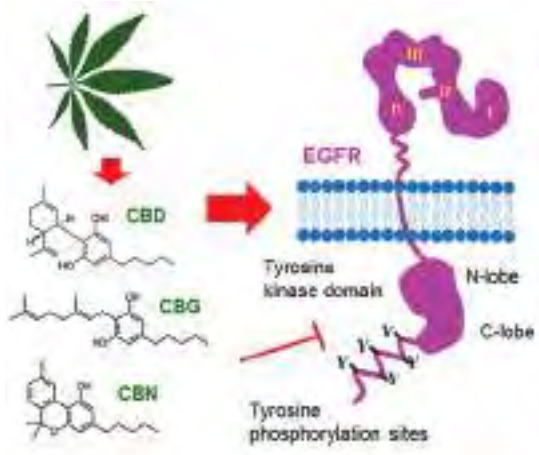
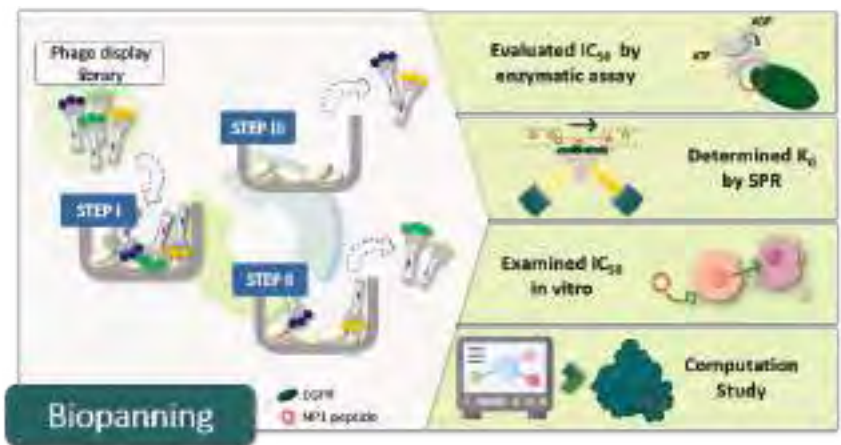
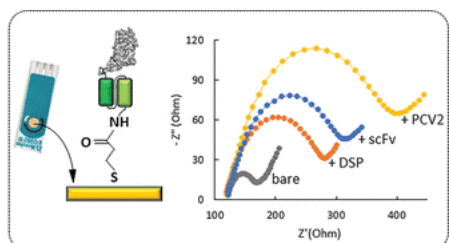
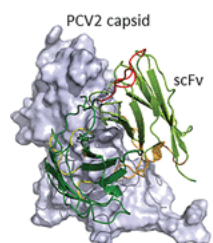
## Keywords

Protein Engineering, Protein Modeling, Computer-aided drug discovery, Biosensor

Research field : Protein Biochemistry; Biosensor; Drug Discovery

6506273203

0000-0002-2421-7859



Cannabinoids EGFR-Tyrosine kinase binding and inhibition Molecular docking and dynamics simulation Anticancer activity



# Asst. Prof. Napachanok Swainson

Department of Biochemistry

E-mail: fscinm@ku.ac.th

## Keywords

Cardiovascular disease, Endothelial cell function, Biosensor, Heart failure test kit+

Research interest:

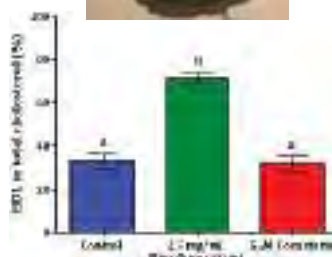
- Phytochemicals reduce plasma cholesterol and reverse endothelial dysfunction, the cause of cardiovascular disease.
- Development of biosensors using laboratory-selected recognition unit, scFv



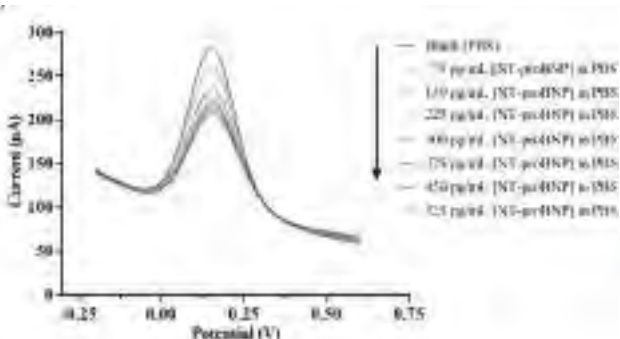
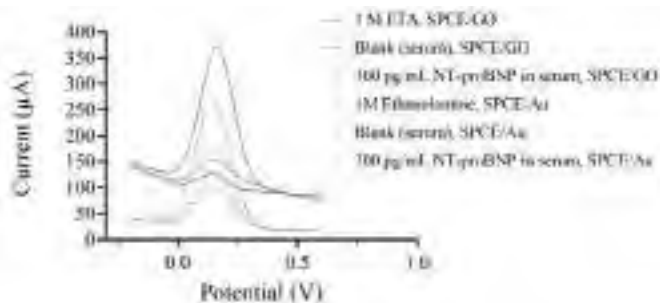
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0000-0001-6005-4316



Mycelial extract increased HDL in 3-D liver cell model. *Scientific reports (2023) 13:13619*



Electrochemical-biosensor for the diagnosis of chronic and acute heart failures; NT-proBNP detection *Heliyon (2023) 9: e19710 and ASEP (2024) 17: 7004*

Reversion of hyperglycemia-induced endothelial dysfunction by mycelial extract

- eNOS/iNOS
- LDL-uptake





# Assoc. Prof. Nattanan Panjaworayan T-Thienprasert

Department of Biochemistry

E-mail: fscinnp@ku.ac.th

## Keywords

Key word: Medical Biochemistry, ZnO NPs biosynthesis, Molecular Biology, Cellular Biology

Research focus :

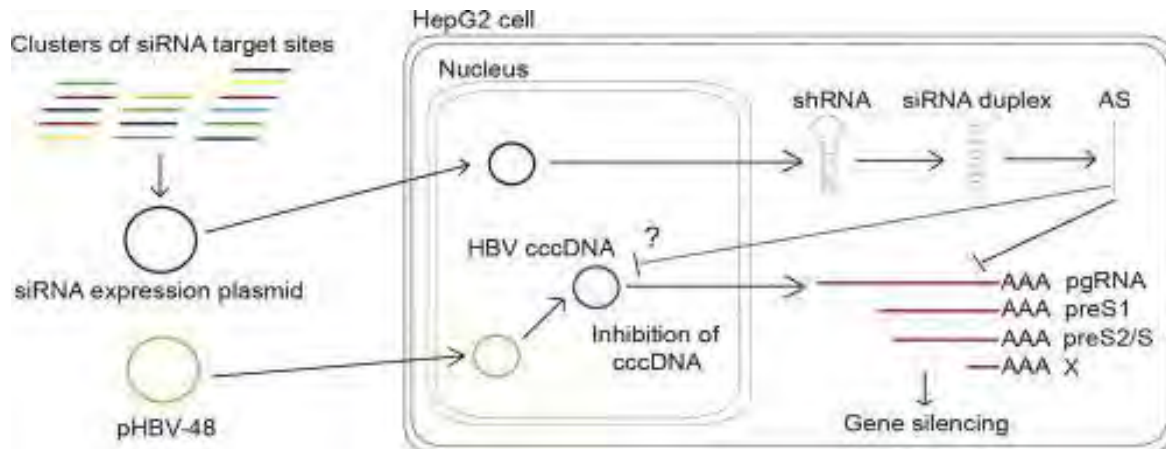
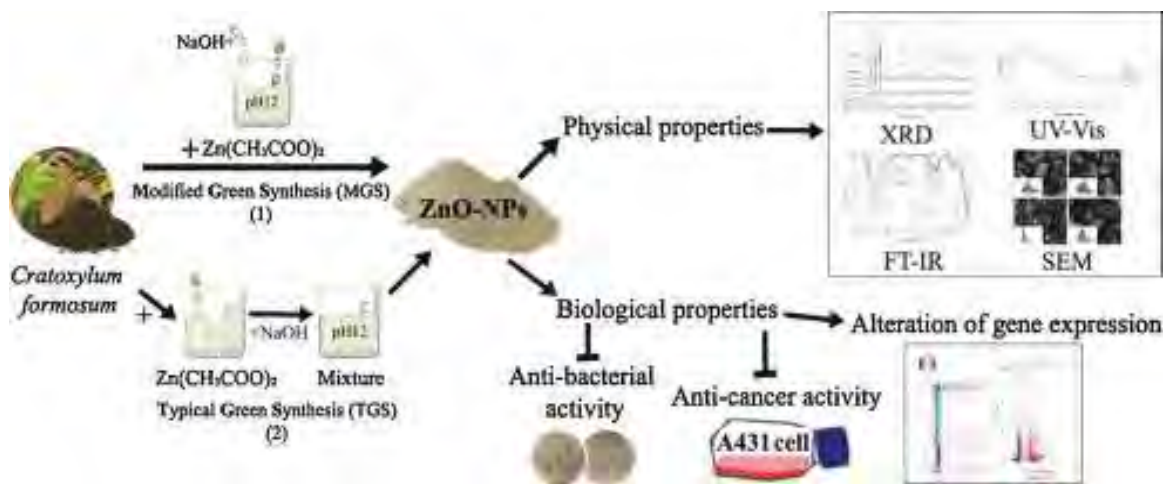
- Biosynthesis of nanoparticles for green agriculture and medical applications
- Evaluating the effects of natural products on the gene expression of cancer cells and pathogenic bacteria
- RNAi technology



57728750500



0000-0003-3520-8330





# Asst. Prof. Pichamon Kiatwuthinon

Department of Biochemistry

E-mail: fscipmk@ku.ac.th

## Keywords

3D culture, Cell adhesion-mediated drug resistance, Transcriptomics



26534489200

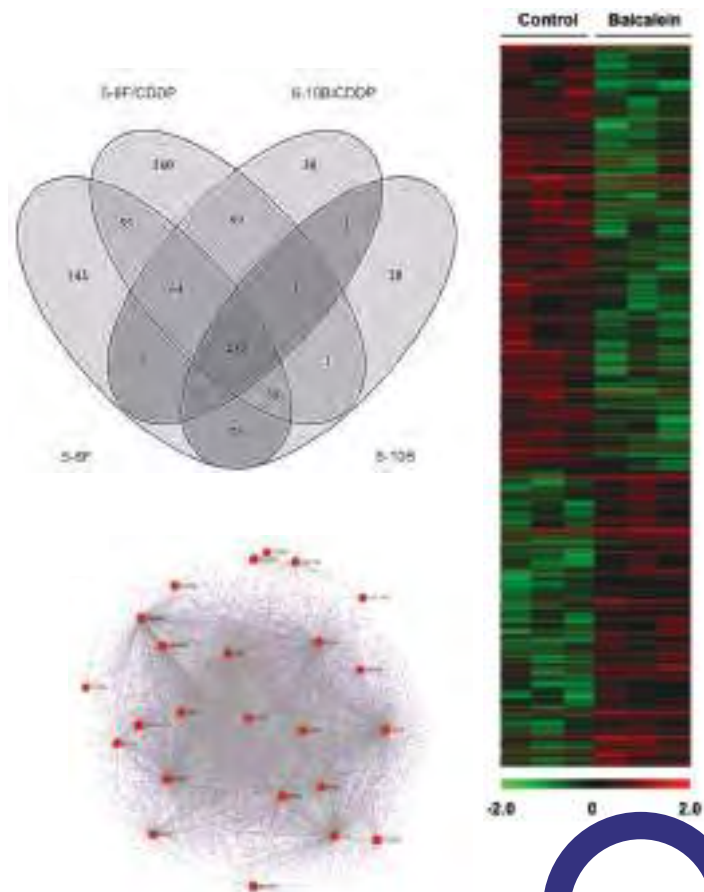
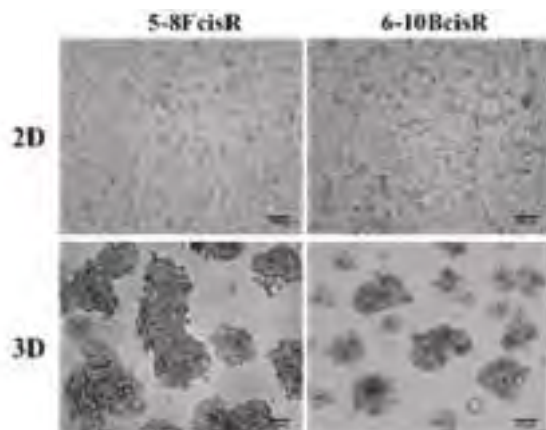
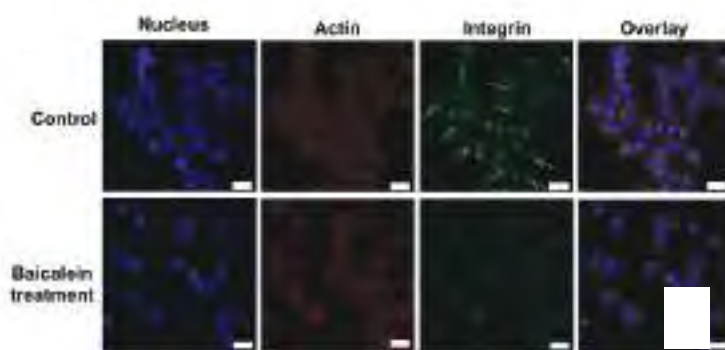


0000-0002-6806-9261



Research field: Molecular biology of cancers, Biomaterials for biomedical and cultured meat applications, and deciphering molecular mechanisms by -omics.

- Molecular biology of cancers: Mechanisms contributing to cancer metastasis, and drug resistance
- Biomaterials for biomedical and cultured meat applications: Characterization of osteogenic phenotypes of cells cultured on different modified hydroxyapatite materials and synthesis of scaffolds for cultivated meat application
- Deciphering molecular mechanisms by -omics : Investigation of the transcriptomes and proteomics of cancers and yeast cells to reveal associated molecular mechanisms





# Asst. Prof. Suttida Chukiatsiri

Department of Biochemistry

E-mail: fscistd@ku.ac.th

## Keywords

Inflammatory diseases, Anti-diabetic study

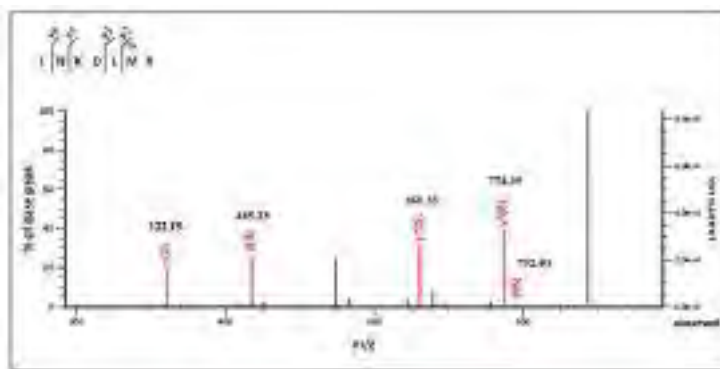
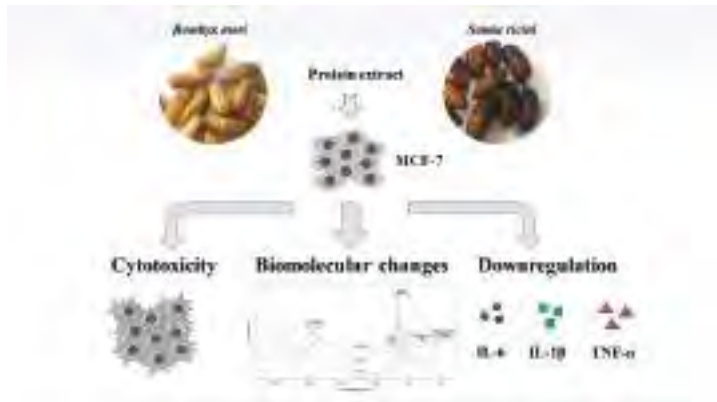
Research field: Anti-diabetic study, Inflammatory diseases, Peptide purification and identification



57216954429



0000-0002-1436-8055





# Dr. Tuangtong Vongpipatana

Department of Biochemistry

E-mail: tungtong@ku.th

## Keywords

Macrophage, anti-inflammation, Plant extract



56287611400



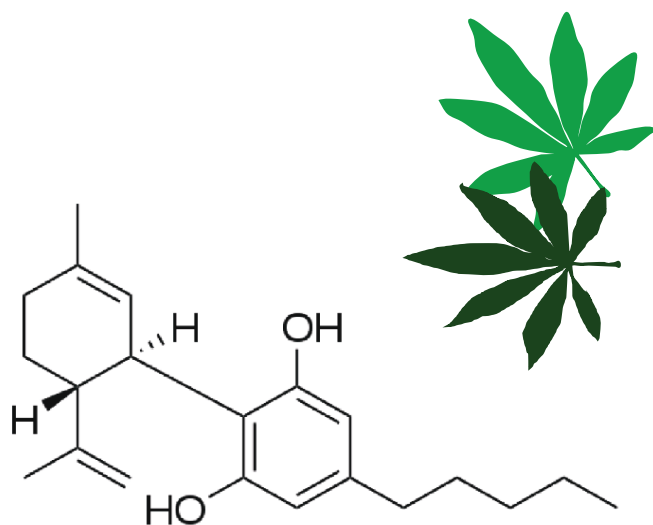
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Research field: Medical Biochemistry,  
Molecular Biology, Immunology

Research interest

- Effect of cannabidiol on functions of M1-macrophages in high glucose condition
- Anti-inflammatory effect of *Cratoxylum formosum* extract on Lipopolysaccharide-Induced macrophages
- Molecular mechanism of Botulinum toxin injection for muscle spasms treatment



Cannabidiol (CBD)



*Cratoxylum formosum*



# Dr. Akkharadet Piyasaengthong

## The International Undergraduate Program in Bioscience and Technology

E-mail: fsciadp@ku.ac.th

### Keywords

Bioinorganic chemistry, Antibiotic drug screening, Organometallic Chemistry



56731103000



0000-0001-9253-3514



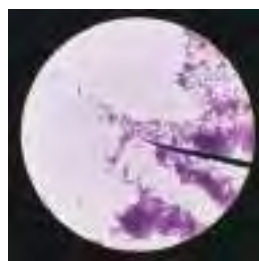
### Research Focuses

- Antibiotic drug screening :  
Study the Thai herbal extracts against normal and antibiotic-resistant Cutibacterium acnes
- Advancements in Organometallic Chemistry:  
Design and Synthesis of Innovative Ruthenium and Gold-Based Heterogeneous Catalysts

Antibiotic drug screening



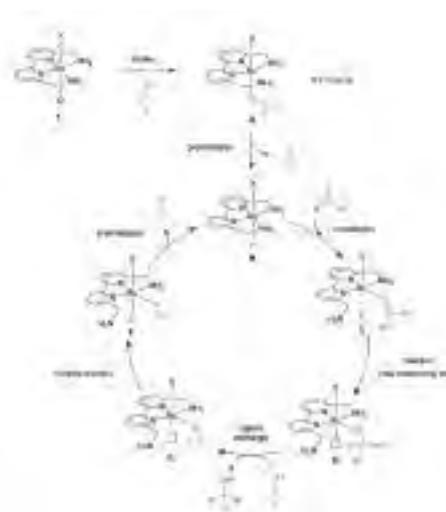
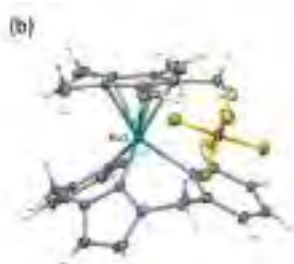
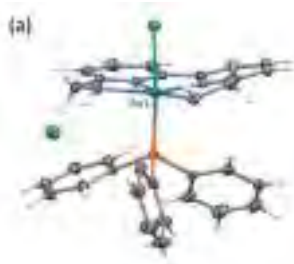
MIC



MBC



Advancements in Organometallic Chemistry





# Assoc. Prof. Chalernpol Suwanphakdee

Department of Botany

E-mail: fscicps@ku.ac.th

## Keywords

*Nymphoides*, Piperaceae, Pollen Allergy, Piper extract, Tropical plants, *Thunbergia*, *Viola*



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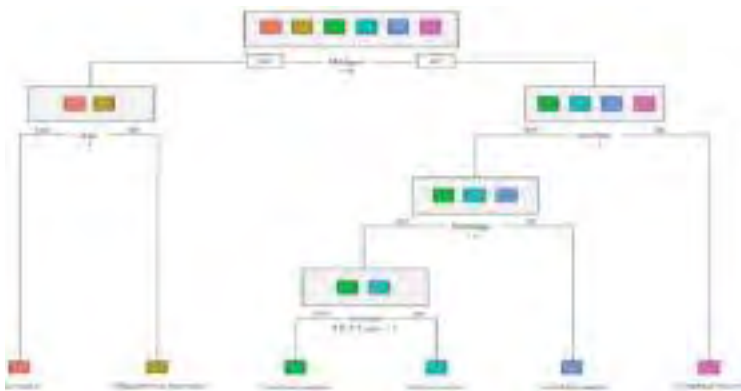
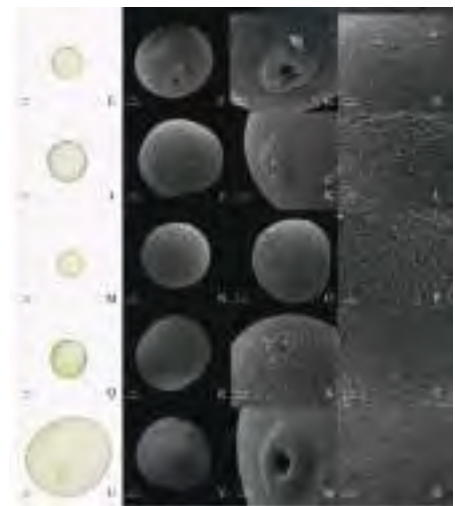


0000-0002-9167-1840



Research fields: Plant taxonomy, Palynology, Molecular Systematics, Biodiversity

- Piperaceae in Thailand. *Thunbergia* (Acanthaceae) in Thailand. Pollen allergy in Thailand. Disporopsis in Thailand
- Grass pollen quality control for allergy test kit production using pollen morphological characters.
- Assessment of Morphological, Anatomical and Palynological Variation in the Medicinal Plant *Disporopsis longifolia* Craib (Asparagaceae) for Botanical Quality Control
- Piperaceos plant extracts against parthenogenesis. Qualification control of honey using melliferous plants.





# Assoc. Prof. Patchareenart Saparpakorn

Department of Chemistry

E-mail: fscipnsk@ku.ac.th, patchreenart.s@ku.th

## Keywords

*Nymphoides*, Piperaceae, Pollen Allergy, Piper extract, Tropical plants, *Thunbergia*, *Viola*



8505160900



0000-0001-7980-1473

## 1. Computer-Aided Molecular Design

Protein-Ligand binding interaction



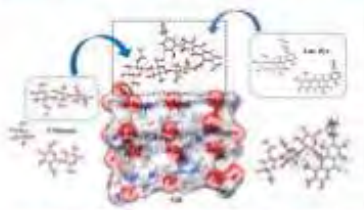
Chem. Biol. Interact. 2021, 344, 109523



Chem. Biol. Interact. 2022, 368, 110227

## 2. Natural product database

Herbs in Thai Traditional Medicine Formulary



J. Mol. Graph. 2021, 106, 107934



Mol. Simul. 2022, 48, 463-476



# Assoc. Prof. Prapasiri Pongprayoon

Department of Chemistry

E-mail: fsciprpo@ku.ac.th

## Keywords

Albumins, miRNA, MD simulations,  
Chicken, Diabetes, Herbs



35387039800

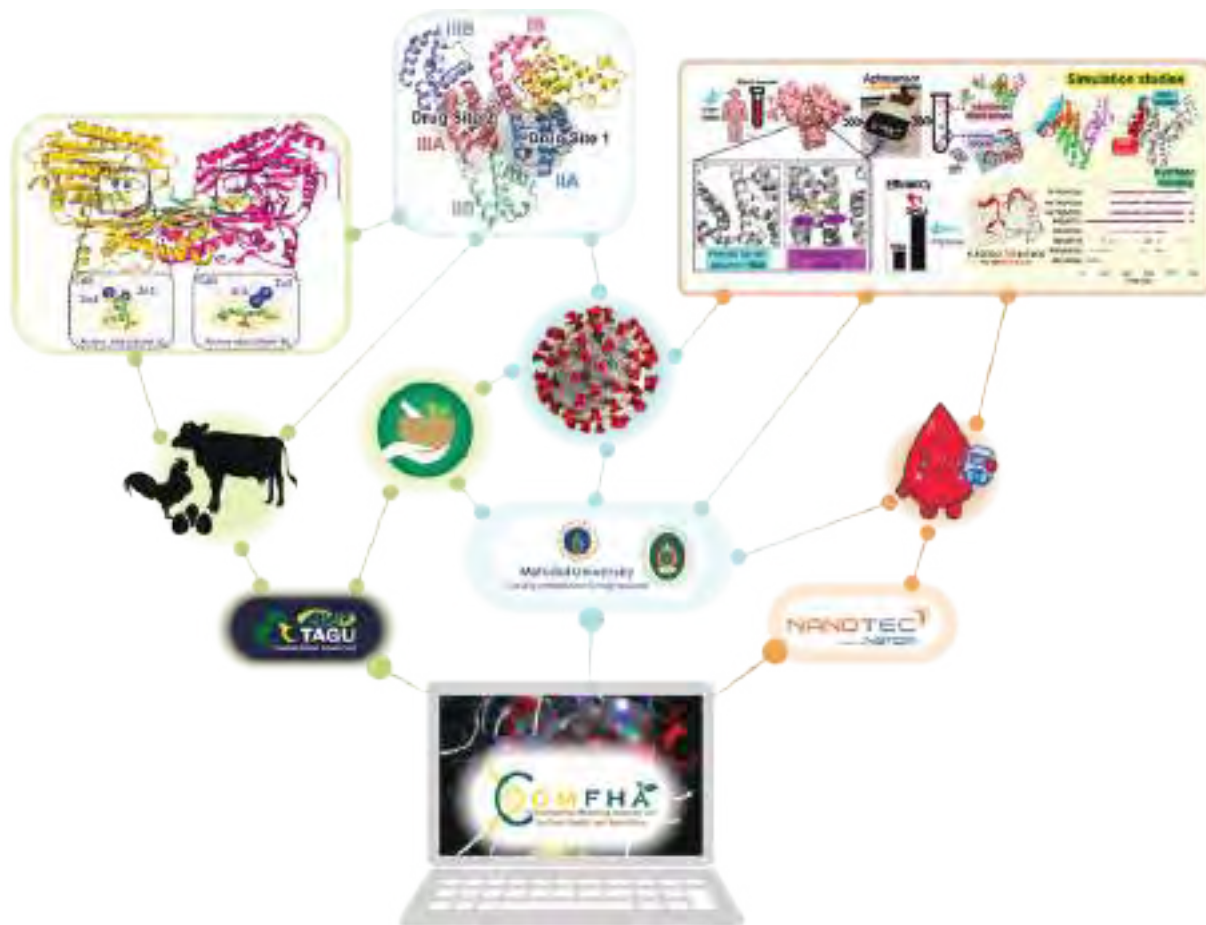


0000-0002-1472-8241



## Research topics:

- Modelling of graphere-based aptasensor
- Modelling of food and agriculture-related proteins
- Simulations of membrane proteins
- Simulations of bacterial membrane systems
- Simulations of nanopores







# Prof. Supa Hannongbua

Department of Chemistry

E-mail: fscisph@ku.ac.th

## Keywords

Computer-Aided Molecular Design, Molecular Modeling, QSAR, Cheminformatics, Drug Design

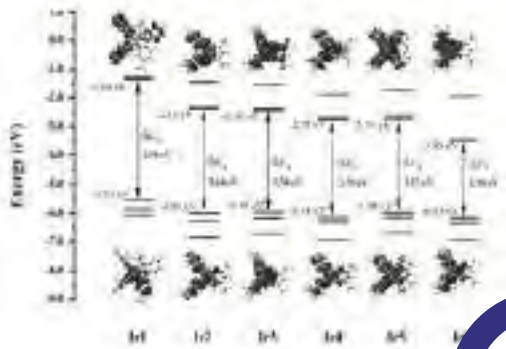
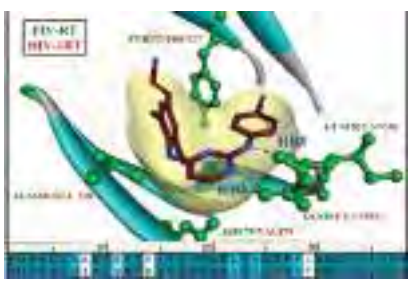
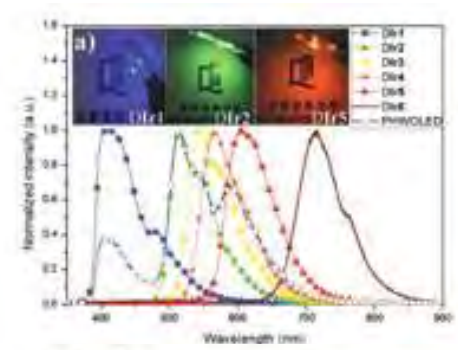
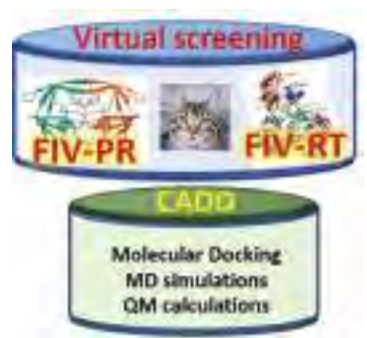
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0000-0002-9901-4466



## Research field:

- Drug discovery research focuses on anti-HIV, anti-Dengue, anti-Alzheimer's disease, Antibiotics, etc. **Computational Drug Discovery platform** includes 2D- and 3D-QSAR, quantum chemical calculations, virtual screening, de novo design, combinatorial library design, Cheminformatics and database of Natural Products, protein-ligand interaction simulations and ADME/T prediction.
- **Biological-physicochemical experimental platform** to verify and realize the computational design based on several biophysical technologies, such as enzyme assay, X-ray crystallographic and NMR spectroscopic studies on enzymes, enzyme kinetics study
- SDevelopment of Structure and Electronic properties of Materials: Fluoro-energy transfer materials, Advanced Functional and Optical materials.





# Assoc. Prof. Thitinun Karpkird

Department of Chemistry

E-mail: fscitnm@ku.ac.th

## Keywords

Drug delivery, Cyclodextrin, Encapsulation

Research field:

Nanoparticle encapsulation for drug and cosmetic applications

- Design and functional group modification of the encapsulation systems from biocompatible polymers
- Control-release study of drugs or active compounds
- Encapsulation of anti-aging agents, whitening agents, antioxidants

Insect repellent from natural products

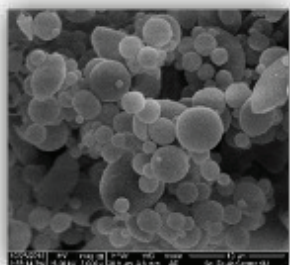
- Development of mosquito repellent formulations



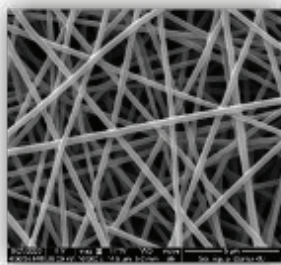
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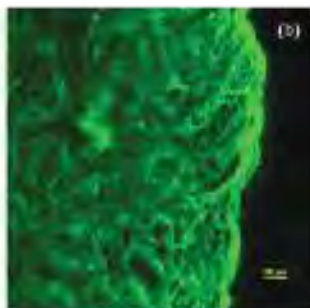
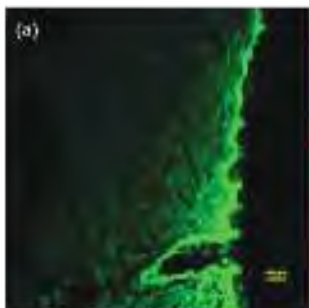
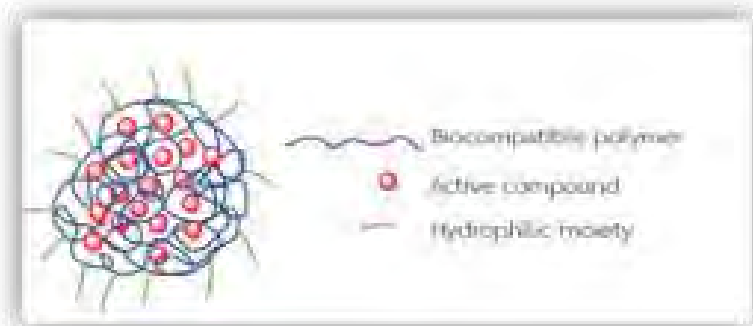
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nanoparticles



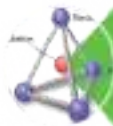
nanofibers



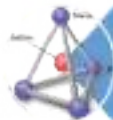
increasing of skin permeation



Increase the stability and solubility



Enhance delivery to target cells increasing the efficiency



Safe and biocompatible



# Assoc. Prof. Wanchai Pluempunupat

Department of Chemistry  
Special Research Unit for Advanced Magnetic Resonance

## Keywords

Drug delivery, Botanical insecticide, Medicinal compound, Drug discovery, encapsulation

Research field:

- Searching for new botanical insecticides & medicines



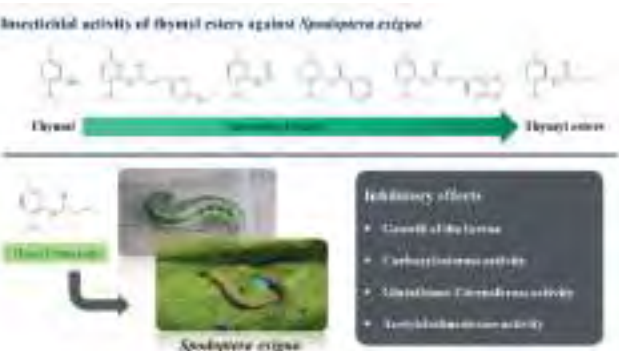
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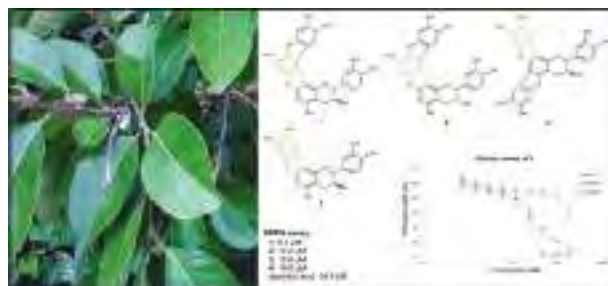
- Structural modification of bioactive compounds



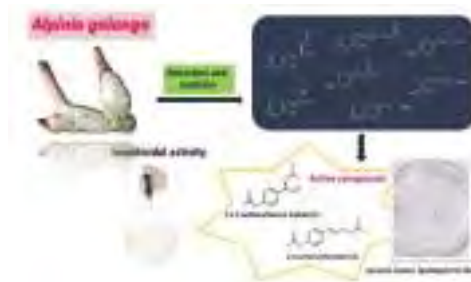
*Pest Manag. Sci.*, 2022, 78, 684-691



*Molecules*, 2022, 27, 5176



*Molecules*, 2021, 26, 1078



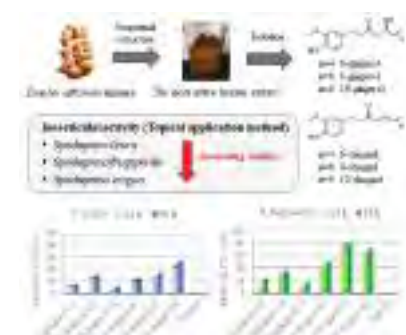
*Nat. Prod. Res.*, 2023, 37, 669-674



*Pest Manag. Sci.*, 2020, 76, 928-935



*ChemistrySelect*, 2023, 8(46), e202303879



*Nat. Prod. Res.*, 2021, 35, 5261-5265



# Dr. Wannisa Sukjee

Department of Chemistry

E-mail: fsciwisu@ku.ac.th

## Keywords

Biosensor, Electrochemical sensor, Molecularly Imprinted Polymers (MIPs)



56741551800

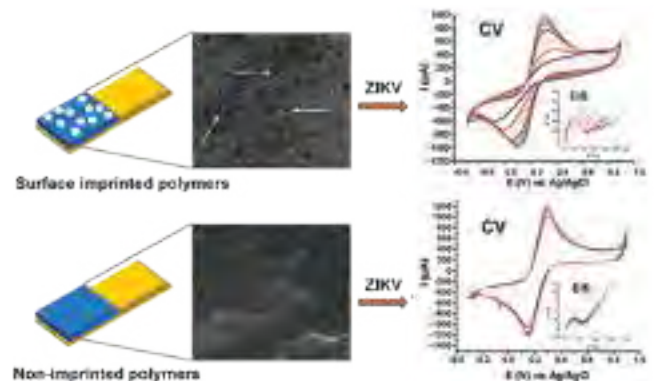
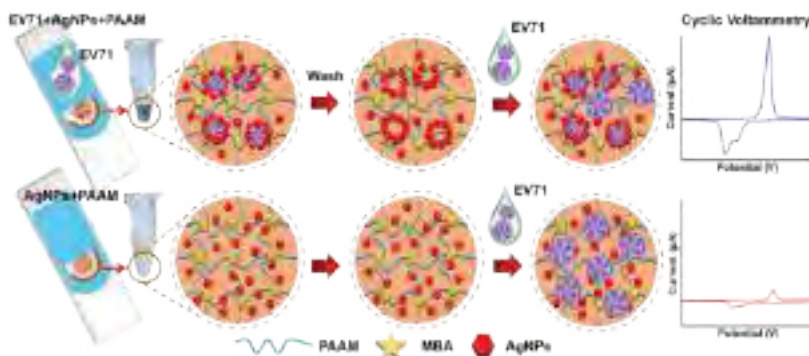
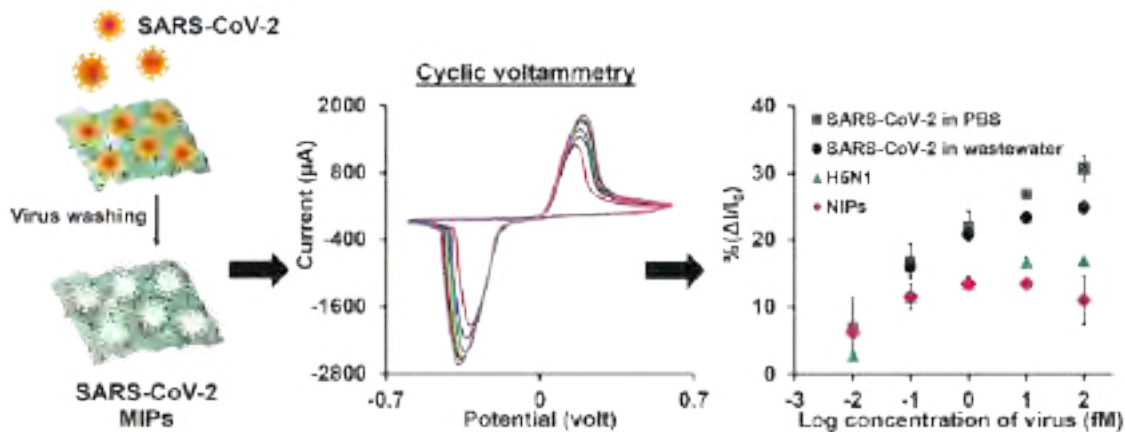


0000-0003-1250-0451



Research field:

- EV71 virus induced silver nanoparticles self-assembly in polymer composites with an application as virus biosensor
- Virus MIP-composites for SARS-CoV-2 detection in the aquatic environment
- Electrochemical Biosensor Based on Surface Imprinting for Zika Virus Detection in Serum





# Asst. Prof. Witcha Imaram

Department of Chemistry

E-mail: witcha.i@ku.th

## Keywords

Metabolomics, Drug delivery, Antimalarial, EPR spin trapping



23050850100

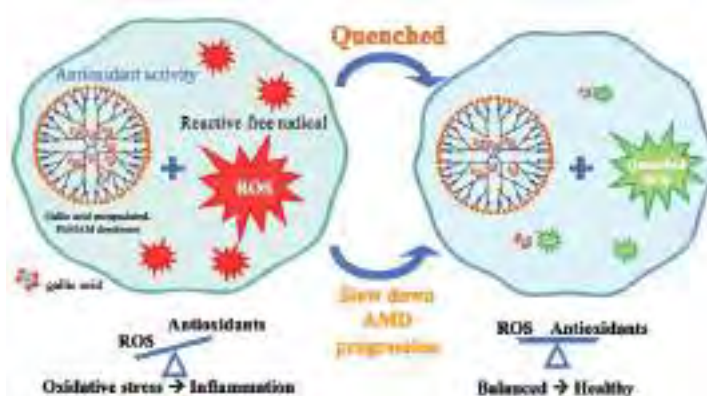


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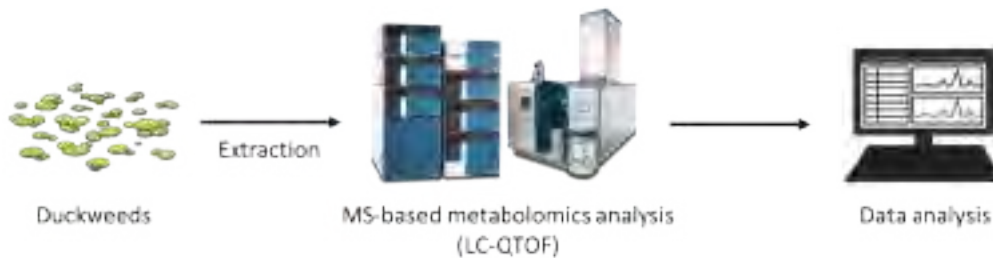


Research field:

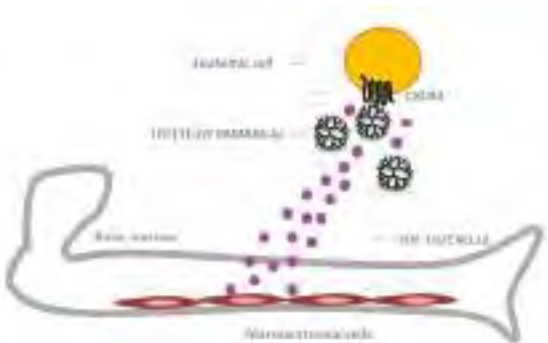
- Gallic Acid Encapsulated PAMAM Dendrimers: A Promising Antioxidant Delivery System for Controlled Release and Reduced Toxicity



- MS-based metabolomics



- Synthesis of targeted dendrimer and its activities against cancer cells



- Cationic Naphthoquinone Aliphatic Ester: a new class of antimalarial compound



# Assoc. Prof. Anchanee Kubera

Department of Genetics

E-mail: fscislk@ku.ac.th

## Keywords

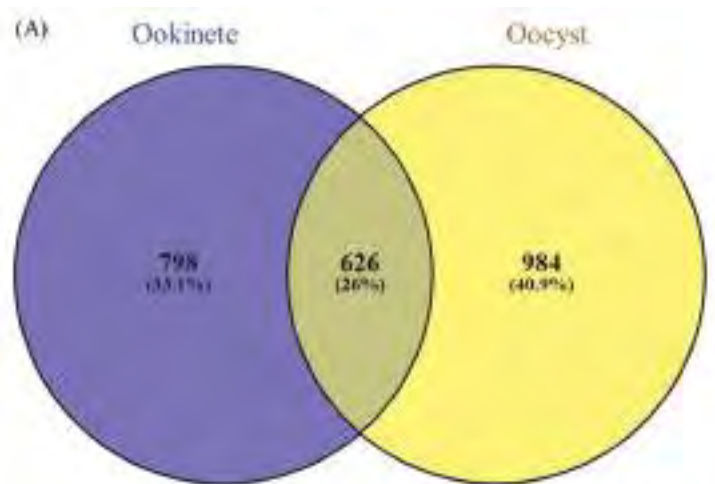
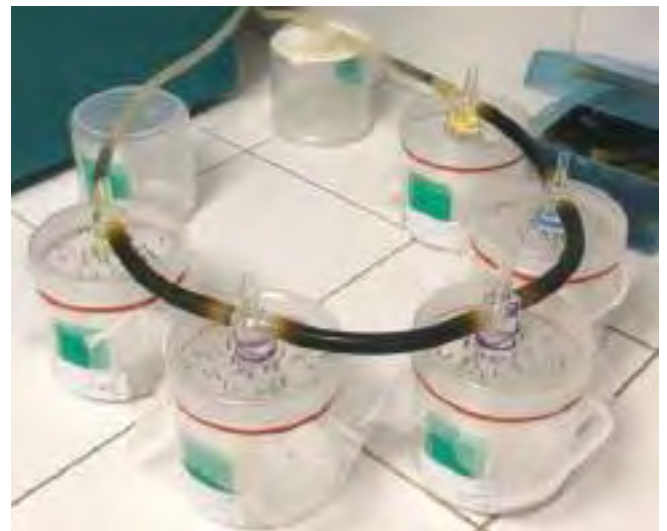
Host-pathogen interactions, malaria, silkworm

## Research Focuses

- Transcriptome profiles of Anopheles and Plasmodium
- Odorant receptors of *Bombyx mori*



0000-0002-5236-8048





# Asst. Prof. Teerasak E-kobon

Department of Genetics

E-mail: fscitse@ku.ac.th

## Keywords

Bioinformatics, Computational Biology, Omics of Animal and Human Infectious Diseases, Gastropod Mucus Application

## Research Focus:

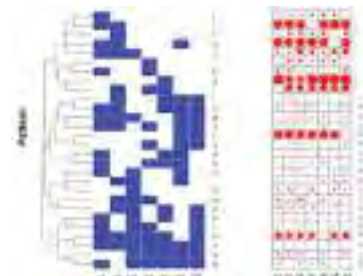
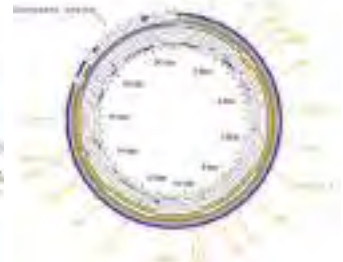
- Development of tools and workflows for Omics data analysis
- Utilization of microbial Omics data for disease monitoring and treatment
- Gastropod functional genomic exploration for commercial application



56692918900



0000-0002-3919-9841





# Assoc. Prof. Uraiwan Arunyawat

Department of Genetics

E-mail: fsciuwa@ku.ac.th

## Keywords

Mosquito-borne disease, Malaria vector diversity, Population genetics and Evolution



22833242100



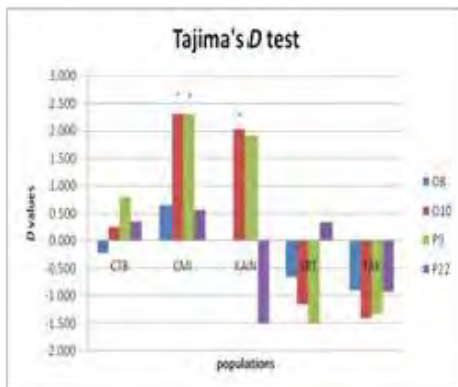
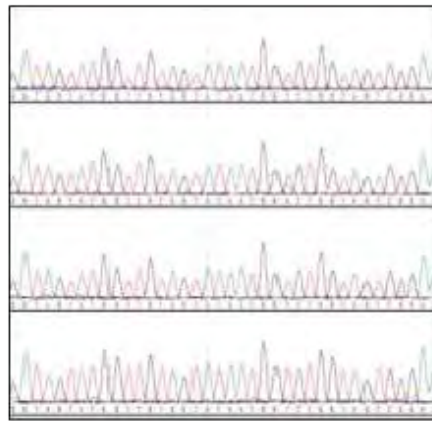
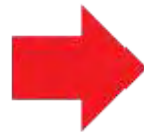
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## Research Focuses

- My main research interest is to understand evolutionary aspects of mosquito-borne diseases, using genetic data and statistical analyses of population genetic models, to achieve an effective vector-borne disease control program.

My current research projects focus on species identification of simian malaria mosquito vectors in Thailand, and the impacts of climate change to mosquito adaptation.







# Assoc. Prof. Decha Dechtrirat

Department of Materials Science

E-mail: fscidcd@ku.ac.th

## Keywords

Sustainable materials, Bio-based materials, Biomimetic materials, Biosensors



36015206500



0000-0002-6651-5870

## Research Areas:

- Nanomaterials in sensors and medical diagnosis (i.e. point-of-care testing/POCT, test kits, test sticks)
- Fibrous and Porous materials for industrial applications
- Sustainable materials for environmental applications
- SBio-based materials for medical applications



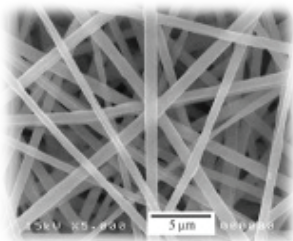
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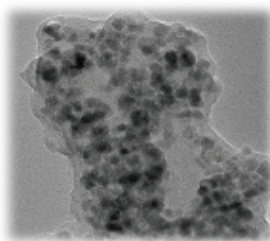
"Test kits"



"Test sticks"



"Nanofiber"



"MNP/carbon composite"



"Magnetic carbon"



"Wound dressing"



"Plant extracts"



"Tissue scaffold"



# Asst. Prof. Churapa Teerapatsakul

Department of Microbiology

E-mail : fscipt@ku.ac.th

## Keywords

Bioremediation, Cosmeceutical, Enzyme Technology, Microbial Enzyme, Mushroom



22136652100

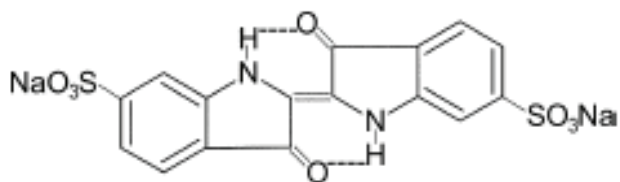
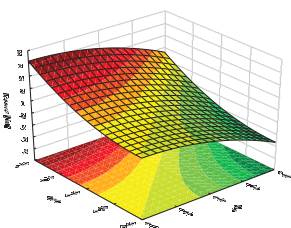
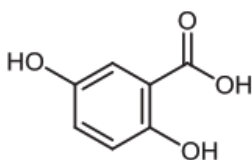
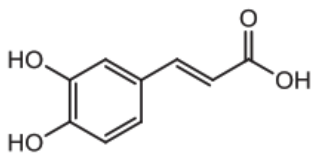


0009-0002-5910-5416



Research field:

- : Bioactive Compounds of Mushroom
  - Anti-aging, anti-inflammatory, antimicrobial properties
  - Application for bio-products: functional foods, nutricosmetic, cosmeceutical products
- : Microbial Enzyme
  - Predictive enzyme production
  - Purification & characterization of enzyme
- : Enzyme Technology
  - Biotechnological use of free or immobilized enzyme
- : Bioremediation by fungal cell system
  - Green process to remove toxic substances



Indigo Carmine (IC)



Dye decolorization by fungal enzyme





# Assoc. Prof. Ingorn Kimkong

Department of Microbiology

E-mail : fsciok@ku.ac.th

## Keywords

Hepatitis B virus, Hepatocellular carcinoma, Autophagy, N-linked glycosylation, Immunogenetics, Cancer, Anti-microbial, Anti-biofilm, Anti-cancer, Anti-oxidant, Infection, Infectious diseases, Immune responses



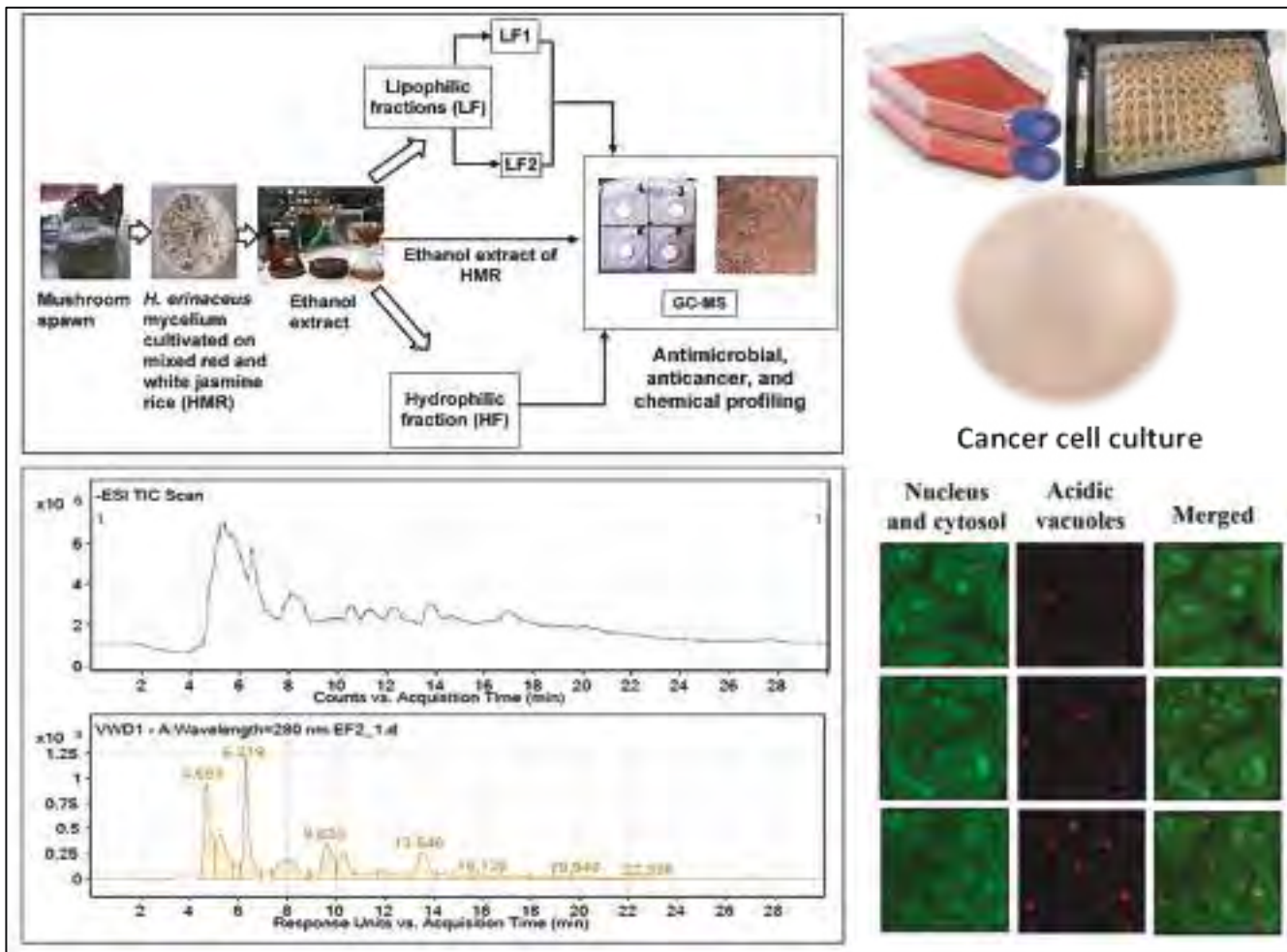
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0000-0002-8731-0356

## Research Areas:

- Immunogenetic study and molecular pathogenesis of hepatitis B virus infection and hepatocellular carcinoma
- Post-translational modification; N-linked glycosylation in hepatitis B virus life cycle, host responses and autophagy.
- The effect of mushroom/herb extracts in anti-microbial, anti-biofilm, anti-cancer, anti-oxidant activities and immune responses





# Asst. Prof. Jureeporn Chuerduangphui

Department of Microbiology

E-mail: fscijoc@ku.ac.th

## Keywords

Human papillomavirus, Herpes simplex virus, Cancer, Natural Product, Functional Food Product, Synergistic Agent



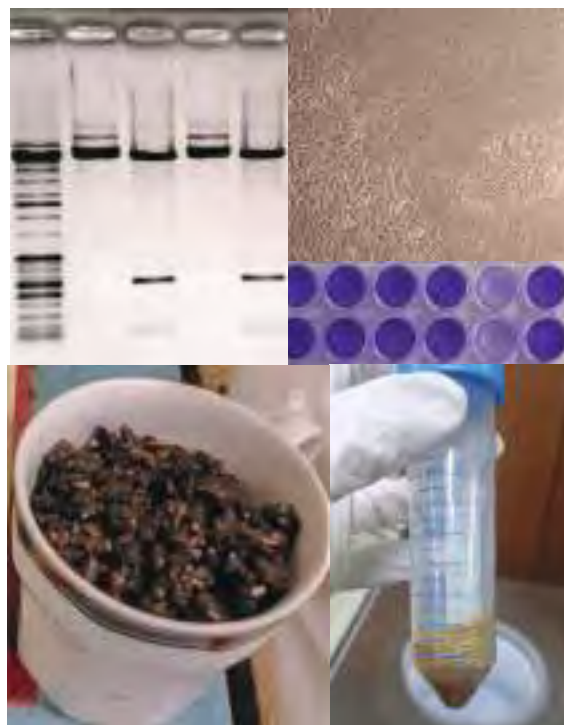
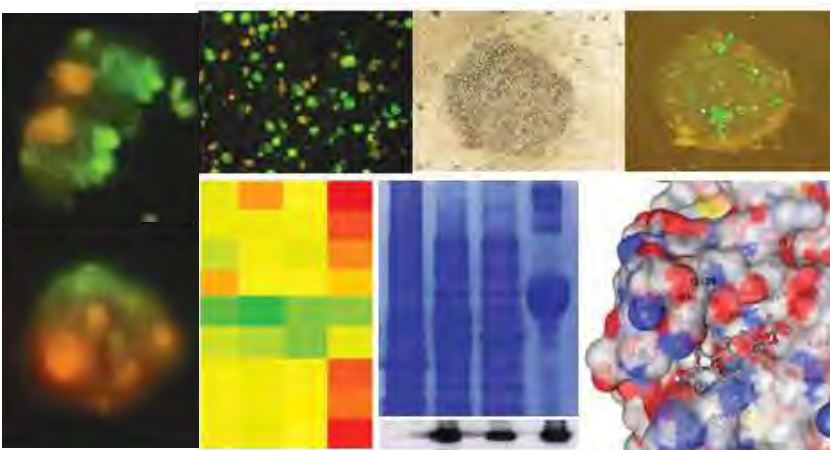
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0000-0002-7412-7050

## Research Focuses

- Screening of a bioactive compound on anti-human papillomavirus (HPV), anti-herpes simplex virus (HSV), anti-cervical cancer and anti-oral cancer
- Study of molecular mechanisms of a bioactive compound on anti-HPV, anti-HSV and anti-cancer
- Development of health food products synergistic compounds on anti-cancer and anti-viral activity.





# Dr. Somchit Palakas

Department of Applied Radiation and Isotopes

E-mail: somchit.p@ku.th

## Keywords

Xenobiotic Detoxification and cytotoxic assay for Drug Discovery, agricultural and agro-industrial residues utilization, Microbial Strain Improvement



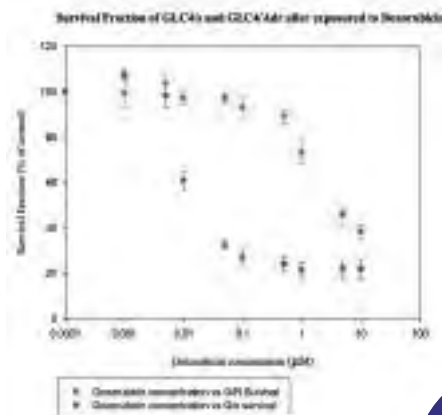
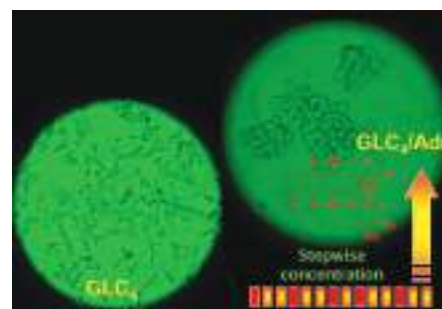
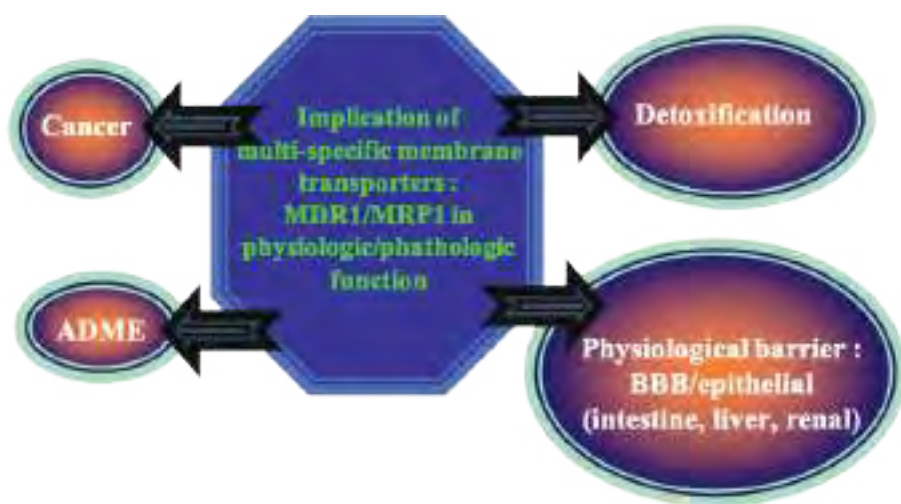
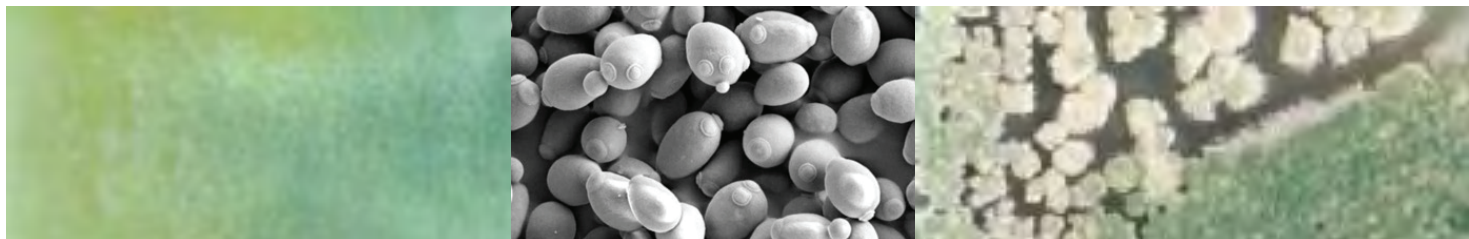
572072035511



0000-0002-1362-2971

## Research Focuses

- Xenobiotic detoxification by transmembrane transporter protein and cytotoxic assay for drug screening
- Enhancement of resource utilization and value adding of agricultural and agro-industrial residues through bioprocess to support sustainable development
- Microbial strain improvement through induced mutation for specific bioproducts





# Assoc. Prof. Pramote Chumnanpuen

Department of Zoology

E-mail: pramote.c@ku.th

## Keywords

Bioactive Peptides, Biomimetic Peptides, Systems Biology, Bioinformatics

Research focus:

Medical and Cosmetic applications of Biomimetic Peptides; Bioinformatics Prediction Tools and Pipeline for Functional Peptides Screening



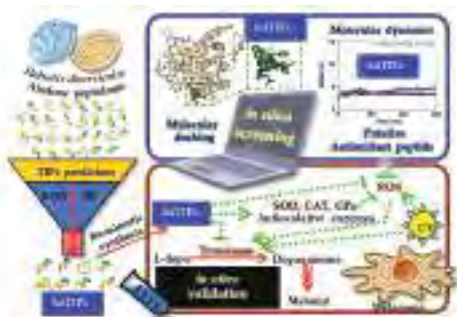
36871569000



0000-0003-3072-1733



**Biomimetic Anticancer peptides from Cordyceps fungus**



**Antimelanogenic and Tyrosinase inhibitory peptides from abalone, rice, and cannabis**

This block shows a grid of micrographs demonstrating the inhibitory effects of various peptides on tyrosinase activity. The peptides listed include: Control, TSP, TSP1, TSP2, TSP3, TSP4, TSP5, TSP6, TSP7, TSP8, TSP9, TSP10, TSP11, TSP12, TSP13, TSP14, TSP15, TSP16, TSP17, TSP18, TSP19, TSP20, TSP21, TSP22, TSP23, TSP24, TSP25, TSP26, TSP27, TSP28, TSP29, TSP30, TSP31, TSP32, TSP33, TSP34, TSP35, TSP36, TSP37, TSP38, TSP39, TSP40, TSP41, TSP42, TSP43, TSP44, TSP45, TSP46, TSP47, TSP48, TSP49, TSP50, TSP51, TSP52, TSP53, TSP54, TSP55, TSP56, TSP57, TSP58, TSP59, TSP60, TSP61, TSP62, TSP63, TSP64, TSP65, TSP66, TSP67, TSP68, TSP69, TSP70, TSP71, TSP72, TSP73, TSP74, TSP75, TSP76, TSP77, TSP78, TSP79, TSP80, TSP81, TSP82, TSP83, TSP84, TSP85, TSP86, TSP87, TSP88, TSP89, TSP90, TSP91, TSP92, TSP93, TSP94, TSP95, TSP96, TSP97, TSP98, TSP99, TSP100.

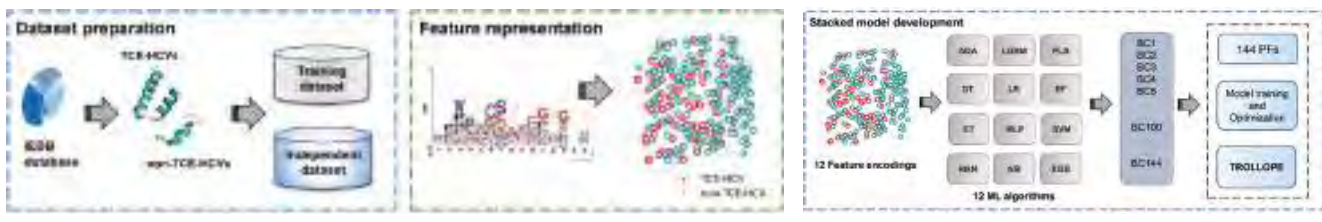
**Antimalarial peptides**  
**Antiviral peptides**

- SARS-CoV-2 Main Protease Inhibitor
- SARS-CoV-2 RdRp Inhibitors
- Hepatitis C vaccine

**Peptide-based therapy for autoimmune diseases**

**Web server development**

**Performance evaluation**





# Assoc. Prof. Wachiryah Thong-asa

Department of Zoology

E-mail: fsciwyth@ku.th

## Keywords

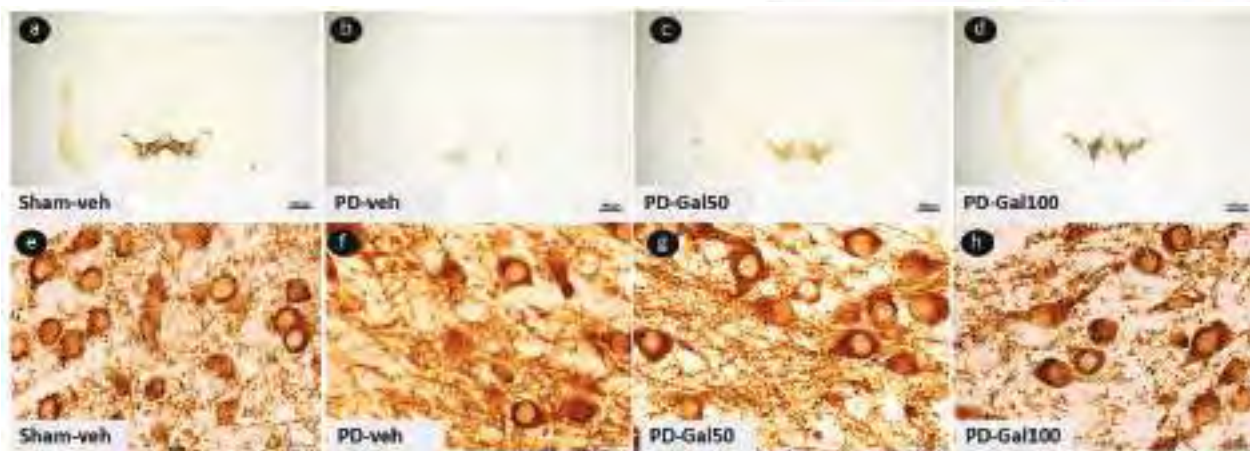
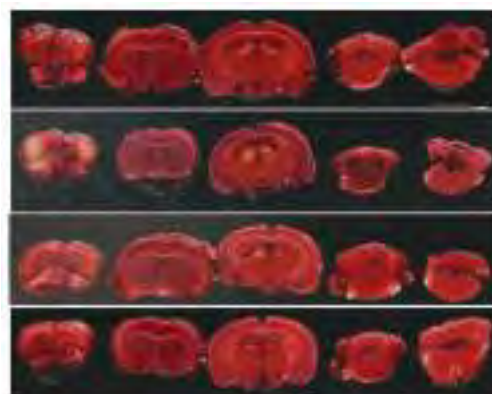
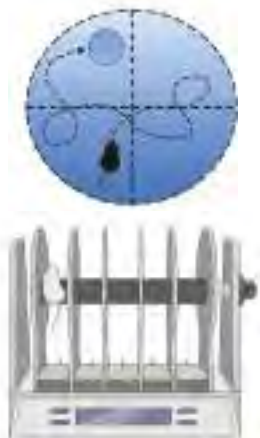
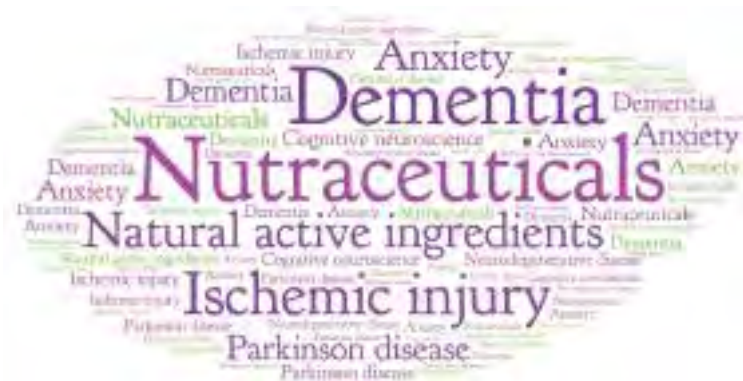
Allergy, Food safety, Biomaterials, Peptides, Extracellular matrix, Tissue engineering



56070928700



0000-0003-0065-7339



# 7

## TRANSFORMATIVE DATA SCIENCE AND COMPUTATIONAL RESEARCH





## TRANSFORMATIVE DATA SCIENCE AND COMPUTATIONAL RESEARCH

At the Faculty of Science, Kasetsart University, our research in data science and computational studies harnesses cutting-edge technology to solve complex problems. Our expertise spans machine learning, data mining, and social media analytics, driving advancements in recommendation systems and IoT applications. We focus on communication networks, blockchain security, and cloud architectural modeling to enhance digital infrastructure.

Our work in bioinformatics integrates machine learning and artificial intelligence to advance immunoinformatic and omics data analysis. We excel in image and video processing, leveraging deep learning for medical image analysis and computer vision. In human-centered computing, our research covers HCI design, digital avatars, and extended reality

We also specialize in algorithms, complexity theory, and theoretical computer science, exploring optimization, numerical analysis, and mathematical modeling. Our research extends to financial mathematics, differential equations, and combinatorics, contributing to fields like pedestrian evacuation models and social force simulations. Through interdisciplinary collaboration, we aim to pioneer transformative solutions in data science and computational research for a smarter, more connected future.



# Asst. Prof. Aurawan Imsombut

Department of Computer Science

E-mail: aurawan.i@ku.th

## Keywords

Natural Language Processing, Ontology Learning, Machine Learning

## Research Focuses

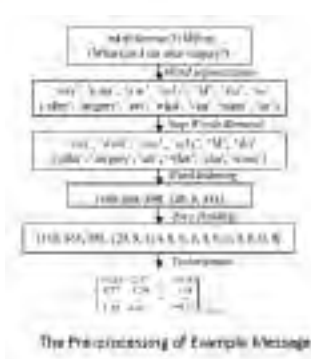
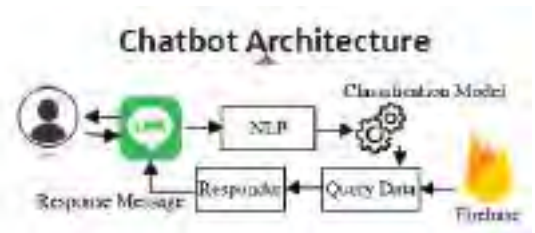
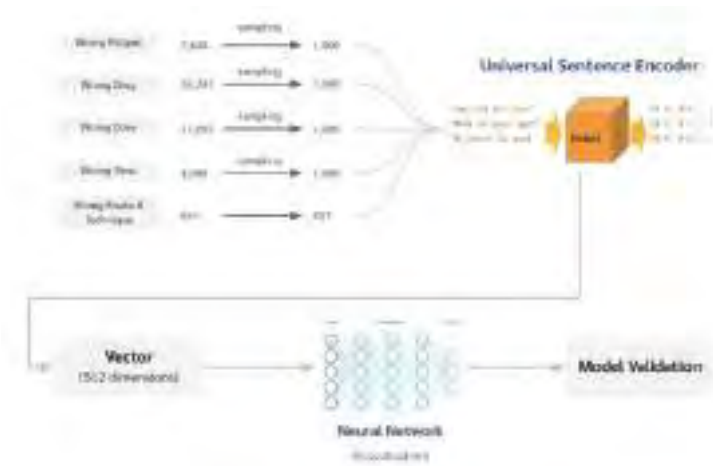
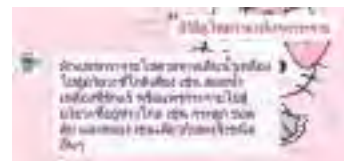
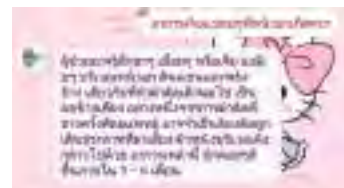
- Text Classification based on NLP, Machine Learning and Deep Learning, Chatbot Generation



24512155600



0000-0001-5799-100X





# Asst. Prof. Chakrit Watcharopas

Department of Computer Science

E-mail: chakrit.w@ku.th

## Keywords

fracture surface reconstruction,  
fluid simulation, phase transition,  
deep learning, real-time ice melting,  
self-driving car

## Selected publications

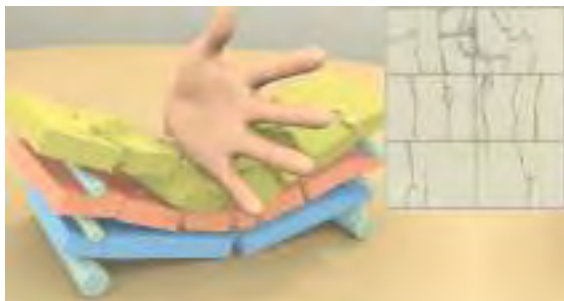
- Forecasting of photovoltaic power using deep learning
- Particle Merging-and-Splitting
- Ice Melting Simulation using SPH and Heat Transfer with Constant Ambient Temperature
- Extracting Surface Geometry from Particle-Based Fracture Simulations.



47562210000



0000-0002-0984-7975





# Asst. Prof. Nopadon Juneam

Department of Computer Science

E-mail: fscindj@ku.ac.th

## Keywords

Algorithms, Complexity Theory, Parallel Computing, Theoretical Computer Science

## Research Focuses

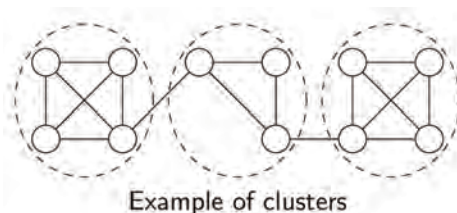
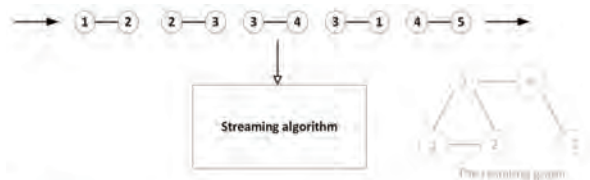
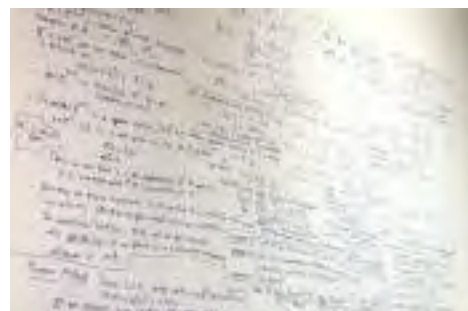
- Design and analysis of algorithms for processing large-scale data sets in modern
- computational models such as parallel algorithms, streaming algorithms, and sublinear algorithms



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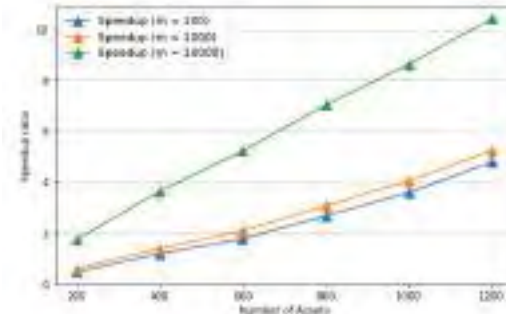
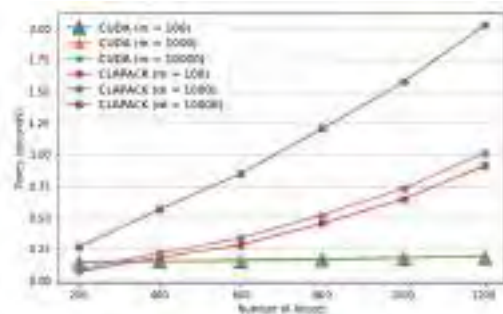
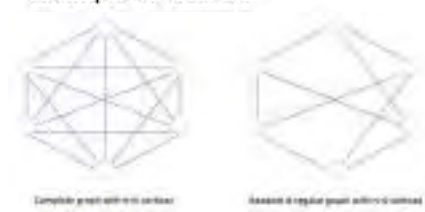


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The input is a stream of edges of the graph  $S = \langle e_1, e_2, \dots, e_m \rangle$ ; such a stream define a graph  $G = (V, E)$ , where  $V = \{1, 2, \dots, n\}$  and  $E = \{e_1, e_2, \dots, e_m\}$ .

In this model, algorithms are allowed to use  $O(n \cdot \text{polylog}(n))$ ; enough





# Asst. Prof. Pakaket Wattuya

Department of Computer Science

E-mail: fscipkw@ku.ac.th

## Keywords

Image and Video Processing,  
Computer Vision, Medical Image Analysis,  
Deep Learning



14833504600



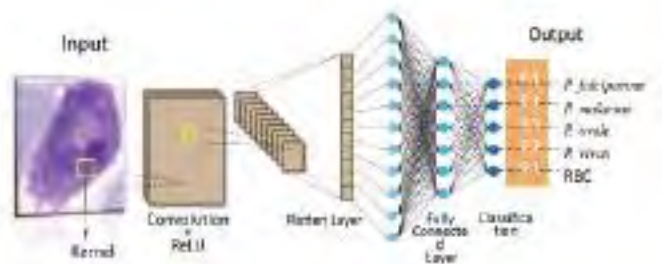
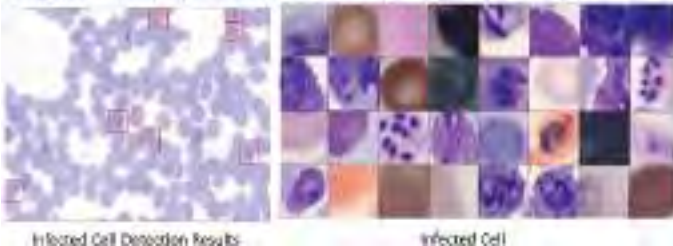
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Prediction of kidney disease progression in ultrasound images



Diagnosis of malaria parasites in red blood cells using deep learning



Detection of periodontal bone loss in radiography



Wood fibril detection and measurement



Microalgae recognition





# Dr.Pannapat Chanpaisaeng

**Department of Computer Science**

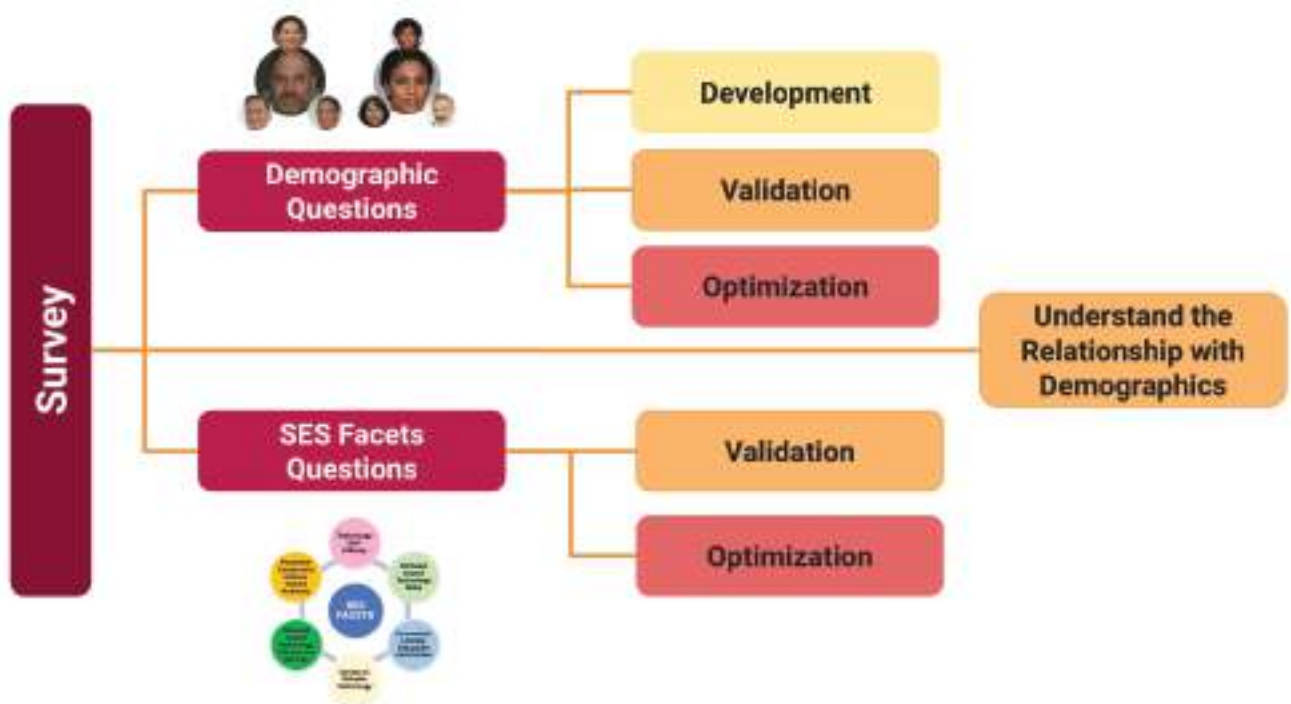
E-mail: pannapat.c@ku.th

## Keywords

Human-centered computing,  
Human computer Interaction (HCI),  
HCI design and evaluation methods,  
Inclusive Design

## Research Focuses

- Software design evaluation
- Human cognitive personas
- Survey design
- Qualitative data analysis (coding)
- Statistical analysis
- Inclusive software design to support marginalized population





# Dr. Pisut Wisessing

Department of Computer Science

E-mail: pisut.wi@ku.th

## Keywords

digital avatars, digital arts, emotions  
, applied perception, extended reality  
, spatial computing



57193241507



0009-0006-1936-4594

## Research Focuses

- Dr. Wisessing's recent research focuses on how lighting affects the emotional appeal of animated characters. His work reveals that different lighting setups can significantly alter a character's perceived emotions, making them more engaging.
- He also develops easy-to-use tools for creators to effectively adjust lighting, providing practical insights for both novice and experienced artists in animation.





# Dr. Sarach Tuomchomtam

Department of Computer Science

E-mail: aurawan.i@ku.th

## Keywords

Machine learning, Data mining, Social media analytics, Recommendation systems

## Research Interests

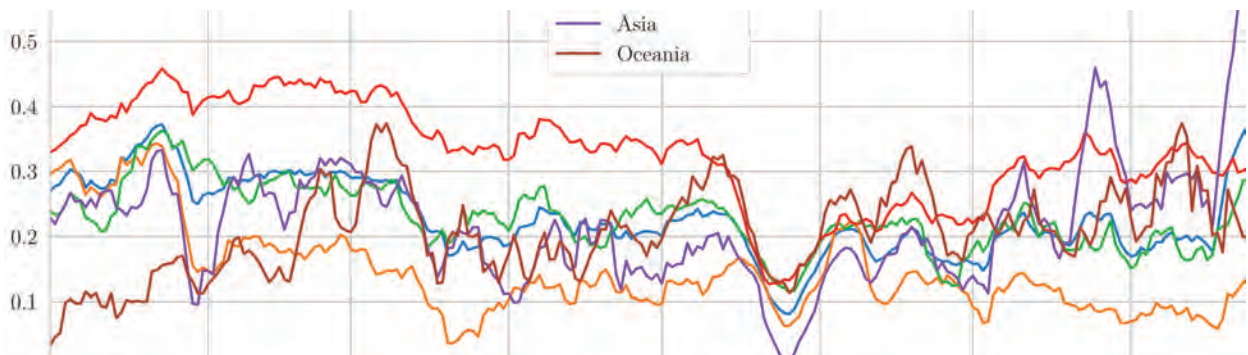
- Machine learning application
- Social media user profiling
- Social media opinion mining
- Generative AI application.



57208302494



0000-0001-9583-4734







# Asst. Prof. Sethavidh Gertphol

Department of Computer Science

E-mail: Setthavidh.Gku.th

## Keywords

IoT, Machine Learning, Data Science,  
Plant Factory

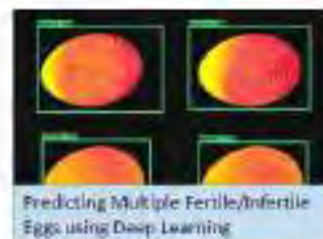


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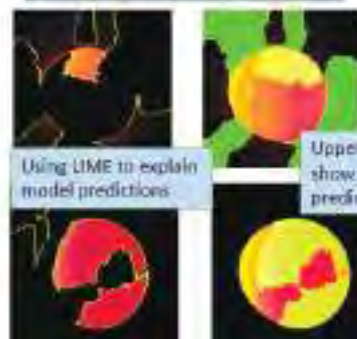


Scopus

8261161600



Predicting Multiple Fertile/Infertile Eggs using Deep Learning



Using LIME to explain model predictions

Upper pictures show unreasonable predictions



Plant Factory controlled by an IoT System



Vertical Growing Rails with controllable LED lighting



IoT Monitoring and Control System



Nutrient Solution with pH/EC monitoring and control



# Asst. Prof. Sukumal Kitisin

Department of Computer Science

Email: sukumal.i@ku.th

## Keywords

Communication Networks, Distributed Systems, Web Technologies; Blockchain, Secur



24479296000



0000-0002-0657-3227



## Research Focuses

- Multi-tenant Blockchain-Based State Land Allocation and Usage System for Government Agencies
- Identifying influencers with ensemble classification approach on twitter
- Horizontal auto-scaling and process migration mechanism for cloud services with skewness algorithm Towards a streaming content delivery network
- A study of autonomous system relationships within Thailand Towards programmable IoT with ActiveNDN
- CipherFlow: A Playground for Developing Privacy-Preserving IoT in Node-RED
- Automatic Tag Recommendation from Video Transcript on Social Media

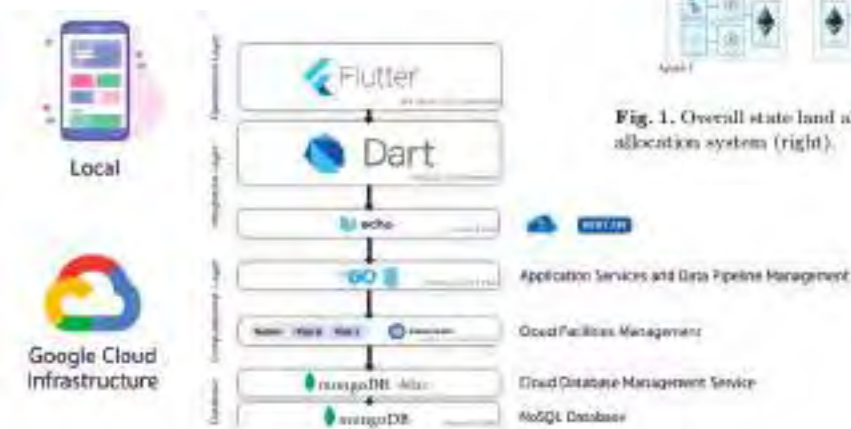


Fig. 1. Overall state land allocation system architecture (left). Components of the land allocation system (right).



# Dr. Tanaboon Tongbuasirilai

Department of Computer Science

Email: tanaboon.to@ku.ac.th

## Keywords

Reflectance Modeling, BRDF Acquisition,  
Sparse representation, Radiance Fields

## Research Interest

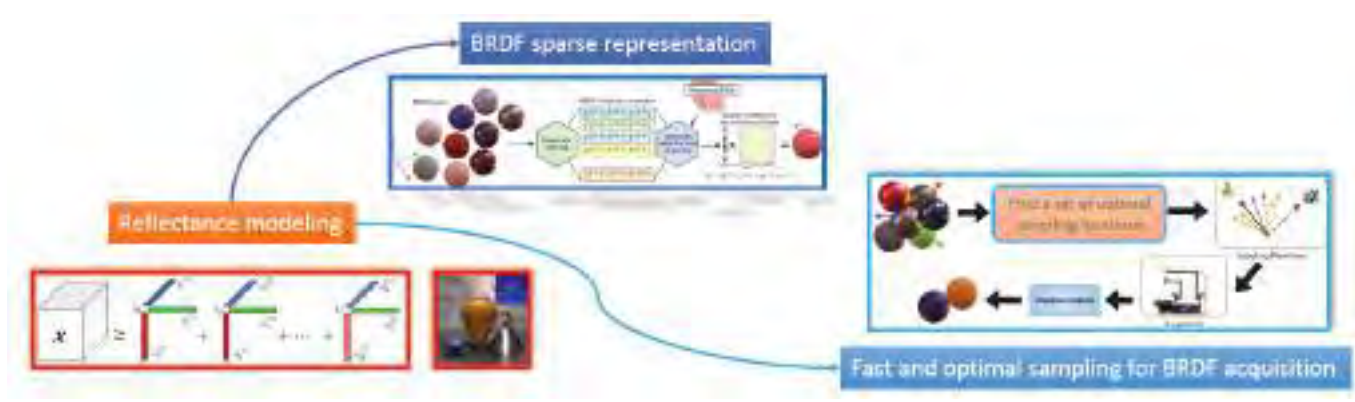
- Reflectance modeling
- BRDF acquisition
- Radiance fields for novel view synthesis.



57191052008



0000-0002-3239-8581





# Asst. Prof. Thammakorn Saethang

Department of Computer Science

E-mail: thammakorn.s@ku.th

## Keywords

Bioinformatics, Machine Learning, Immunoinformatics, Data Science, Omics, Artificial Intelligence



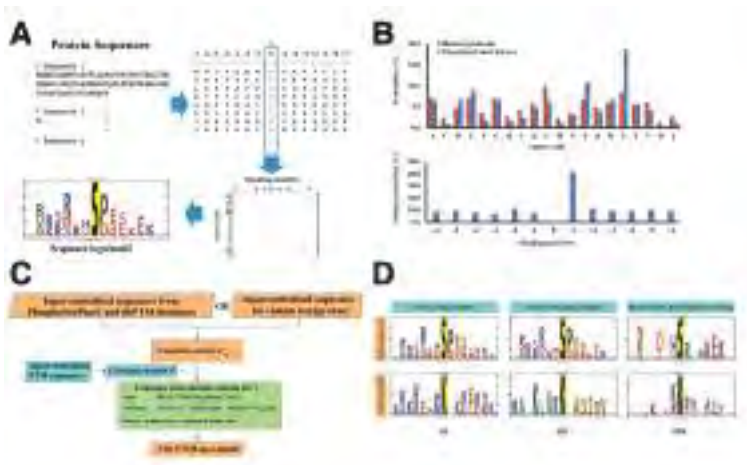
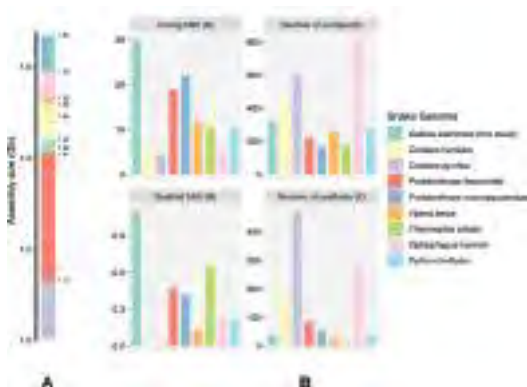
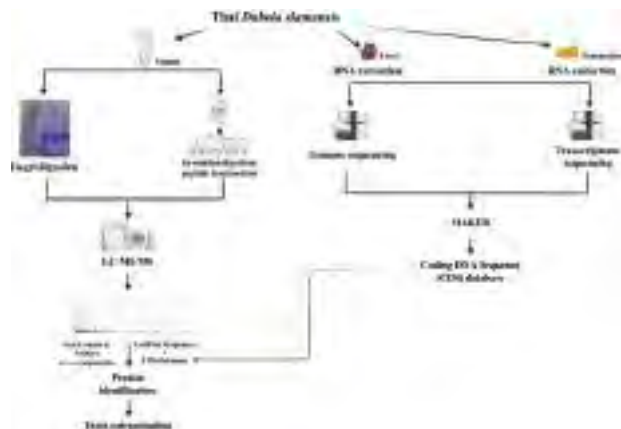
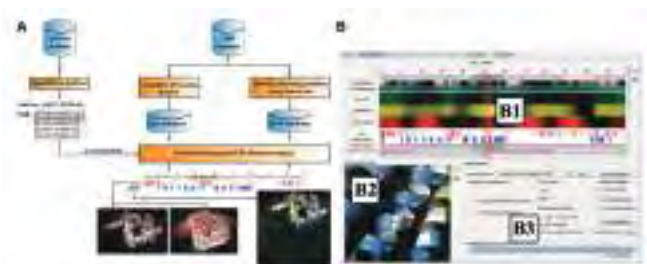
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0000-0002-0397-7111

## Research Focuses

- Antimicrobial peptide prediction
- Integrative Omics Data
- Epitope Prediction
- Peptide Encoding
- Snake Genome Assembly
- Antibody Design
- Scoliosis x-ray image classification
- Medical Image Analysis
- Post-translational modification prediction.





# Assoc. Prof. Thepparit Banditwattanawong

**Department of Computer Science**

E-mail: fscitrbs@ku.th

## Keywords

Data network optimization,  
Cloud architectural modeling,  
Unbiased performance discretization



15126718200



0000-0001-5418-7876



## Areas of expertise

- Modern data networking
- Cloud-edge computing
- Performance analytics

## Selected journal publications

- On Formulation of Online Algorithm and Framework of Near-optimally Tractable Eviction for Nonuniform Caches
- Multi-provider Cloud Computing Network Infrastructure Optimization
- Temporal Acceleration for Cloud-CDN-Fog-Edge Hierarchy by Leveraging Proximal Object Replicas
- Hybrid data analytic technique for grading fairness
- On Characterization of Norm-referenced Achievement Grading Schemes toward Explainability and Selectability



# Assoc. Prof. Worasait Suwannik

Department of Computer Science

E-mail: worasit.suwannik@gmail.com

## Keywords

Machine learning, IT audit, security,  
project management, IoT, cloud, blockchain,  
cryptography



24462571500



0000-0002-1063-9532





# Asst. Prof. Angkana Sripayap

Department of Mathematics

E-mail: fscianr@ku.th

## Keywords

Algebra, linear Algebra, and Number Theory



57208239681



algebraic independence Analytic functions arithmetic progression base  
representation character sum digit exponent pair method generalized  $r$ -free integer Lambert  
series Liouville number Mahler's gap theorem.  $p$ -adic exponential polynomial periodic  
expansion Piatetski-Shapiro sequence Roth's theorem square-full  
number transcendence Turan's theorem ทฤษฎีจำนวน พีชคณิตเชิงเส้น พีชคณิตนามธรรม



# Dr.Boonlert Srihirun

**Department of Mathematics**

E-mail: fscibls@ku.th

## Keywords

Analysis



16403269400



Analysis determining equations Lie group of transformations Lie groups stochastic  
process symmetry analysis





# Dr.Charn Khetchaturat

Department of Mathematics

E-mail: fscichk.wat@ku.th

## Keywords

Optimization, Computational, Intelligence

Artificial Neural Network artificial neural networks Automatic weather station border crossing Cherry Valley deck Coastal erosion coastal  
erosion technique Computational Critical level Cutting stock problem Decadal Support Vector e-learning Full-scale simulation groundwater GTS Heat  
Infrared Intelligence mathematics neural network nonlinear Ocean Wave Modeling one-dimensional Optimization system chaotic attractor prediction odd-order function regression  
analysis Shallow water Soybean meal tropical cyclone tropical cyclone movement, WAF-cyclot Wave spectra. nonresonant wave resonance. fluid flow/vortex dynamics  
Kleinman/Johnson analysis wavelet analysis/wavelets. signal noise Signal noise I in dynamic systems/oscillations. nonlinear resonance/chaos. nonlinear wavelet analysis



# Dr.Chinnawat Chetcharungkit

Department of Mathematics

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## Keywords

boosting algorithm,  
principal component analysis, regression,  
classification, clustering

## Research Field

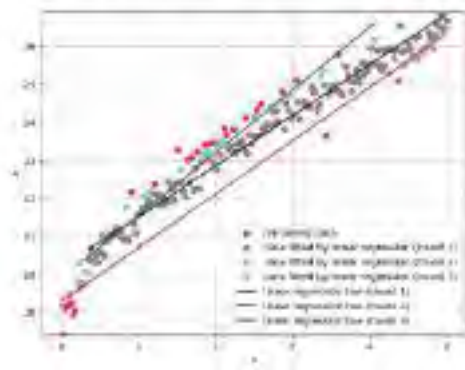
- Data science, Artificial intelligence, Machine learning modelling, Coding theory, Algebra and Number theory



0009-0003-0859-3285



Boosting algorithm for linear regression



Forecasting Forex trend using classification model





# Asst. Prof. Chitlada Somsup

**Department of Mathematics**

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12794523100



#### Research Interests

- Algebra



# Asst. Prof. Juntima Makmul

**Department of Mathematics**

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## Keywords

Pedestrian evacuation model,  
Cellular automaton model, Social force model,  
Microscopic model, Macroscopic model



57214722453



0000-0001-7971-0299

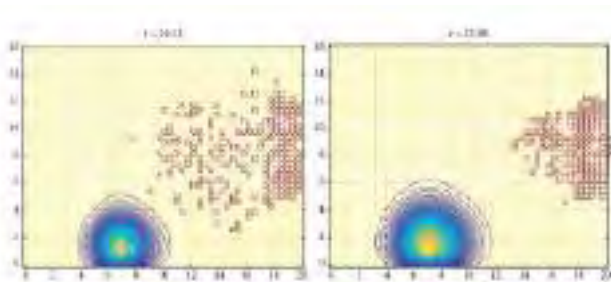


## Research Topics

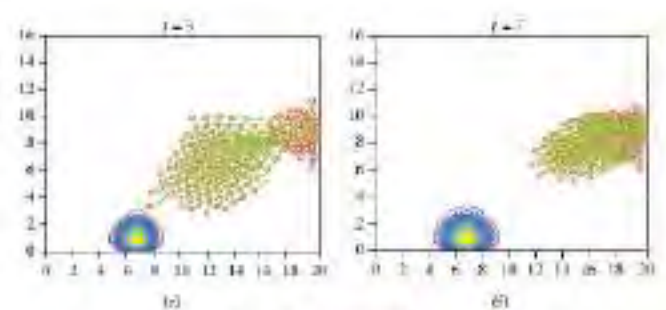
1. Pedestrian Evacuation Models
2. Cellular Automaton Model for Pedestrian Movements
3. Social Force Model for Pedestrian Movements
4. Microscopic and Macroscopic Models for Crowds

## References

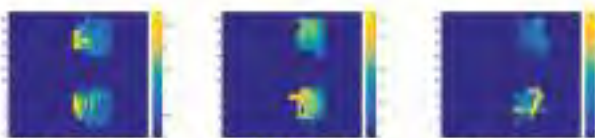
1. J. Makmul, "A cellular automaton model for pedestrians' movements influenced by gaseous hazardous material spreading" Modelling and Simulation in Engineering, vol. 2020, p. 10, 2020.
2. J. Makmul, "A social force model for pedestrians' movements affected by smoke spreading," Modelling and Simulation in Engineering, vol. 2020, p. 11, 2020.
3. J. Makmul, "A pedestrians flow model during propagation of smoke: microscopic and macroscopic approaches," Safety Science, vol. 133, pp. 1–11, 2021.



CA model [1]



SF model [2]



(a) Microscopic

(b) Hydrodynamic

(c) Scalar

Microscopic and Macroscopic models [3]



# Asst. Prof. Katthaleeya Daowsud

Department of Mathematics

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## Keywords

Algebra and Number Theory



57200036248



0000-0003-1032-5901



Boolean **Boolean semiring** Boolean semirings **Commutative** commutative, Congruence **Continued**  
fractions derivation determinants fuzzy fuzzy PIU-algebra fuzzy PIU-ideal Generating function genus-2 curves Genus 2 curves Torsion Hessian  
matrix Homomorphism ideal **Jacobians** locally nilpotent Near ring Number Theory and Algebra PIU- algebras Rational point of order 11 rational point of order  
11. Ring **semiring** Semirings torsion



# Asst. Prof. Monrudee Sirivoravit

Department of Mathematics

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## Keywords

Algebra, Number Theory



57217121150



0000-0003-3290-5923



Algebra algebraic structure **Boolean semiring** Boolean semirings Commutative Congruence **derangement** Derivation Derivations derivative Gamma  
ring Gamma Rings Homomorphism locally nilpotent free ring **recurrence relation** Reverse derivation Ring semiring Number Theory



# Assoc. Prof. Montri Maleewong

Department of Mathematics

E-mail: Montri.M@ku.th

## Keywords

Natural Language Processing,  
Ontology Learning, Machine Learning

## Research Interest

- Numerical analysis and simulation, Water wave theory, Data driven modelling and machine learning



8693849000



0000-0003-2134-661X





# Asst. Prof. Pattira Ruengsinsub

**Department of Mathematics**

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## Keywords

Independence of arithmetic function,  
Dirichlet series

## Research Interest

- Number Theory, Algebra



8426556600



0000-0002-1596-2873







# Dr. Phiraphat Sutthimat

**Department of Mathematics**

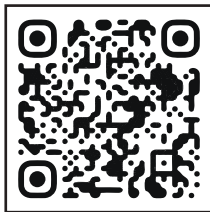
E-mail: phiraphat.sut@ku.th

## Keywords

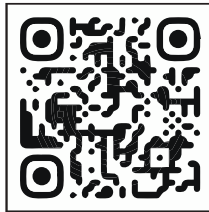
Financial Mathematics, Stochastics process, Numerical Method



57205115224



0000-0002-0986-2518



### Article

- Closed-form formulas for conditional moments of inhomogeneous Pearson diffusion processes  
Sutthimat, P., Mekchay, K.  
Communications in Nonlinear Science and Numerical Simulation, 2022, 106, 106095

### Article

- *Closed-form formula for conditional moments of generalized nonlinear drift CEV process*  
Sutthimat, P., Mekchay, K., Rujivan, S.  
Applied Mathematics and Computation, 2022, 428, 127213

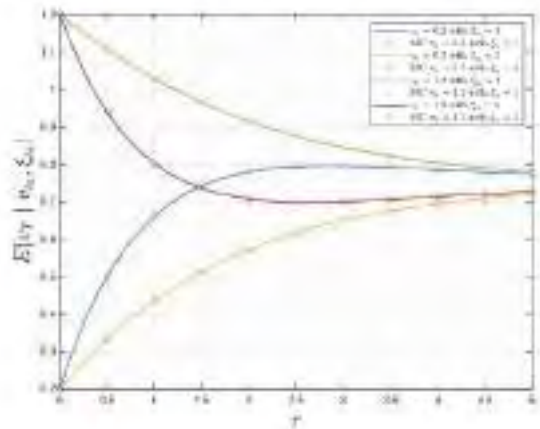
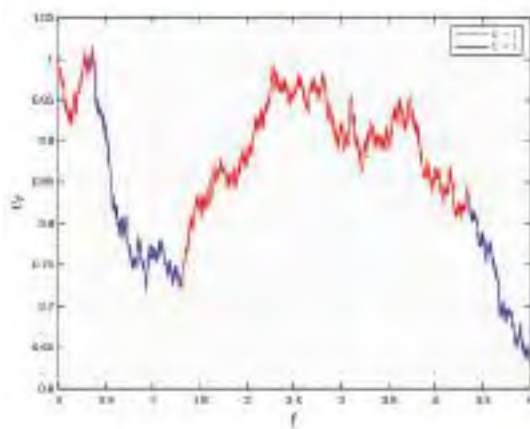
### Article

- A unified approach to derive explicit solutions of generalized second order linear recurrences and applications  
Sutthimat, P., Laohakosol, V., Meesa, R.  
Discrete Mathematics, 2024, 347(2), 113757

### Article • Open access

- Closed-form solutions of general second order linear recurrences and applications  
Laohakosol, V., Meesa, R., Sutthimat, P.  
Discrete Mathematics, 2023, 346(1), 113206

## Stochastic volatility model with regime switching





# Assoc. Prof. Pimchana Siricharuanun

**Department of Mathematics**

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## Keywords

Upper Triangular Matrix, Square Matrix, Matrix,

## Research Interests

- Applied Math and Algebra



56168486900



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# Asst. Prof. Pongpol Ruankong

**Department of Mathematics**

E-mail: fscipru@ku.th

## Keywords

Essential closures, Benford's law, Mixed graphs

## Research Interests

- Number Theory, Graph Theory, Measure Theory, Probability Theory



55362136900



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$$\left[ \sqrt[n]{n} + \sqrt[n]{n-1} + \sqrt[n]{n+2} + \dots + \sqrt[n]{n+m-1} \right] = \left\lceil \sqrt[n]{m^n n + \frac{m^p(m-1)}{2} - 1} \right\rceil$$

$$\mathcal{L}_{p,k}(n) = \mathcal{L}_{p,k}(n-1) + \mathcal{L}_{p,k}(n-p-1) + k$$

$$F_n(d) \equiv P(Y_n = d) = \sum_{\ell=1}^{\infty} P\left(\frac{d}{10^\ell} \leq X_n \leq \frac{d+1}{10^\ell}\right) = \sum_{\ell=1}^{\infty} \int_{d/10^\ell}^{(d+1)/10^\ell} f_n(t) dt$$



# Asst. Prof. Puntip Toghaw

**Department of Mathematics**

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## Keywords

Mathematical Modelling, Data science,  
Numerical analysis



18839125400



0000-0001-7703-2068





# Asst. Prof. Ruanglak Jongchotinon

**Department of Mathematics**

E-mail: fscirlj@ku.th

## Keywords

Differential Equations, Algebra



56974303400



0009-0007-8400-6619





# Assoc. Prof. Teerapat Srichan

**Department of Mathematics**

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## Keywords

Analytic number theory, Riemann hypothesis, partitions of integer



57128486900



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$$\sum_{n \leq x} \frac{1}{n^s} = 1 - \prod_p \left(1 - \frac{1}{p^s}\right) + O\left(x^{-\frac{s+1}{2}}\right) \quad (x \rightarrow \infty),$$

(Riemann hypothesis)

$$\sum_{n \leq x} \frac{1}{n^s} = 1 - \prod_p \left(1 - \frac{1}{p^s}\right) + O\left(x^{-\frac{s+1}{2}} \log^2 x\right),$$

(Riemann hypothesis)

$$\zeta(s) = \sum_{n=1}^{\infty} \frac{1}{n^s}.$$

$$\lim_{x \rightarrow \infty} \frac{\sum_{n=1}^x a^{n+2k} \zeta(\sigma + i(S_k - \sigma) - n)}{\sqrt{n} \log^2(1+n)} = 0 \quad \text{almost surely,}$$

$$\left| \sup_{n \geq 1} \frac{\left| \sum_{l=1}^n a^{l+2k} \zeta(\sigma + i(S_k - \sigma) - n) \right|}{\sqrt{n} \log^2(1+n)} \right|_2 < \infty.$$

$$S_2(X, l, q) = (c_0^2(x_0) + a^2(x_1))X^{l/2} + (c_0^2(x_0) + a^2(x_1))X^{l/2} + O(q^{l/2+\epsilon}X^{l/2}),$$

$$c_0^2(x) = \prod_{m=1}^l \prod_{n=1}^m \frac{x(p_n) p_n^{-l/r} q_n^{(l-m)/r}}{(p_n^{l/r} - x(p_n)) (q_n^{l/r} - x(p_n))} c_0^2(y),$$

$$a^2(x_{r-1}) = \prod_{m=1}^r \prod_{n=1}^m \frac{x_{r-1}(p_n) p_n^{-l/r} q_n^{(l-m)/r}}{(p_n^{l/r} - x_{r-1}(p_n)) (q_n^{l/r} - x_{r-1}(p_n))} a^2(x_{r-1}),$$

$$c_0^2(x_{r-1}) = \frac{\phi(q)}{q^{\phi(q)/(1-q)}} \prod_{p|q} (1 - x_{r-1}^{l/r} (p)^{-l/r}) \frac{\mathcal{L}(l/r^2, x_{r-1}^{l/r})}{\mathcal{L}(l/r, \lambda_0)},$$

$$a^2(x_0) = \frac{\phi(q)}{q^{\phi(q)/(1-q)}} \frac{\mathcal{L}(l/r^2, \lambda_0)}{\mathcal{L}(l/r, \lambda_0)}.$$



# Dr. Thorranin Thansri

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## Keywords

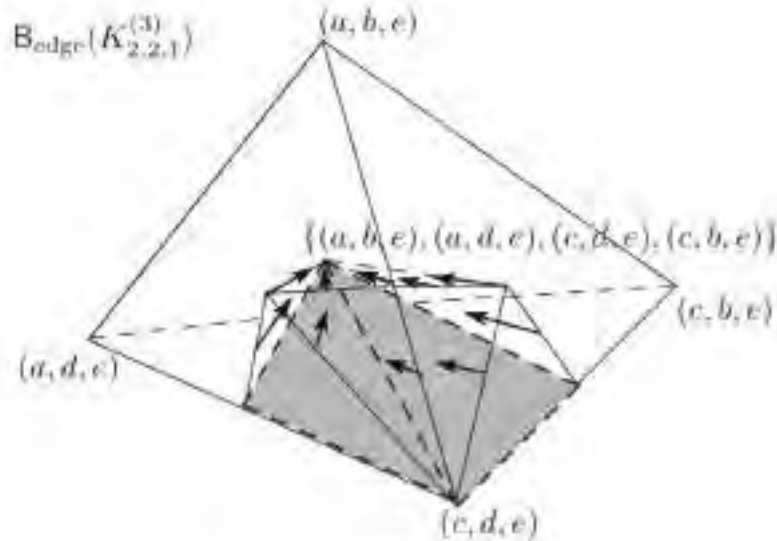
Combinatorics, Algebraic Topology, Number Theory



55535567100



0000-0002-8973-4793





# Asst. Prof. Udomsak Rakwongwan

Department of Mathematics

E-mail: [udomsak.ra@ku.th](mailto:udomsak.ra@ku.th)

## Keywords

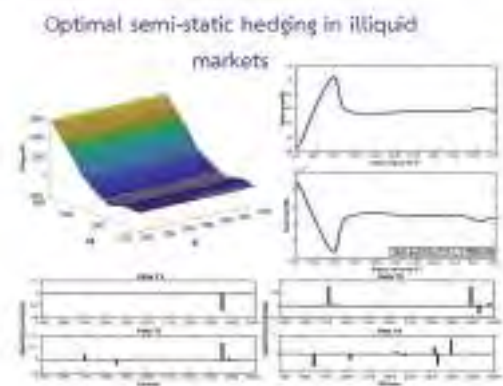
Financial Mathematics, Indifference Pricing, Static Hedging



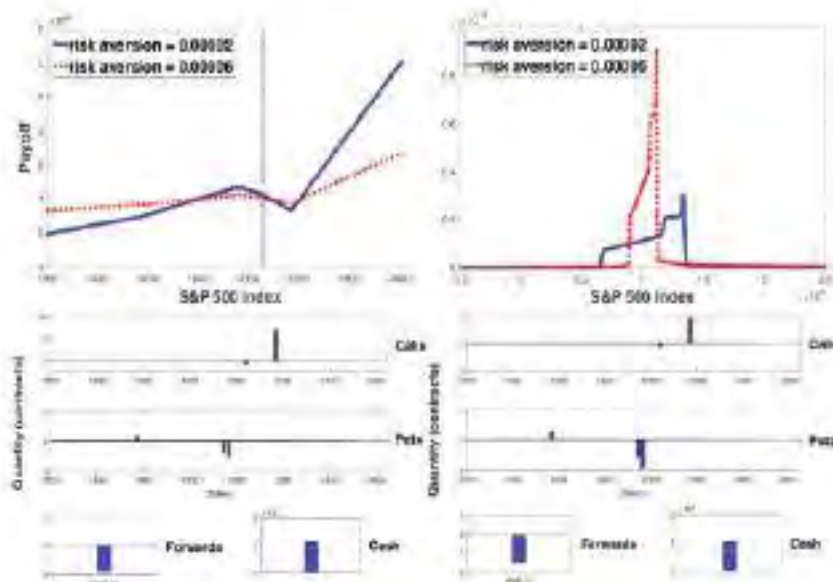
57204047088



0000-0001-6909-4111



## Pricing index options by static hedging under finite liquidity







# Assoc. Prof. Utsanee Leerawat

**Department of Mathematics**

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## Keywords

Algebra, Differential Algebra, Universal algebra, Combinatorics



8227062800



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- Algebra, in its most basic form, studies mathematical symbols and the rules for working with them. It serves as a common thread that runs through most of mathematics. It encompasses everything from solving basic equations to studying abstract concepts like groups, rings, and fields.

## Selected Publications

- Leerawat, U. and K. Daowsud. 2023. Determinants of some Hessenberg matrices with generating functions. *Special Matrices*, 11: 1–8.
- Leerawat, U. and B. Setthanarak. 2023. Regularity and ideals in near – semirings. *JP Journal of Algebra, Number Theory and Applications*. 60(1):39 – 57.
- Leerawat, U. and P. Chotchaya. 2022. On permuting  $n$ -  $(f, g)$  – derivations of lattices. *International Journal of Mathematics and Computer Science*, 17(1): 485–497.
- Leerawat, U. and B. Setthanarak. 2022. Some conditions on near-semirings. *JP Journal of Algebra, Number Theory and Applications*, 55: 37 – 51.
- Leerawat, U. and P. Toka. 2022. Some differential identities with  $f$  – derivations on prime rings. *JP Journal of Algebra, Number Theory and Applications*, 57: 39 – 52.
- Lapuangkham, S. and U. Leerawat. 2021. On commuting additive mappings on semiprime rings. *Asian-European Journal of Mathematics*. 14(5): Article Number: 2150079 (9 pages) DOI: 10.1142/S1793557121500790.



# Asst. Prof. Watcharapon Pimsert

Department of Mathematics

E-mail: fsciwcrp@ku.th

## Keywords

Cauchy's Functional Equations,  
Integer Partitions

## Research Interest

- Functional Equations, Number Theory



14830593100



0000-0001-8049-6752



$$f(x + y) = f(x) + f(y)$$

$$f(xy) = f(x) + f(y)$$

$$f(x + y) = f(x)f(y)$$

$$f(x + y) = f(x)f(y)$$

$$5 = 5$$

$$= 1 + 4$$

$$= 2 + 3$$

$$= 1 + 1 + 3$$

$$= 1 + 2 + 2$$

$$= 1 + 1 + 1 + 2$$



# Assoc. Prof. Ampai Thongteeraparp

Department of Statistics

E-mail: fsciamu@ku.ac.th

## Keywords

Nonparametric, Multivariate Analysis, Experimental design, Sampling

## Research Focuses

- Nonparametric Statistics
- Bootstrap Methods
- Robust Statistics



5488998600

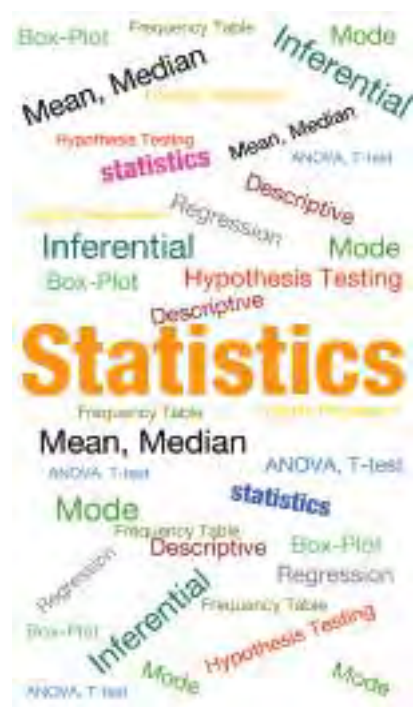


0000-0002-4703-8706



## Publication

- The Generalized Distributions on the Unit Interval based on the T-Topp-Leone-Family of Distributions.
- The Zero-Truncated Poisson-Weighted Exponential with Applications.
- An Alternative Multiple Hypotheses Testing Procedure Using Fuzzy Approach.
- Parameter Estimation of the Negative Binomial New Weighted Lindley Distribution by the Method of Maximum Likelihood.





# Assoc. Prof. Boonorm Chomtee

**Department of Statistics**

E-mail: fsciboc@ku.ac.th

## Keywords

Response Surface Designs,  
Design of Experiments, Regression Models

## Research Focuses

- Design of Experiments
- Response Surface Methodology
- Regression Models



14629994900

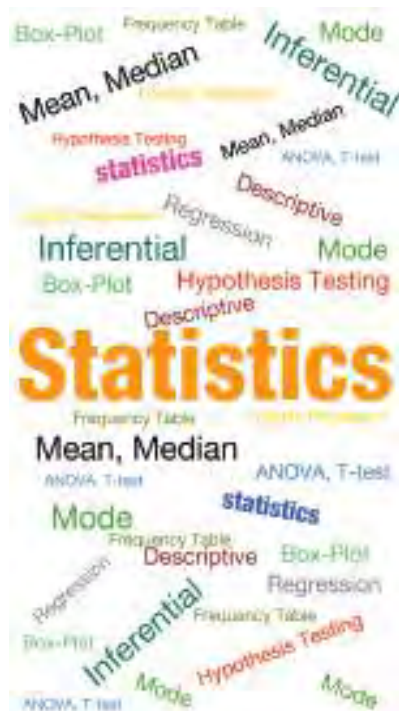


0000-0003-0711-6017



## Publication

- Wanida Limmun, Boonorm Chomtee and John J. Borkowski. 2023. Generating Robust Optimal Mixture Designs Due to Missing Observation Using a Multi-Objective Genetic Algorithm. Mathematics. DOI: 10.3390/math11163558.
- Pattarawadee Sumthong Nakmee, Boonorm Chomtee, Methee Juntaropakorn, and Supranee Ngamprasit. 2023. Effects of Melaleuca cajuputi leaf extract on inhibition of seed germination and seedling growth of 12 weed species. Agriculture and Natural Resources. DOI: 10.34044/j.anres.2023.57.3.07.
- Chawanee Supirat, Boonorm Chomtee, and John J. Borkowski. 2022. The Effects of Sampling from Finite Populations in a Mixed Effects Gage R&R Study. Thailand Statistician. 20(3): 686-709.





# Asst. Prof. Chantha Wongoutong

**Department of Statistics**

E-mail: fscictw@ku.ac.th

## Keywords

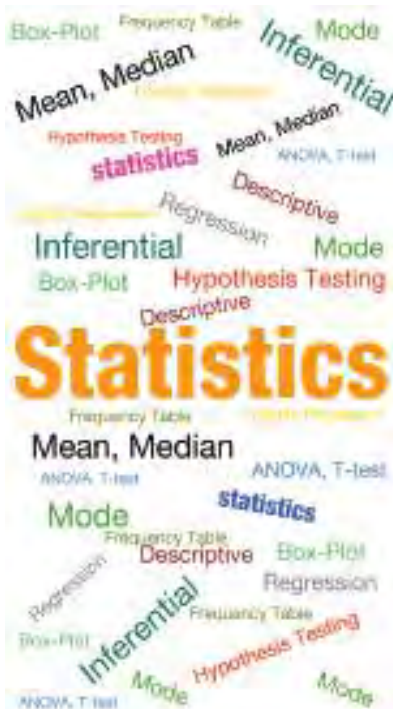
Time Series Analysis, Imputaion Method, Response surface, Multivariate Analysis



57196041982



0000-0001-5985-7947



## Research Focuses

- Time Series Analysis in data science
- Imputaion Method in missing data
- Response Surface Analysis for optimization
- Multivariate Analysis in medical research
- Clustering Analysis for biological data

## Publication

- Wongoutong C. A modified weighting system for combined forecasting methods based on the correlation coefficients of the individual forecasting models. *Pakistan Journal of Statistics and Operation Research*. 2023 Sep 3:551-68.
- Junthopas W, Wongoutong C. Setting the Initial Value for Single Exponential Smoothing and the Value of the Smoothing Constant for Forecasting Using Solver in Microsoft Excel. *Applied Sciences*. 2023 Mar 29;13(7):4328.
- Wongoutong C. Imputation methods for missing response values in the three parts of a central composite design with two factors. *Journal of Statistical Computation and Simulation*. 2022 Jul 24;92(11):2273-89.
- Wongoutong C. Imputation for consecutive missing values in non-stationary time series data. *Advances and Applications in Statistics*. 2020 Oct;64(1):87-102.



# Asst. Prof. Jeeraporn Thaithanan

**Department of Statistics**

E-mail: fscijpt@ku.ac.th

## Keywords

Regression Analysis, Time Series,  
Experimental Design



57223026968



0000-0002-2439-6316

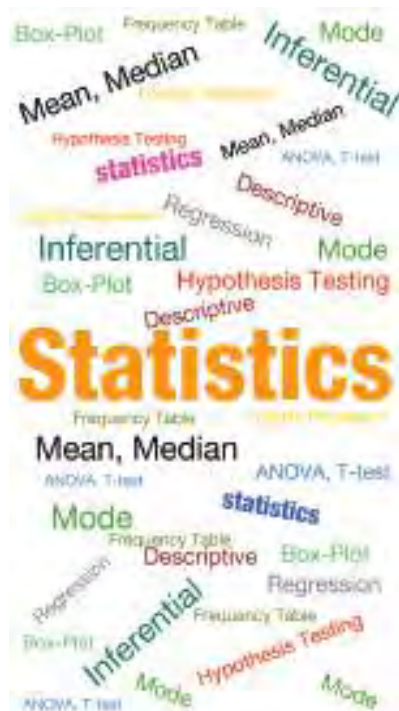


## Research Focuses

- Applied Statistics
- Statistical Inference
- Regression Analysis
- Time Series Analysis
- Experimental Design

## Publication

- The efficiency of Ridge Estimations for Multi-collinearity Multiple Linear Regression: A Monte-Carlo Simulation-Based Study, 2564
- Comparing the efficiency levels of Multiple Comparison Methods for Normal Distributed Observations, 2565
- The impact of a random vector with variables from normal and non-normal-distributions on multivariate control charts, 2565





# Assoc. Prof. Juthaphorn Sinsomboonthong

Department of Statistics

E-mail: fscijps@ku.ac.th

## Keywords

Inferential Statistics, Missing Data, Outliers, Control Chart, Machine Learning



40661827000



0000-0002-3375-5982

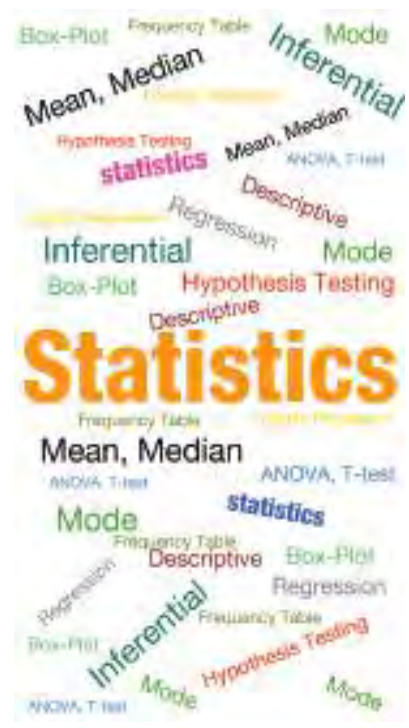


## Research Focuses

- Point and Interval Estimations of Parameter
- Statistical Hypothesis Testing
- Statistical Quality Control
- Predictive Modeling
- Machine Learning

## Publication

- Performance of Some Confidence Intervals for Estimating the Population Mean Under Contaminated Normal Distribution
- New Quality Control Chart to Quickly Detect the Changes of Process Average
- Estimation of the Population Mean for Incomplete Data by Using Information of Simple Linear Relationship Model in Data Set
- Weighted Maximum Likelihood Correlation Coefficient to Handle Missing Values and Outliers in Dataset





# Assoc. Prof. Lily Ingsrisawang

Department of Statistics

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## Keywords

Air pollution, GLMM, Frailty survival model, Disease mapping, Drug resistance



6508201900



0000-0001-6177-1587

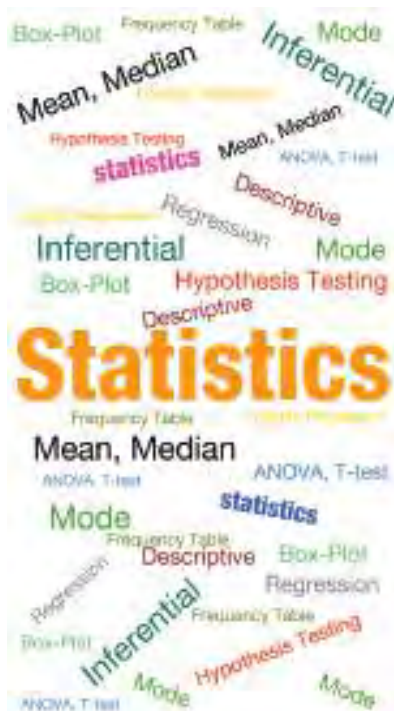


## Research Focuses

- Environmental Health Studies
- Longitudinal and Survival Data Analysis
- Spatial-temporal Modelling
- Applying Data Science Techniques in
- Health Research

## Publication

- Association between out-patient visits and air pollution in Chiang Mai, Thailand: Lessons from a unique situation involving a large data set showing high seasonal levels of air pollution. PLoS ONE 17(8): e0272995. <https://doi.org/10.1371/journal.pone.0272995>.
- A real-world study of effectiveness of intravitreal bevacizumab and ranibizumab injection for treating retinal diseases in Thailand. BMC Ophthalmology. <https://doi.org/10.1186/s12886-019-1086-1>.
- Comparison of nonparametric survival estimators for interval censoring mixed with right-censoring type I. Thailand Statistician.







# Assoc. Prof. Mena Lao

**Department of Statistics**

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## Keywords

Unequal probability sampling,  
Adaptive cluster sampling,  
Statistical modelling

## Research Focuses

- Sampling Designs
- Categorical data analysis
- Generalized Linear Models

## Publication

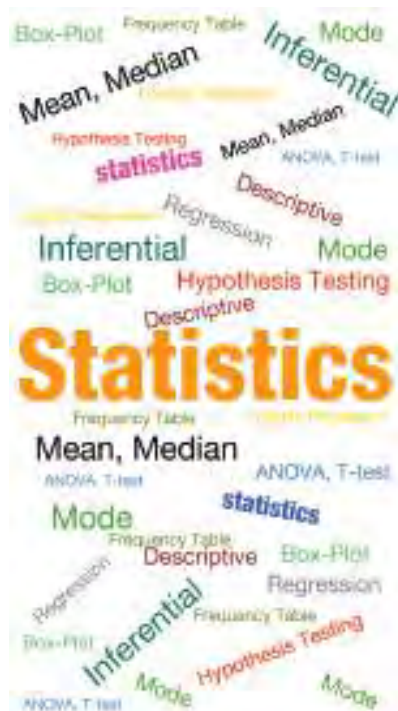
- Lao, M. and Dryver, A. L. Adaptive cluster path sampling. Communications in Statistics Simulation and Computation (In Press).
- Lao, M., Lukusa T.M. Statistical approaches for assessing the effectiveness of safety devices used in preventing head injuries from motorcycle crashes. Case Studies on Transport Policy, 2023, 11: 100935
- Lao, M. Stratified Path Sampling. Thailand Statistician, 2022, 20(3): 562-574.
- Lao, M., Nidsunkid, S., Borkowski, J.J. A Regression Estimator in Path Sampling.
- International Journal of Mathematics and Computer Science, 2022, 17(2): 635-646



55358063900



0000-0002-3967-3179





# Dr. Pupe Sudsila

Department of Statistics

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## Keywords

T-X family of Distribution, Missing Value



57919842200



0000-0002-8013-0803

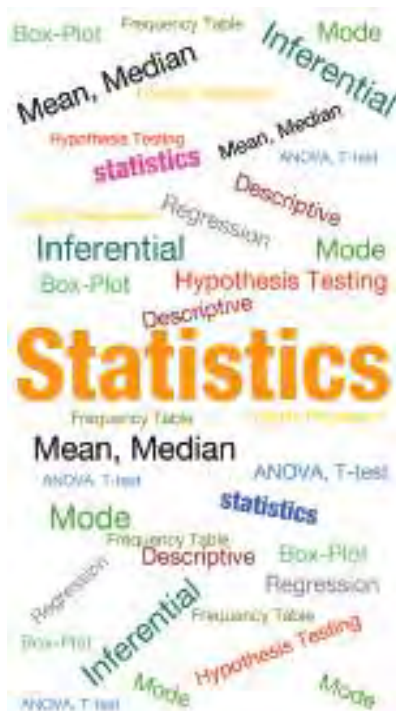


## Research Focuses

- Anti-Retroviral Therapy
- T-X family of Distributions
- Discrete Probability Distributions
- Missing Value

## Publication

- Treatment Outcomes After Switching to Second-Line Anti-Retroviral Therapy: Results From the Thai National Treatment Program, 2023
- People failing first-line regimens remain at risk for adverse second-line outcomes, 2023
- The Generalized Distributions on the Unit Interval based on the T-Topp-Leone Family, 2022
- A Comparison of the Imputation Methods for Missing Independent Variable in Binary Logistic Regression Analysis, 2018





# Asst. Prof. Saowapa Chaipitak

Department of Statistics

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## Keywords

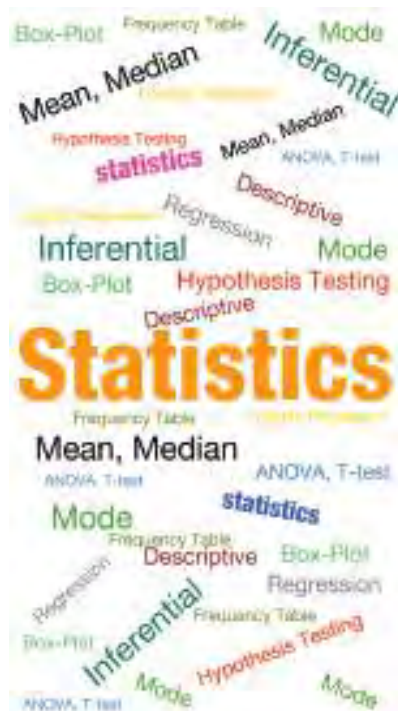
Multivariate Normal Distribution,  
High-dimension Covariance Matrices,  
Multivariate Analysis



55606296200



000-001-6704-6546



## Research Focuses

- High-dimensional Data Analysis
- Time Series and Forecasting
- Stochastic Operations Research
- Markov Chains

## Publication

- Chaipitak, S. and B. Choopradit. 2023. ARIMA for forecasting the exchange rate of the Thai Baht against the Chinese Yuan. *Advances and Applications in Statistics*. 84: 51-64.
- Chaipitak, S. 2020. Time series ARIMA model for prediction of Thailand's monthly average cassava starch domestic price. *Advances and Applications in Statistics*. 63(2): 191-205.
- ณัชพล อธิประยูร, อัมไพ ทองธีรภาพ และเสาวภา ชัยพิทักษ์. 2563. การเปรียบเทียบวิธีการพยากรณ์สำหรับอนุกรมเวลาที่มีลักษณะไม่เป็นเชิงเส้นและไม่คงที่. *วารสารวิทยาศาสตร์และเทคโนโลยี*. 28(2): 197-207.
- ศศิภรณ์ สัทธีศร, เสาวภา ชัยพิทักษ์ และธิดาพร ศุภภากกร. 2561. การเปรียบเทียบสถิติทดสอบความเท่ากันของเมทริกซ์ความแปรปรวนรวมสองประชากรสำหรับข้อมูลที่มีมิติสูง. *วารสารวิทยาศาสตร์และเทคโนโลยี*. 26(3): 429-437.
- Choopradit, B., S. Chaipitak and S. Chongcharoen. 2015. Two-sample tests for high-dimensional repeated measures designs with unequal variances. *The Thai Journal of Mathematics. Special issue on ICMSA2015 (2015), 2016*, 211 – 226.
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# Asst. Prof. Sawaporn Hinsharanan

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## Keywords

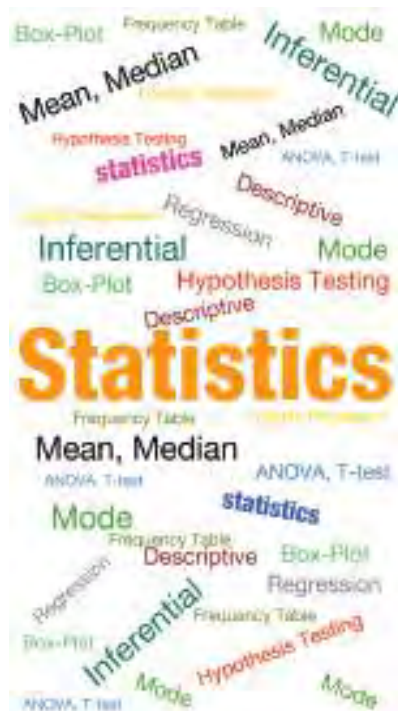
sufficient reduction,  
statistical process control,  
health surveillance



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## Research Focuses

- Dimensionality reduction
- Time series models and applications
- Statistical quality control
- Spatio-temporal analysis in health surveillance

## Publication

- Hinsharanan, H. and Stillman, E. C. (2021). The robustness of sufficient reduction methods for detecting shifts of various types in multivariate processes. *Quality and Reliability Engineering international*. 37(5), 2276–2287.
- Saenkaing, A. and Hinsharanan, S. (2021). Efficiency comparison of control charts for monitoring a positive mean shift in Poisson process. *The Journal of Applied Science*. 20(2), 80–93.
- Thuathong, W. and Hinsharanan, S. (2021). Comparison of time series models for forecasting pneumonia cases in Thailand. *Thai Science and Technology Journal*. 29(3), 365–377.



# Asst. Prof. Sirinya Teeraananchai

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## Keywords

Biostatistics,  
Advanced regression/longitudinal analysis,  
survival analysis, meta-analysis

## Research Focuses

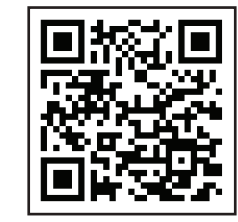
- HIV epidemiology and treatment outcomes and infectious disease related
- Mental health and social sciences
- Life expectancy and excess mortality
- Applied machine learning for predictive model in healthcare



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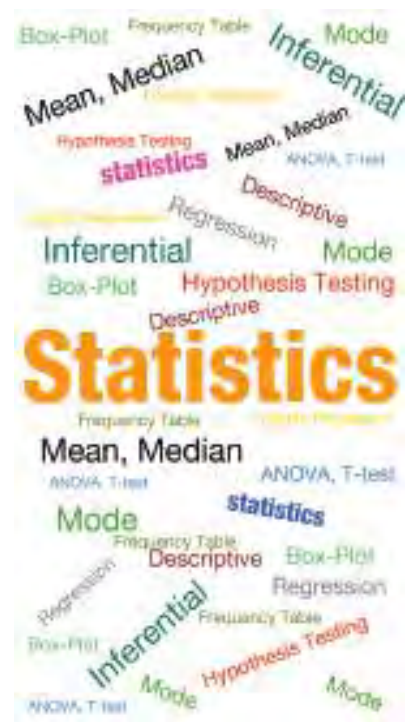


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## Publication

- Life expectancy of HIV-positive people after starting combination antiretroviral therapy: a meta-analysis (2017).
- Life expectancy after initiation of combination antiretroviral therapy in Thailand (2017).
- Virological failure and treatment switch after ART initiation among people living with HIV with and without routine viral load monitoring in Asia (2022).
- Long-term outcomes of rapid antiretroviral NNRTI-based initiation among Thai youth living with HIV: a national registry database study(2023).





# Asst. Prof. Sudarat Nidsunkid

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## Keywords

Statistical Quality Control,  
Multivariate Control Charts,  
Path Sampling



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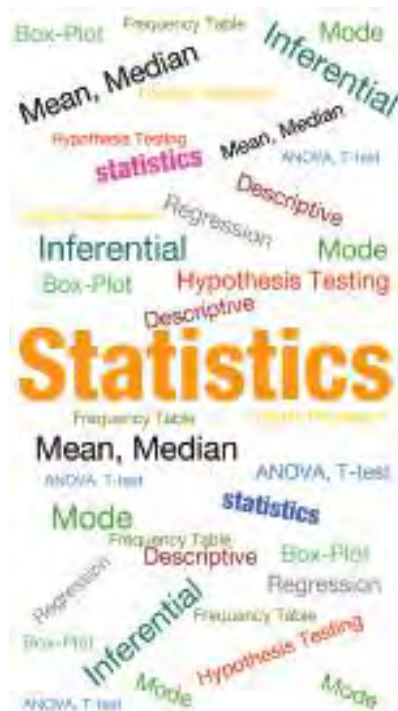


## Research Focuses

- Statistical Quality Control, Sampling Techniques

## Publication

- The impact of a random vector with variables from normal and non-normal distributions on multivariate control charts
- A Regression Estimator in Path Sampling
- The Average Run Length Performance of Shewhart Control Chart when the Process Data are Sampled from Finite Population
- A ratio estimator in path sampling





# Asst. Prof. Thidaporn Supapakorn

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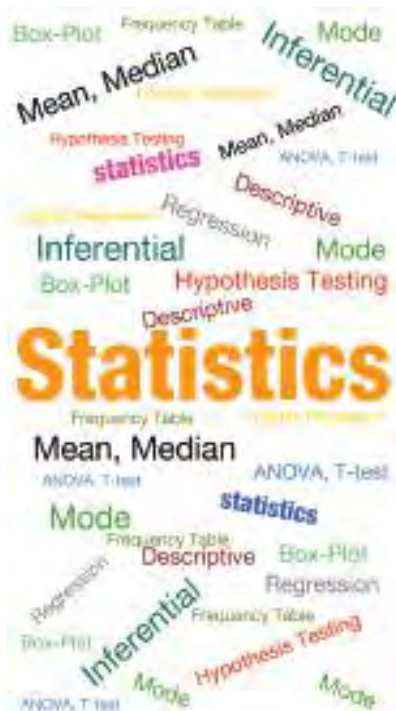


### Research Focuses

- Statistical modeling
- Inferential statistics
- Statistics in applications

### Publication

- Buathong, K.; Moonchai, S.; Saenton, S.; Supapakorn, T.; Rojsiraphisal, T. Predictive Model for Northern Thailand Rainfall Using Niño Indexes and Sea Surface Height Anomalies in the South China Sea. *J. Mar. Sci. Eng.* 2024, 12, 35.
- Boonmeekham, A., Sinsomboonthong, J., & Supapakorn, T. (2023). Exact Moments of Generalized Akash Order Statistics. *Thailand Statistician*, 21(4), 735–758.
- Arisa Jiratampradab, Thidaporn Supapakorn\* and Jiraphan Suntornchost (Dec 2022) Comparison of confidence intervals for variance components in an unbalanced one-way random effects model. *Statistics in transition new series*, 23(4), pp.149–160.





# Asst. Prof. Wandee Wanishsakpong

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## Keywords

Applied Statistics Modelling,  
Time series analysis



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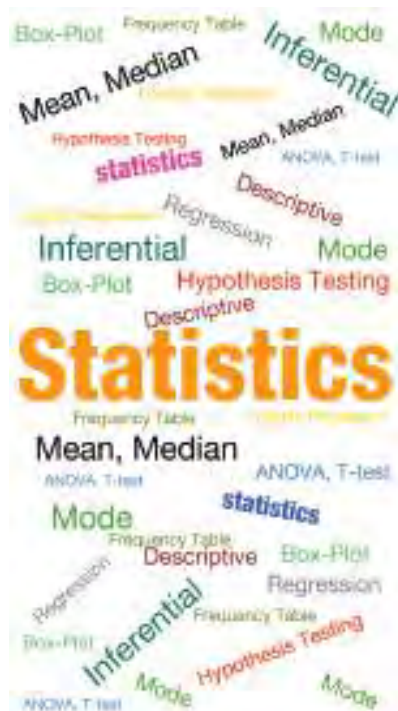


## Research Focuses

- Applied Statistics and Data Science

## Publication

- Wanishsakpong, W., Sodrung, K., and Thongteeraparp, T. (2023). A Comparison of Nonparametric Statistics and Bootstrap Methods for Testing Two Independent Populations with Unequal Variance. *International Journal of Analysis and Applications* 21–36
- Wanishsakpong, W., Thaithanan, J., Owusu, B.E., and Mahama, T. (2022). Comparing the efficiency levels of Multiple Comparison Methods for Normal Distributed Observations. *International Journal of Mathematics and Computer Science*, 17(1). 469–483.
- Wanishsakpong, W and Owusu, B.E. (2019). Optimal time series model for forecasting monthly temperature in the southwestern region of Thailand. *Modeling Earth Systems and Environment*.  
Doi: 10.1007/s40808-019-00698-5.







# Assoc. Prof. Winai Bodhisuwan

Department of Statistics

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## Keywords

Count data modelling, T-X family, Discretization of distribution



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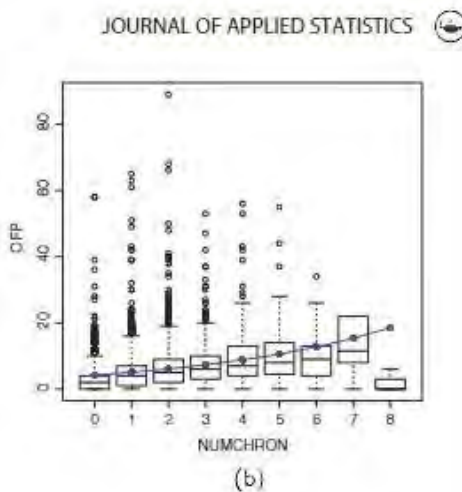
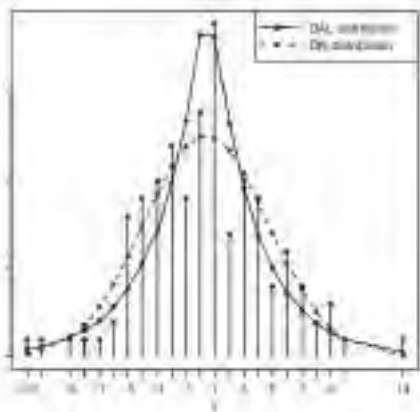


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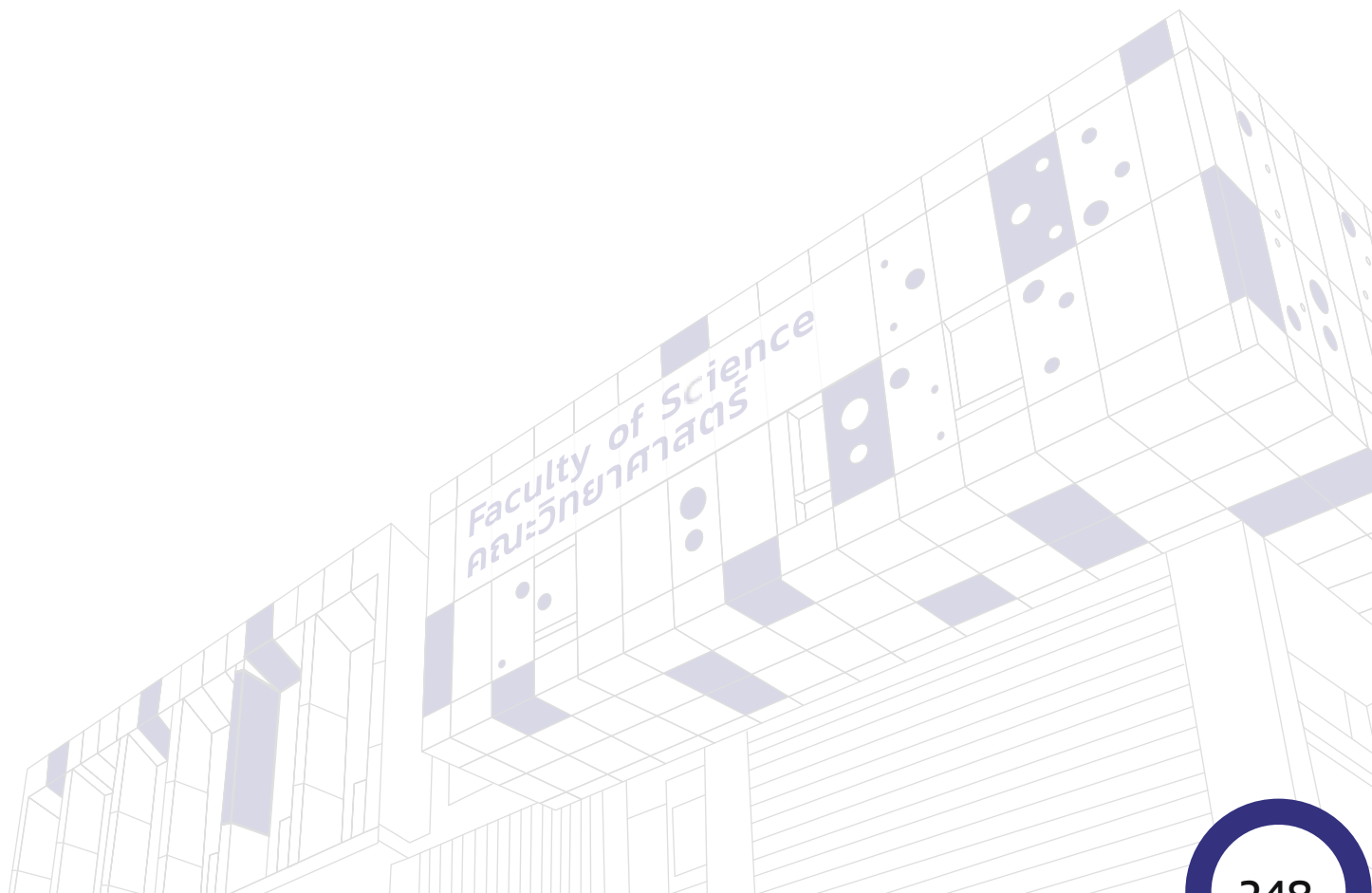
## Research Focuses

- Development of new probability distributions. They are extended in areas of T-X family of distributions, discrete-analogue distributions. Those are applied in many fields. Also, some count data models are developed and applied to real life problems. Some problems of count data models are discussed, such as, zero inflation, zero truncation, zero-one inflation.



# 8

## WASTE AND CIRCULAR ECONOMY INNOVATIONS



## WASTE AND CIRCULAR ECONOMY INNOVATIONS

At the Faculty of Science, Kasetsart University, our research in waste and circular economy innovations is focused on transforming forestry residues and textile waste into valuable resources. We explore the conversion of biomass into biofuels and composite materials, applying life cycle assessment to ensure sustainability. Our work with natural fibers and metal-organic frameworks (MOFs) advances the fields of gas storage, separation, and catalysis.

We are pioneering materials upcycling and the development of 2D materials-based catalysts. Our expertise extends to environmental radiation measurement, dose assessment, and the utilization of radon and thoron monitoring techniques. Through interdisciplinary collaboration, we aim to create sustainable solutions that promote a circular economy, turning waste into resources and minimizing environmental impact. By integrating advanced materials science with innovative waste management practices, we strive to contribute to a greener, more sustainable future.



# Dr.Kuntawit Witthayolankowit

Department of Chemistry

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## Keywords

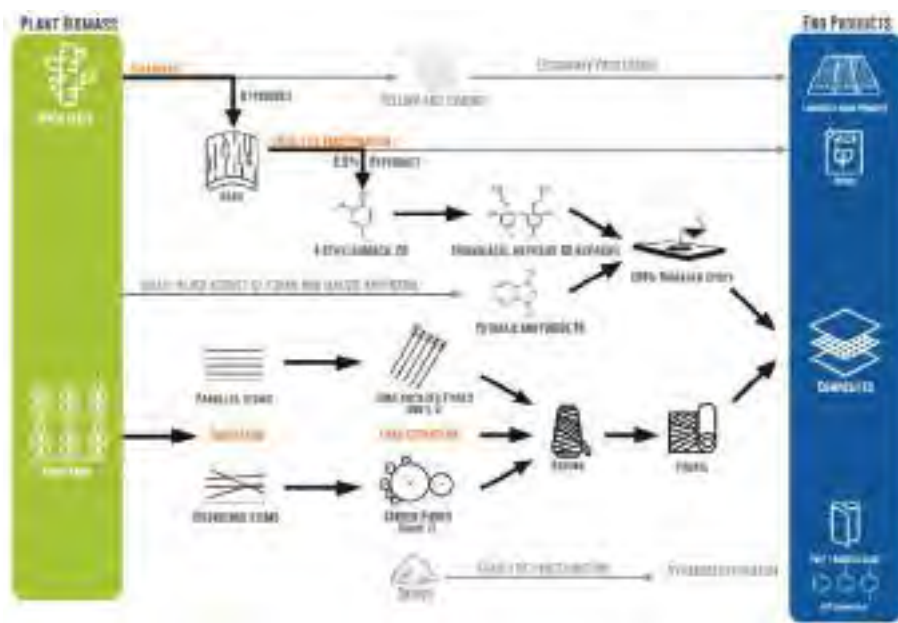
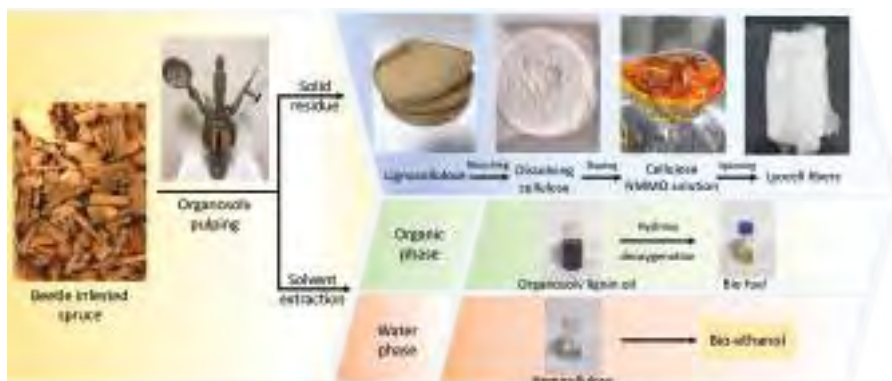
Forestry residue valorization, Textile fibers, Biofuels, Life cycle assessment, Waste textile, Natural fibers.

## Research field

- Biomass valorization
- Lyocell production
- Lignin oil upgrading



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# Asst. Prof. Raminda Rattanakam

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## Keywords

Biomass Conversion, Composite materials, Metal-organic frameworks, Biomaterials, Gas storage and separation, Catalysis



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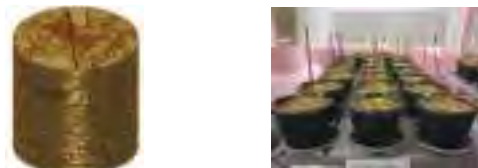


### Functional Materials from Biomass

- Biophosphate fertilizer from fish scales

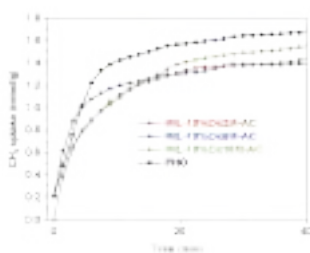
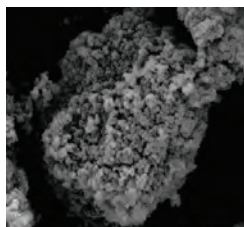


- Fertilizer-loaded biochar

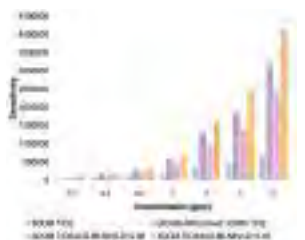


### MOF Composites

- MIL-101/Activated carbon composite

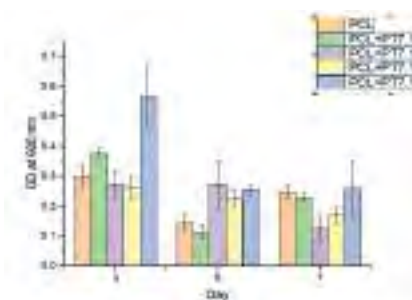
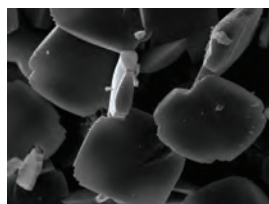


- NH<sub>2</sub>-UiO-66/TiO<sub>2</sub> composite



### Biomaterials

- MOFs for bone regeneration





# Assoc. Prof. Tanwawan Duangthongyou

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## Keywords

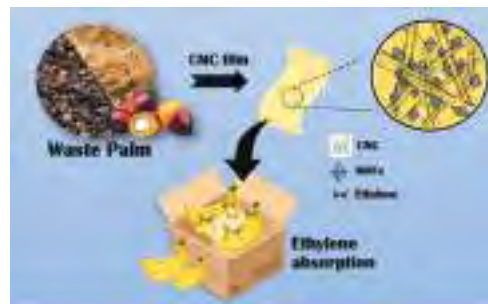
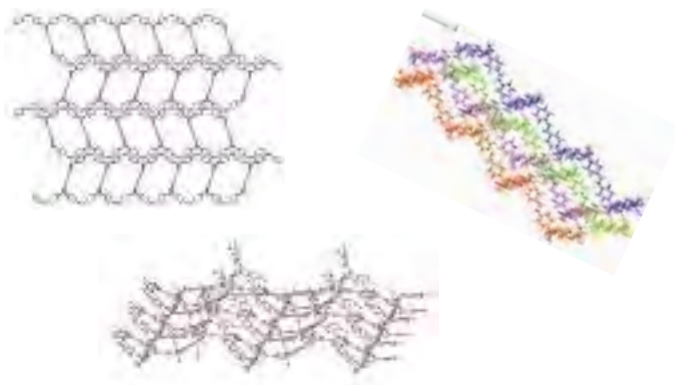
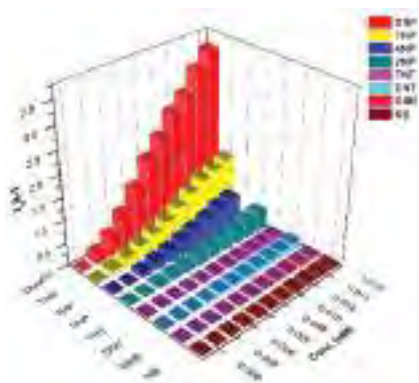
Metal organic framework, Coordination Polymer, Crystal structure determination

## Research field

- Design and Synthesis MOFs or Coordination Polymers, MOFs or CPs Application for Sensor and Agriculture
- Synthesis fluorescence MOFs for detection of metal ions, nitroaromatic compounds or nitrofuran antibiotic group
- Extract cellulose or chitin from agricultural waste and preparation MOF@CMC or chitosan film for using delay ripening of fruit



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# Assoc.Prof. Weekit Sirisaksoontorn

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## Keywords

Materials Upcycling,  
2D Materials-Based Catalysts



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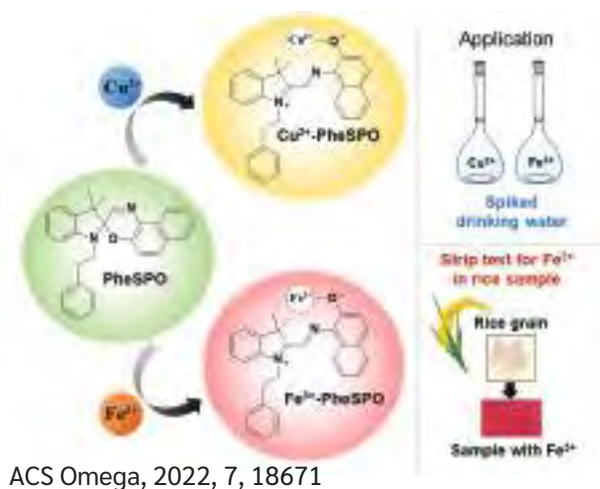
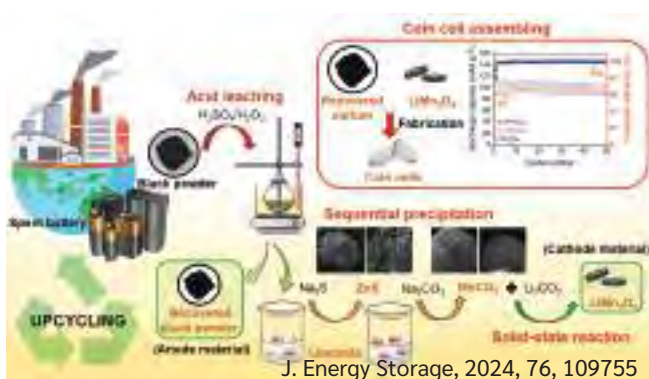
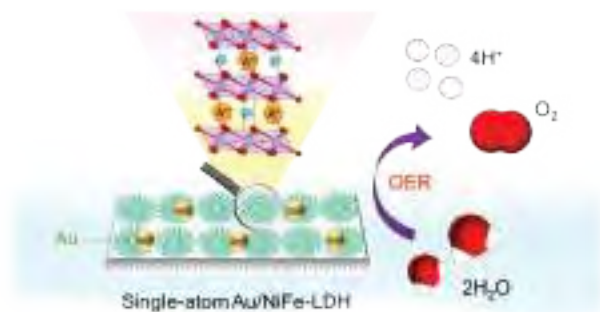


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## Research Field

- Upcycling of spent primary batteries toward the rechargeable battery and supercapacitor applications.
- Advancing 2D materials as electrocatalysts toward HER and OER applications
- Developing the spirooxazinemolecular sensors for heavy metal detection





# Asst. Prof. Chanis Rattanapongs

Department of Applied Radiation and Isotopes

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## Keywords

Radon, Thoron, Environmental radiation measurement, Dose assessment

## Research Focuses

- Measurement of the amount of radiation in the environment
- Analyze the amount of radiation contaminants in industry and food.
- Radiation dose assessment for radiation safety
- Radioactive waste management and industrial waste pretreatment
- Development of an instrument calibration system to measure
- airborne radiation and aerosol radioactive particles.



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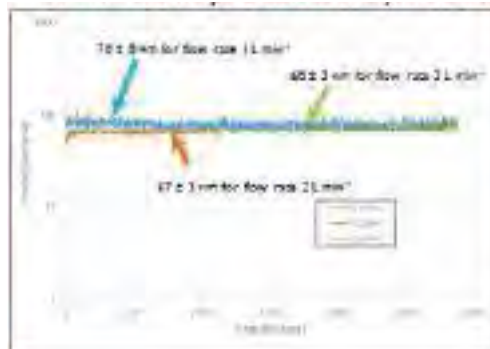
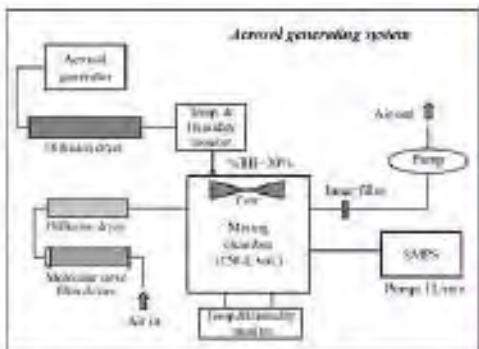
Radon-thoron and decay products monitoring device



Radiation dose assessment on site study



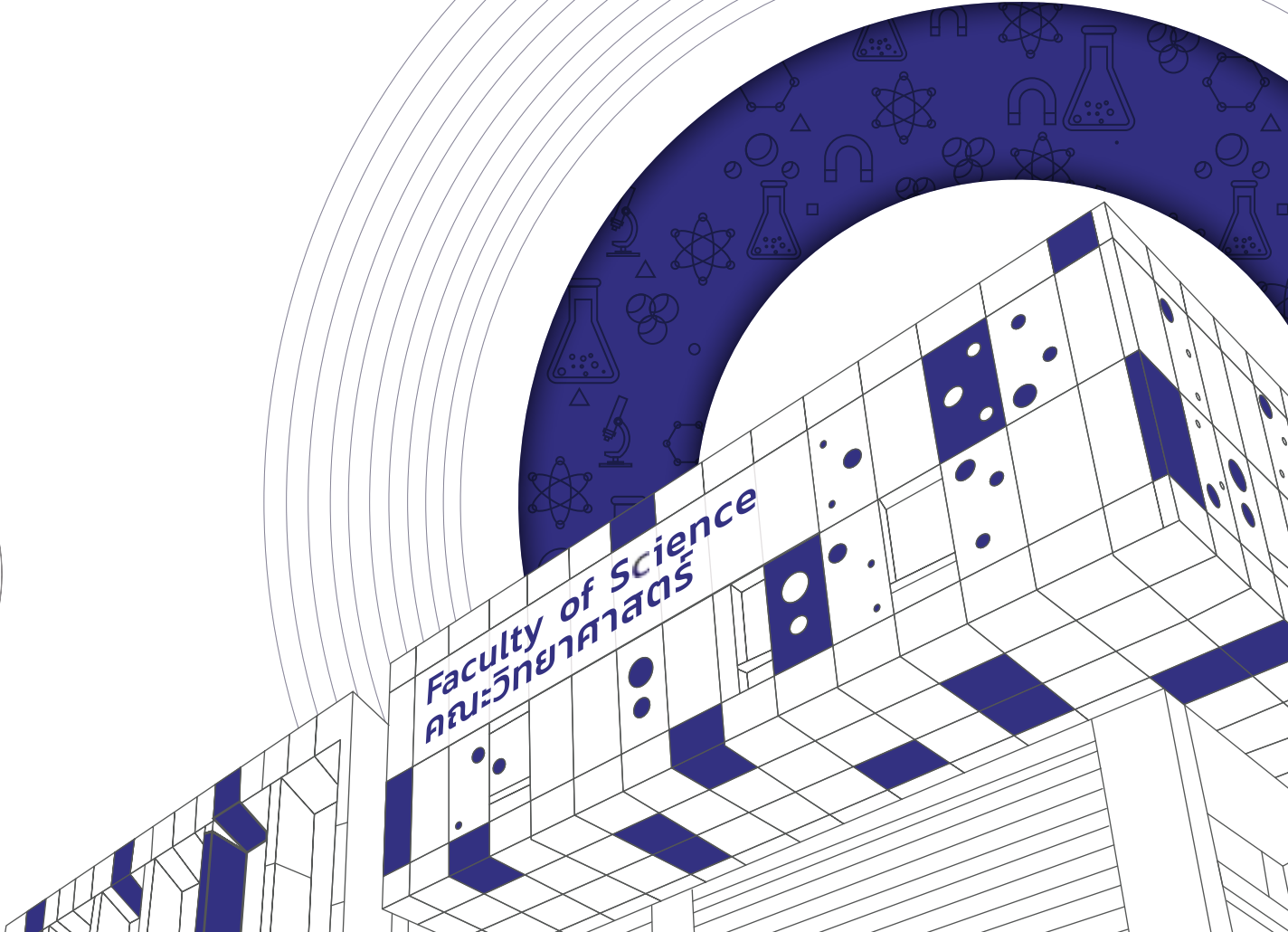
Aerosol generator calibration system for measuring radioactive particles







# คณะวิทยาศาสตร์ มหาวิทยาลัยเกษตรศาสตร์



Faculty of Science  
คณะวิทยาศาสตร์

A 3D wireframe illustration of a building facade, tilted upwards. The building is composed of white and dark blue geometric shapes. The text "Faculty of Science" and "คณะวิทยาศาสตร์" is written on the side of the building. The background behind the building is a dark blue semi-circle filled with various white scientific icons, including a microscope, a beaker, a flask, a magnifying glass, a DNA helix, and a chemical structure.

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