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Thank You
Malaysian Rubber Council

Prof. Ir. Ts. Dr. Show Pau-Loke
University of Nottingham, Malaysia (UNM)

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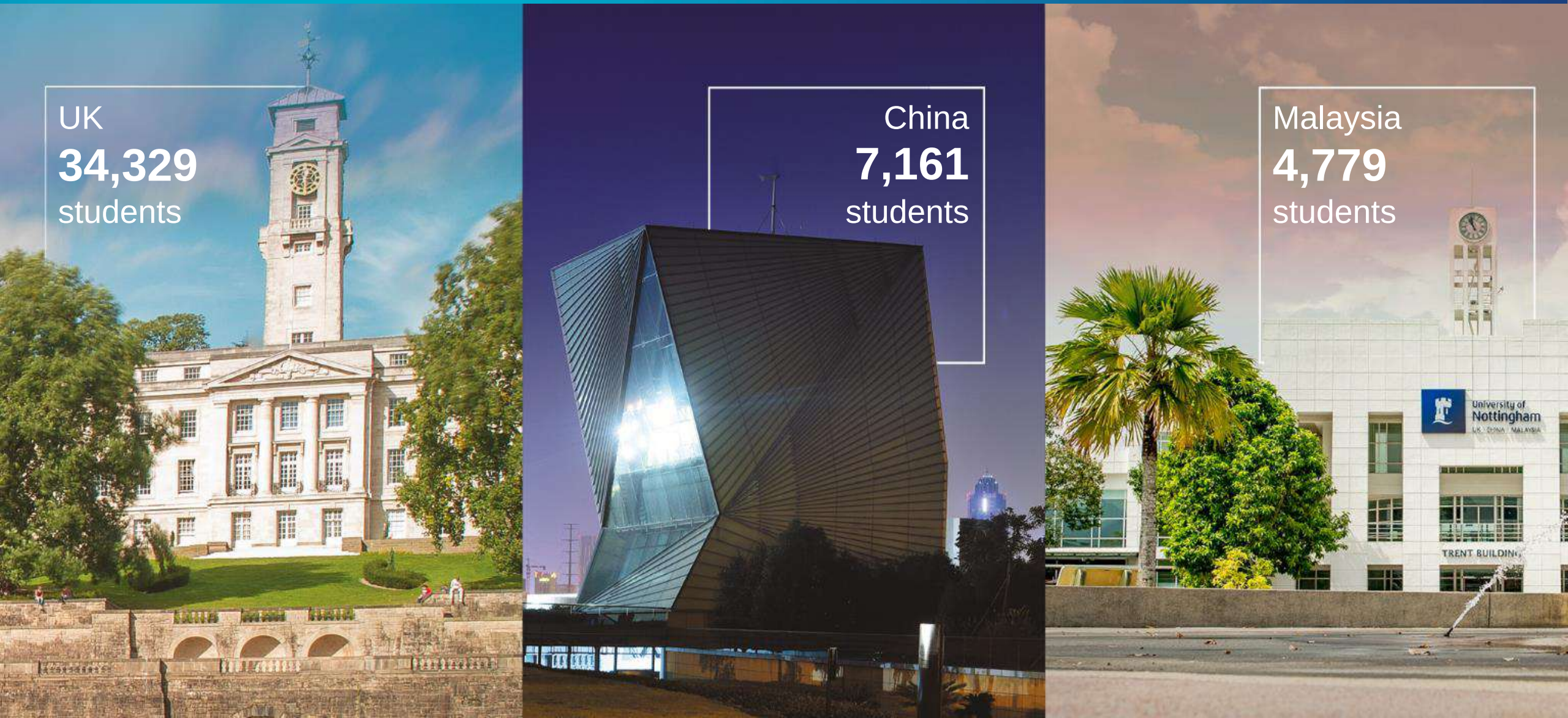
A Global University



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Our position

The University of Nottingham is in the **top 100 universities worldwide**

QS World University Rankings 2017

Global networks and collaborations

8th in the UK for research power in the latest Research Excellence Framework - *(REF) 2014*

More than **97%** of research at the University is internationally recognised

Research portfolio worth more than **£600m**

World-class facilities

Over **3,000** researchers

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Mission-driven public good

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Investing in our research ecosystem

Beacons of Excellence

World-class researchers/100 Nottingham Fellows

International collaboration

University of Nottingham Policy and Engagement Institute

Industrial collaboration/ commercialisation

Transdisciplinary research

A world-class environment

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Department of Chemical and Environmental Engineering

Process Synthesis and Optimisations

1. **Wastewater treatment**
   - ✓ Design new wastewater treatment system.
   - ✓ Upgrade and troubleshoot existing wastewater treatment.
   - ✓ Study on removal of heavy metal and halogen groups chemical elements.
   - ✓ Drying of sludge.

2. **Energy Saving**
   - ✓ Optimise processes in rubber industry to reduce energy consumption.
   - ✓ Provide a decision maker tool to aid company owner to make decision in optimising their processes to reduce energy saving and increase economic performance.

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2-stage drying of crumb rubber

Drying of crumb rubber

1st stage Vacuum Drying

2nd stage Hot Air Drying in intermittent mode

1. 1st stage vacuum drying helps to remove surface moisture
2. 2nd stage hot air drying in intermittent mode facilitates slow diffusion of moisture from internal to surface; hence save energy and operating cost
3. Colour change of product reduced significantly
4. Gave better textural attributes (moderate hardness and high stickiness).

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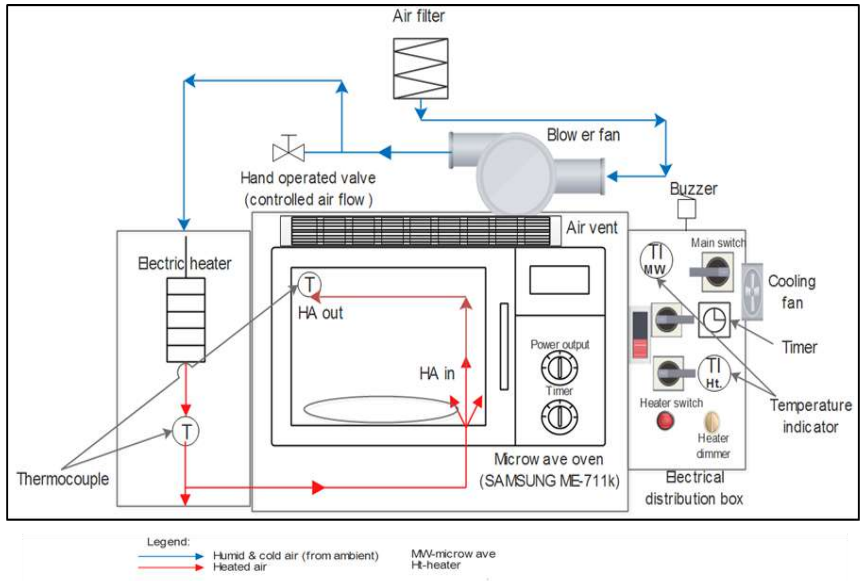
Hybrid microwave convective drying of crumb rubber



1. 90% faster than conventional hot air drying
2. Significant saving (about 50%) in energy consumption.
3. Conventional high temperature drying: 0.36-0.44 MJ/gH2O
4. MW convective drying: 0.22 MJ/gH2O
5. Better resistance against deterioration during ageing and processing

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Soft materials and biocomposites Research Group

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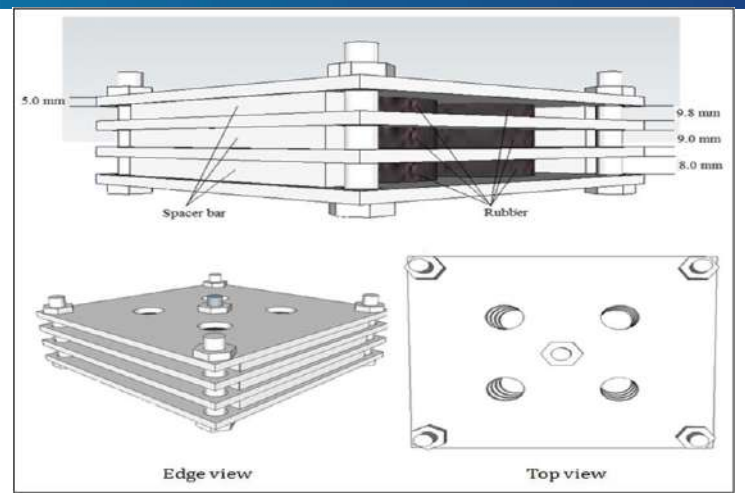
Soft materials and biocomposites Research Group


Natural rubber


Eggshell powder


Oil palm fiber

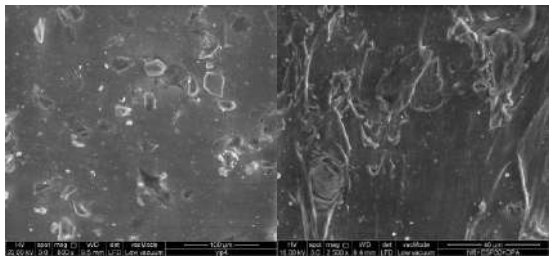

Oil palm ash

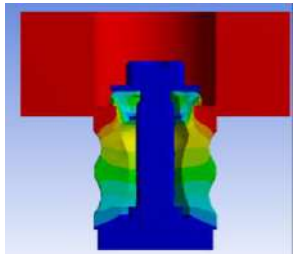


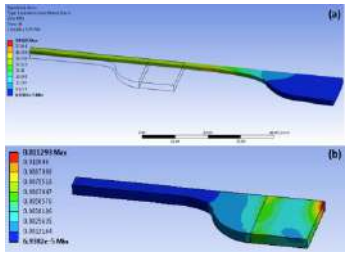
Compounding of soft materials and biocomposites from waste materials

Mechanical characterization of biocomposites via various experimental works

Development and application of experimental testing and modeling for durable and robust end products







[Contact: Dr Chai Ai Bao](mailto:AiBao.Chai@nottingham.edu.my) (AiBao.Chai @nottingham.edu.my)

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Prof Ir Ts Dr Show Pau-Loke Ph.D, CEng, PEng, MIChemE, FHEA
周柏乐

- ✓ President of International Bioprocess Society
- ✓ Director of Sustainable Bio-Processing Research Centre
- ✓ Co-director of Future Foods Malaysia Beacon of Excellence
- ✓ Professor, Department of Chemical and Environmental Engineering, Faculty of Science & Engineering.
- ✓ Ph.D in Bioprocess Engineering (2010-2012)
- ✓ Fellow of Higher Education Academy (FHEA), PGCHE (2012 – 2014)
- ✓ Chartered Chemical Engineer, Institute of Chemical Engineer, UK.
- ✓ Professional Engineer & Professional Technologist
- ✓ Areas of Interest
  - ✓ Bioprocess from Upstream to Downstream
  - ✓ Extraction, Recovery, Separation and Purification Technology
  - ✓ Microalgae Research

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RESEARCH ACHIEVEMENTS

1. Published 500+ high impact papers in < 8 years
2. Successful secured >25 research grants
3. Tan Sri Emeritus Professor Augustine S H Ong International Special Award on Innovations and Inventions in Palm Oil 2021
4. The APEC Science Prize for Innovation, Research and Education (ASPIRE) Malaysia Award 2020
5. ASEAN Scholar Award 2019, India.
6. Malaysia National Young Scientist Award 2019 from MOSTI, Malaysia
7. Global Top Peer Reviewer Awards 2019 from Web of Science
8. The DaSilva Award 2018 from Society for Biotechnology, Japan.
9. JSPS Fellowship 2018 from Japan Society for the Promotion of Science, Japan.
10. Bioresource Technology, Elsevier, Top Reviewer Award 2017.
11. Top 100 Asian Scientists 2017
12. Asia's Rising Scientists Award 2017
13. Winner, Young Researcher Award, IChemE Malaysia Award 2016
14. Platinum Research Award

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13 PhD & 4 MSc Students (On-going)


Apurav Krishna Koyande

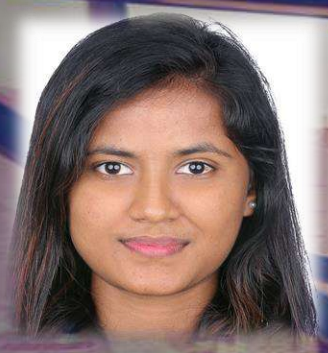

Sze Yin Cheng


Azim


Doris Tang


Chia Wen Yi (Kathlyne)


Nurul Syahirah


Angela Paul Peter


Lim Hooi Ren


Vishno Vardhan


Lau Zhi Lin


Zhuang Dingling


Yongqiu Cai


Chan Sook Sin

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12 Members (Completed PhD)

Professor Ir Ts. Dr. Pau Loke Show

Dr Chew Kit Waybne

Dr. Leong Yoong Kit

Dr. Lee Sze Ying

Dr Revathy Sankaran

Dr Chung Hong Tan

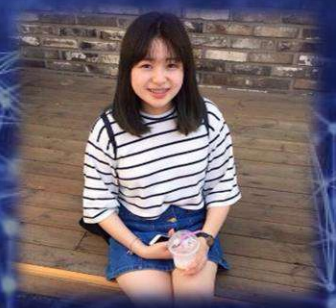
Dr Chioma Ewurum

Dr Isabelle Hui Yi Leong

Dr Wai Yan Cheah

Dr Shir Reen Chia

Dr Yew Guo Yong



Dr Yu Kai Ling

Dr Jerry Khoo Kuan Shiong

Waste-to-Wealth

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Microalgae to valuable products

Food

Bio-Energy

Rubber

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Algal Vulcanization of Natural Rubber: Latex & Synthetic Latex

Algae

Algae compounds: Agar & alginate, etc

Better cost & mechanical strengths

Bio-gloves

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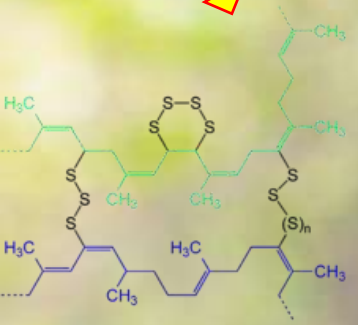
Algal Vulcanization of Natural Rubber: Latex & Synthetic Latex

Wastewater

Microalgae

Antioxidant agent



Cross Linker

Anti Tack Agent

Natural color pigment

Compound ‘X’

- Targeting a short duration to produce a prototype formulation.
- With high commercial value.
- Able to apply in large production scale.

1. Anti-microbial properties
2. Crosslinking ability
3. Natural coloring for the rubber glove
4. Compound ‘x’ with antioxidant properties
5. Enhanced the anti-tacking capability

Bio-Spray Glove

Spray formulation

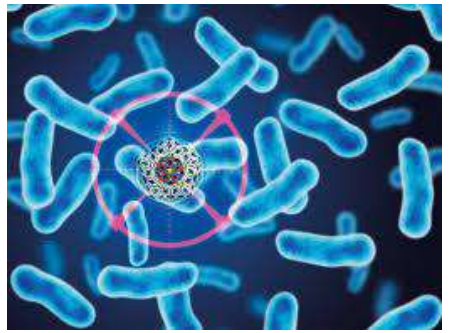
Spray: Fast drying, shape formation

Spray-on gloves

Other applications

Virus direction Glove

Healthcare workers



Exposure to virus and spreading from inappropriate disposal method

Viral detection and prevention gloves

Health and well-being

Some published works in international journal

Materials Today Communications 19 (2019) 39–50

Contents lists available at ScienceDirect

Materials Today Communications

journal homepage: www.elsevier.com/locate/mtcomm

Emerging crosslinking techniques for glove manufacturers with improved nitrile glove properties and reduced allergic risks

Guo Yong Yew[a], Thing Chai Tham[a], Chung Lim Law[a], Dinh-Toi Chu[b,c], Chiaki Ogino[d], Pau Loke Show[a,*]

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[b] Faculty of Biology, Hanoi National University of Education, 136 Xuan Thuy, Cau Giay, Hanoi, Viet Nam

[c] Institute for Research and Development, Duy Tan University, Danang, Viet Nam

[d] Department of Chemical Science and Engineering, Graduate School of Engineering, Kobe University, 1-1 Rokkodai, Nada, Kobe, 657-8501, Japan

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International collaboration

Delivering
globally significant Research

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International Research Collaborators


Taiwan


New Zealand


US

Portugal

National Cheng Kung University 1931
Yuan Ze University 1989
YunTech 國立雲林科技大學
THE UNIVERSITY OF WAIKATO
Te Whare Wānanga o Waikato
NREL NATIONAL RENEWABLE ENERGY LABORATORY
PATH
universidade de aveiro

China


Japan

Others:

VIT UNIVERSITY (Estd. u/s 3 of UGC Act 1956)
University of Nottingham UK | CHINA | MALAYSIA
The University Of Sheffield.
MONASH University

Chongqing University 1929
Wuhan University
JAIST Japan Advanced Institute of Science and Technology 1990
KOBE University
東京大学 The University of Tokyo
Chiang Mai University 1964

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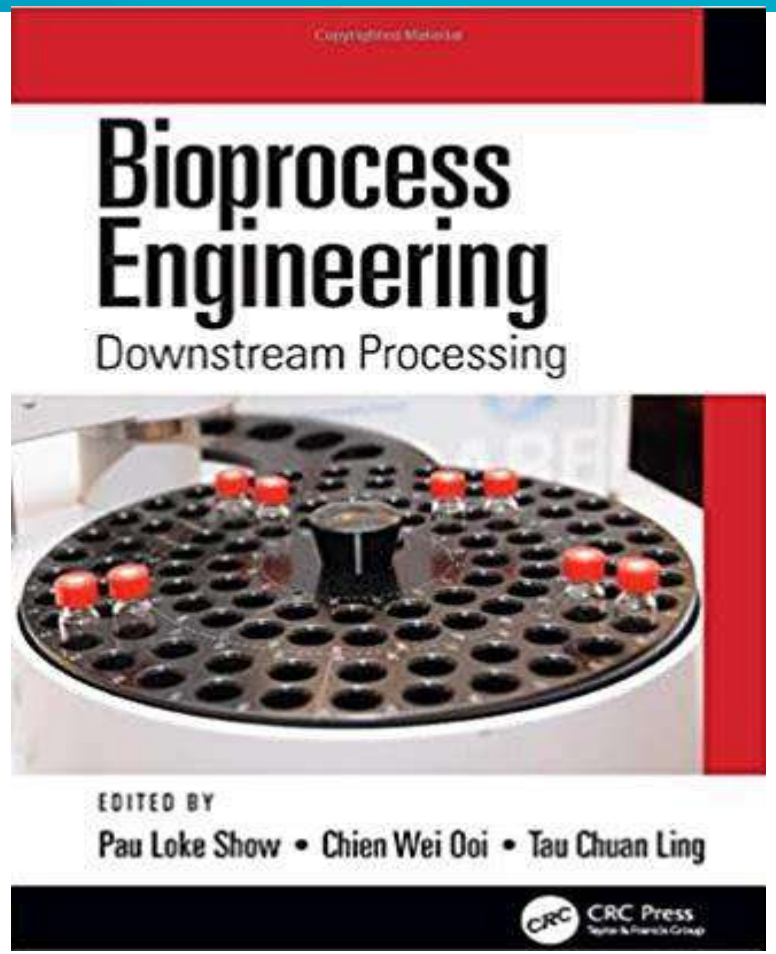
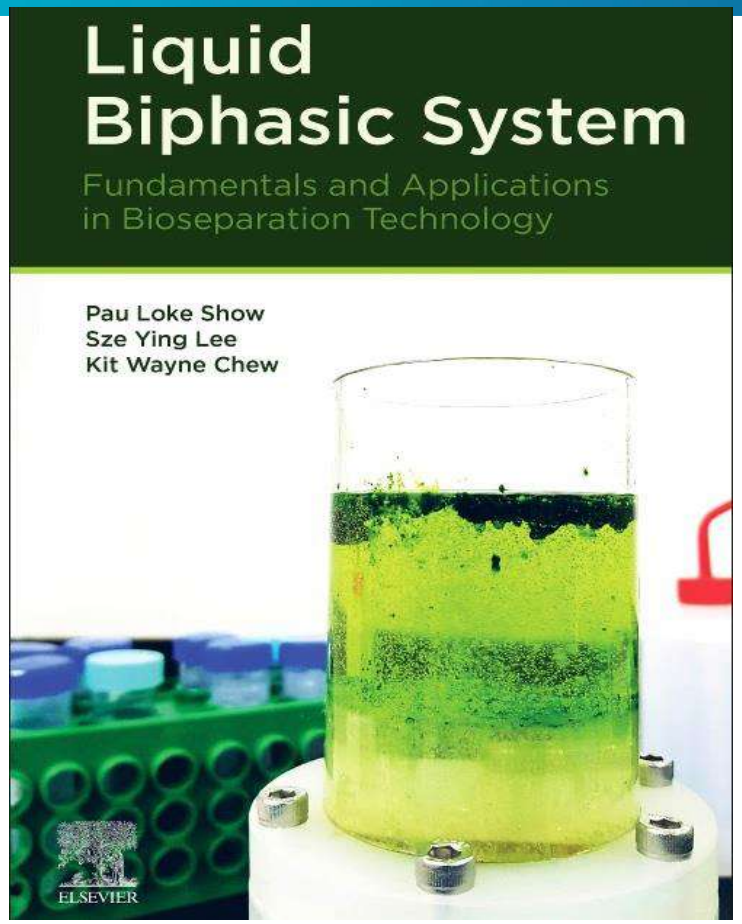
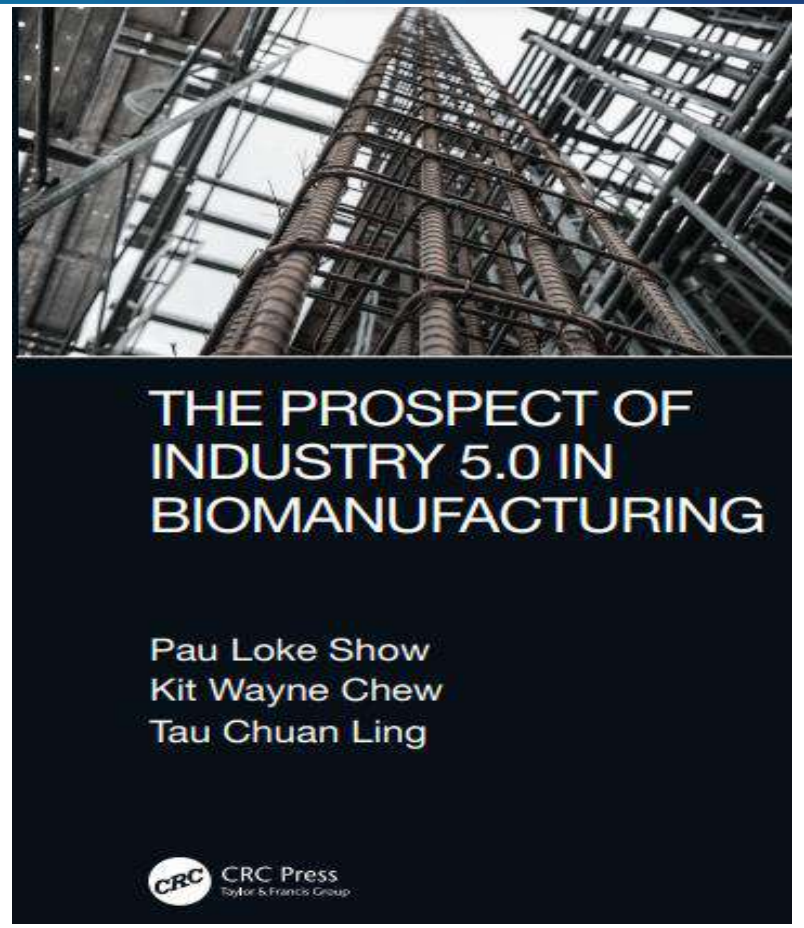
Our New Books



Pau Loke Show, Chien Wei Ooi, Tau Chuan LingBioprocess Engineering: Downstream Processing,, *CRC Press*, 2019



Pau Loke Show, Sze Ying Lee, Kit Wayne Chew, Liquid Biphasic System: Fundamentals and Applications in Bioseparation Technology, *Elsevier*, 2020



Pau Loke Show, Kit Wayne Chew, Tau Chuan Ling, The Prospect of Industry 5.0 in Biomanufacturing, *CRC Press*, 2021

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Discover more

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THANK YOU!