

BioPRIA NEWSLETTER

April 2023

Workshop participants welcomed with excitement and engaging sessions

BioPRIA kicked off the year with the “*Engineering Plant Biomaterials for Advanced Manufacturing Workshop*” at New Horizons, Clayton campus. We welcomed 50 delegates including international technical experts, academics and industry key players to discuss the current state-of-the-art research in plant-based biomaterials and moving towards more sustainable product manufacturing.

The day featured a number of keynote presentations and panel discussion. These sessions provided opportunities for the participants to hear directly from experts’ perspectives and their experiences on sustainability and innovation in product development. A breakout session was followed and led by Dr Virginie Chambost. Here, the groups discussed the industrial advancements and needs, identified the challenges, opportunities and commonalities between university-based research and industry needs.

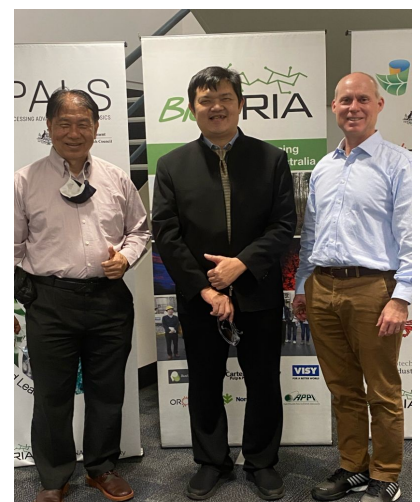
At the end of the day, BioPRIA Director, Prof Gil Garnier closed the workshop and thanked everyone for attending and sharing their insights and experiences.

We want to thank everyone who made this workshop such a success, including all speakers (Prof. Florent Allais, Prof. Orlando Rojas, Dr. Billy Bardin, Prof. Paul Stuart, Dr. Virginie Chambost, Dr. Wade Mosse, Dr. Debjani Ghosh, Tim Davey, Daniel Kaminski, Jim Manolios) and participants who brought so much energy on the day.

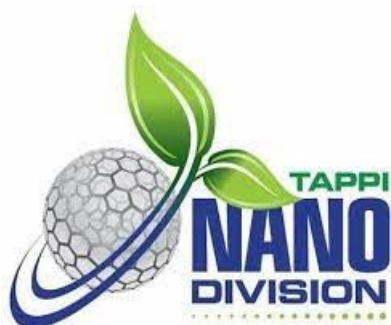


BioPRIA welcomed BMJ Indonesia

BioPRIA was visited by Liem Khe Fung and Dr Yalun Arifin from BMJ Indonesia, who were interested in packaging and keen to discuss innovation beyond paper. They were given a tour of laboratories and facilities, and learnt more about our capabilities and research activities.



TAPPI Nano Conference 2023, Vancouver BC, June 12-16



Check out the upcoming 2023 TAPPI Nanotechnology Conference to learn about the latest advancements in research and actual applications of renewable nano-materials. [Click here for event and program details.](#)

BioPRIA representatives will be there to showcase our research outcomes:

- How Electrolytes Vary the Suspension Structure of Cellulose Nanocrystals (Dr Christine Browne)
- Controlling Droplet Contact Angle with Micropatterned Nanocellulose Films (Dr Christine Browne)
- High-Barrier Plasticized Cellulose Nanocrystal Film (Naghmeh Nasiri)
- Physical Properties of Spray-Deposited Nanocomposite Sheets Based on Cellulose Nanofiber and Lignin Particle (Yasuaki Inoue)
- Barrier Properties of Nanocellulose Films (Hans Cainglet)

Congratulations to our PhD Graduates

We were delighted to celebrate the achievement of Dr David Mendoza, Dr Maisha Maliha and Dr Mostafa Dehghani who attended the graduation ceremony in person in October 2022.



We also extend our congratulations to the following who have recently completed their PhDs:

- Dr Maoqi Lin “ Modulating Nanoarchitectures And Properties Of Self Assembled Cellulose Nanocrystal Composites “. Supervisors: Prof. Gil Garnier and Prof. George Simon.
- Dr Stefan Buerghmyar, “Vacuum evaporation of process water from recycled containerboard mills”. Supervisors: Prof. Andrew Hoadley, Dr. Joanne Tanner, A/Prof. Warren Batchelor.
- Dr Debjani Ghosh, “Novel applications of hemicellulose from lignocellulose waste”. Supervisors: Prof. Tony Patti, Prof. Gil Garnier.
- Dr Poornima Vijay, “Green oxidation of lignocellulose to obtain nanocellulose and its applications”. Supervisors: Prof. Kei Saito, A/Prof. Warren Batchelor.
- Dr Diana Alves , “ New Concepts Of freeze-drying Human Red Blood Cells in Pre-Transfusion Medicine” . Supervisors: Prof. Gil Garnier and Adjunct Assoc Prof. Rosemary Sparrow.

We wish them all the very best of success in their future endeavours.

Latest Publications

Lin, M., Raghuwanshi, V.S., Browne, C., Simon, G.P. and Garnier, G., 2023. **Tailoring the humidity response of cellulose nanocrystal-based films by specific ion effects.** *Journal of Colloid and Interface Science*, 629, pp.694-704.

P.S. Roy, M. M. Mention, A. F. Patti, G. Garnier, F. Allais, K. Saito. **Photo-responsive lignin fragment-based polymers as switchable adhesives.** *Polym. Chem.*, 2023, 14(8), 913-924. DOI: [10.1039/D2PY01474B](https://doi.org/10.1039/D2PY01474B)

Browne, C., Hertaeg, M.J., Mendoza, D.J., Naseri, M., Lin, M., Garnier, G. and Batchelor, W., 2023. **Micropatterned cellulosic films to modulate paper wettability.** *Colloids and Surfaces A: Physicochemical and Engineering Aspects*, 656, p.130379.

Raghuwanshi, V.S., Browne, C., Batchelor, W. and Garnier, G., 2023. **Self-assembly of cellulose nanocrystals of different lengths.** *Journal of Colloid and Interface Science*, 630, pp.249-259.

Miri, S., De Girolamo, A., Nadeem, H., Chin, B.W.X., Hora, Y., Andrews, P.C. and Batchelor, W., 2023. **Composite membranes of cellulose–mesoporous silica: optimization of membrane fabrication and adsorption capacity.** *Cellulose*, 30(1), pp.339-357.

AINSE Postgraduate Research Award (PGRA)

From the 1st - 4th of September 2022, our PhD candidate Gloria Diaz working under the supervision of Dr Joanne Tanner conducted small angle neutron scattering (SANS) measurements at the Australian Nuclear Science and Technology Organisation (ANSTO). Gloria was a recipient of the AINSE Postgraduate Research Award (PGRA) which gives a top-up stipend and provides travel support to postgraduate students conducting research at ANSTO facilities. She was also selected to attend the Small Angle Scattering workshop 2022 from the 15th to 17th of November held at the ANSTO facilities in Lucas Heights NSW. "Attending the SAS workshop 2022 not only provided me with the opportunity to gain relevant understanding and skills to interpret the resulting data from the conducted SANS experiments but also, it allowed me to exchange inspirations and ideas with researchers and top scientists across Australia."



Using the Bilby-SANS instrument, our researchers aimed at elucidating the molecular size of bio-functional oligomers derived from hemicellulosic biomass. These oligomers termed xylooligosaccharides (XOS) possess applications linked to their degree of polymerisation. Currently, there are no large-scale production processes for these oligosaccharides as their separation is a challenging step. Understanding the morphology of XOS in solution is particularly relevant to developing separation methods that quantify the trade-off between selectivity and productivity. SANS measurements will contribute to the effort of producing XOS components with high purity at a large scale to make them accessible for further investigation of their biological activities and commercial applications.

Congratulations Scot!

Congratulations to Scot Sharman on receiving the **Dean's Award for Occupational Health and Safety** from the Faculty of Engineering—Well done Scot!



Visiting Researcher – Celestin Bourgerly (URD ABI France)



Last October we welcomed Célestin to BioPRIA for a two month visit. Célestin is a PhD student at the beginning of his 3rd year, in the URD ABI (France), under the supervision of Prof Florent Allais and Dr Louis Mouterde. His research focuses on enzymatic synthesis, purification and immobilization of coenzymes of interest. The purpose of his visit to BioPRIA are related to the immobilization of cofactors on CNCs, using click chemistry, under the supervision of Prof Gil Garnier and Dr David Mendoza. The objective is to provide a new access to some enzymatic cofactors, in order to establish new applications, easy recycling and regeneration, and thus participate in the development of biocatalysis. We are delighted to be collaborating again with the ABI URD.

Farewell to Colleague



We farewelled Mostafa Dehghani at the end of November. Mostafa was a PhD student here at BioPRIA under the supervision of A/Prof Warren Batchelor. Upon his completion he became a Research Fellow at BioPRIA under the supervision of Prof Gil Garnier and A/Prof Warren Batchelor. He has moved into industry as a Process Engineer.

Congratulations and we wish Mostafa all the very best in his new role.

Congratulations!

Our congratulations to Vikram and Sushma who welcomed baby Shiv into the world in early February. Such exciting news!



Rosi and Kris are also delighted to announce the birth of their baby boy Nathan in September 2022. Wonderful news and very exciting for big sister Grace!



Welcome!

We are pleased to welcome two new PhD candidates, **Jayalakshmi Jayaprakash** and **Jie-Ning Chuang** to the BioPRIA team. Jayalakshmi will be working on sustainable production of Polyhydroxyalkanoate (PHA) biopolymeric materials, under supervision of A/Prof. Victoria Haritos and Prof. Gil Garnier. While Jie-Ning's project will focus on applying phage-assisted continuous evolution (PACE) for biosensing applications, with Prof. Gil Garnier, A/Prof. Simon Corrie, A/Prof. Sefi Rosenbluh, and Dr. Gavin Knott as his supervisors.

Would your company like to collaborate and discuss any research opportunities with us?

CONTACT BIOPRIA

Bioresource Processing Research Institute of Australia (BioPRIA)
Department of Chemical and Biological Engineering
15 Alliance Lane (Building 59), Clayton Campus
Monash University Victoria
Tel: (03) 9905 3456
Fax: (03) 99053413



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