

MASTER OF INDUSTRIAL RESEARCH

Project Title:

Development of Innovative Membrane Filtration Modules and Rack Assemblies for Water and Wastewater Treatment

Industry Supervisors:

James McMahon and Geoffrey Johnston-Hall,

[Dupont Water Solutions](#)

Academic Supervisors:

[Associate Professor Pierre Le-Clech, p.le-clech@unsw.edu.au](#)

[Professor Martina Stenzel, m.stenzel@unsw.edu.au](#)

School of Chemistry and School of Chemical Engineering, UNSW
[UNESCO Centre for Membrane Science and Technology](#)



Project Summary:

Compared to conventional water treatment technologies such as flocculation, sedimentation/clarification and sand filtration, membrane filtration can provide more reliable solids and pathogen removal, higher water quality, and lower costs over the lifetime of a plant. However, success depends on several product design factors including:

1. Materials of construction (i.e., materials chemistry),
2. The physical design (i.e., dimensions, and configuration), and
3. How membranes are configured into membrane 'modules' and filtration system 'racks'.

Within these design factors, DuPont Water Solutions (DWS) have identified the design and development of: (1) the next generation high performance modules, and, (2) low-cost rack assemblies used for water and wastewater treatment, as important areas that require additional R&D that will give them a future commercial advantage in this highly competitive market. The membrane technology market for both drinking water and wastewater treatment is competitive



with businesses competing on both product performance and price. The objective of this project is to design and develop a next generation membrane module and low-cost rack assembly. The key objectives of this project include:

1. Develop the next generation membrane filtration module for DWS
2. Investigate scale-up requirements to manufacture this product
3. Investigate the filtration performance of this product
4. Develop low cost rack assemblies



Scholarship:

This project is part of the [ARC Training Centre for the Chemical Industries](#) and offers the candidate to enrol into a [Master of Industrial Research \(Chemistry\)](#) for 18 months, with a scholarship of approximately \$33,000 pa.

Research Environment:

DuPont Water Solutions (DWS) is a global leader in purification and speciality separation technologies, providing state of the art membrane science and ion exchange solutions to homes, companies and communities, for clean safe drinking water production and wastewater treatment.



MIR candidates will be expected to principally carry out their research at DuPont Water Solutions' Windsor NSW research and manufacturing site. Some flexibility to allow some work from home days will be available in line with appropriate COVID 19 policies to ensure a safe working environment, and to support students completing their studies. The DuPont Memcor site in Windsor is principally a manufacturing facility.

The Candidate:

Candidates should ideally have a background in chemical engineering, or industrial chemistry, with knowledge of materials chemistry, membrane filtration, and an interest in the hands-on construction and testing of product prototypes. An understanding and enthusiasm for polymer science, injection molding, engineered thermoplastics, adhesives and sealants (eg polyurethanes and epoxies), filtration/separation technologies, and water and wastewater treatment would also be highly desired.

To apply:

Please send CV and transcript to [Pierre Le-Clech](#) before 15th of October 2020.

