

## MASTER OF INDUSTRIAL RESEARCH

### Project Title:

Development of Innovative Ultrafiltration Membrane Technologies for Wastewater Treatment

### Industry Supervisors:

Geoffrey Johnston-Hall and James McMahon,

[Dupont Water Solutions](#)

### Academic Supervisors:

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

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[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 factors including

- (1) feedwater quality and the risk of fouling,
- (2) the membrane materials chemistry, and
- (3) the membrane design (i.e., dimensions, and configuration).

Within these design factors, DuPont Water Solutions (DWS) have identified the design and development of MBR membrane technologies with a superior balance of durability, flow, and fouling resistance, 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 develop a next generation



ultrafiltration membrane technology for use in DuPont Memcor's membrane bioreactor product. The key objectives of this project include:

1. Investigate the effect of membrane formulation additives on filtration performance
2. Investigate the impact of extrusion process conditions on filtration performance
3. Develop a durable next generation ultrafiltration membrane for membrane bioreactor applications
4. Develop and field test product prototypes



#### **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 industrial chemistry or chemical engineering, with knowledge of polymers and materials chemistry, and an interest in hands-on materials development and testing. An understanding and enthusiasm for membrane filtration/separation technologies, and water and wastewater treatment would also be highly desired.

#### **To apply:**

Please send CV and transcript to [Martina Stenzel](#) before 15<sup>th</sup> of October 2020.

