

Fabrication and Potential Applications of Antifouling Porous Membranes



Biography

Antoine Venault graduated from the University of Montpellier (France) in 2010 before moving to Taiwan at the end of 2010 to work as a postdoctor at the R&D Center for Membrane Technology at Chung Yuan Christian University (CYCU). He then became an assistant professor, associate professor and has been a full professor since 2019, all at the department of Chemical Engineering of CYCU.

Research focuses

- (1) *Membrane formation*: our long-term objective is to predict membrane structures and properties by understanding how formulation and process parameters influence mass transfers and the stability of the dope solution over time;
- (2) *Antifouling membrane designs and applications*: fouling is inevitable but we strive to mitigate it. For this, we incorporate antifouling materials into the dope solution during membrane production (*in situ* modification) or we apply these materials by grafting or coating after membrane formation (surface modification). These antifouling membranes hold great potential for biomedical applications;
- (3) *VIPS membrane designs and applications*: We dedicate some of our efforts to delve into the formation of fluorinated membranes using the vapor-induced phase separation process. Furthermore, we explore the wide range of applications these matrices offer, such as gravity-driven separation of oil and water, desalination, and bacterial removal from wastewater.
- (4) *Membranes for advanced applications and intelligent membranes*: we are dedicated to developing specialized membranes for unique functions. We are working on membranes capable of killing bacteria during the filtration process and subsequently being readily regenerated for reuse. We are also researching photocatalytic membranes that can degrade antibiotics and biological pollutants during the filtration process. Furthermore, we are investigating membranes with the ability to selectively capture cells from whole blood, which could be utilized in leukodepletion filters.

Education & Degrees

- **2010.09**: PhD, Chemical Engineering, Université Montpellier II, France
- **2007.09**: MSc, Chemical Engineering, Université Montpellier II, France
- **2006.09**: BSc, Chemistry, Université Montpellier II, France