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Thesis funded by the CNRS for the period of 01/09/2020 to 31/08/2023 and performed in the  
**GIMD and SYMAC DEPARTMENTS** and the **ESDSM**

## Dual innovative nano-catalytic membranes: CO<sub>2</sub> capture and intensified transformation into molecules of interest

### Context



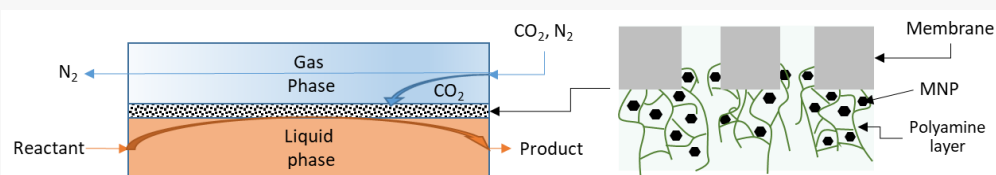
- Accumulation of green house gases in the atmosphere
- Development of **efficient chemical processes**
- **to transform greenhouse gases (GHGs) remains a challenge<sup>1</sup>**
- **CO<sub>2</sub> valorisation technologies** → Potential of reducing annual CO<sub>2</sub> emissions by 3.7 Gt<sup>1</sup>
- Strategy: **Innovative catalytic processes for the transformation of CO<sub>2</sub> into value-added products**
- **Catalytic membranes:** advantages such as - **catalyst immobilization** (facilitates reuse) and can **allow constant conversion over time<sup>2,3</sup>**



### Aims



- Develop an innovative catalytic system
- **Polymeric membranes with dual properties**
  - CO<sub>2</sub> capture (polyamine functionalized)
  - CO<sub>2</sub> → **Reactivity with organic substrates**
- Develop a **Hollow Fiber Catalytic Membrane Contactor** → **High production capacity for the transformation of CO<sub>2</sub> into heterocycles of pharmaceutical interest**

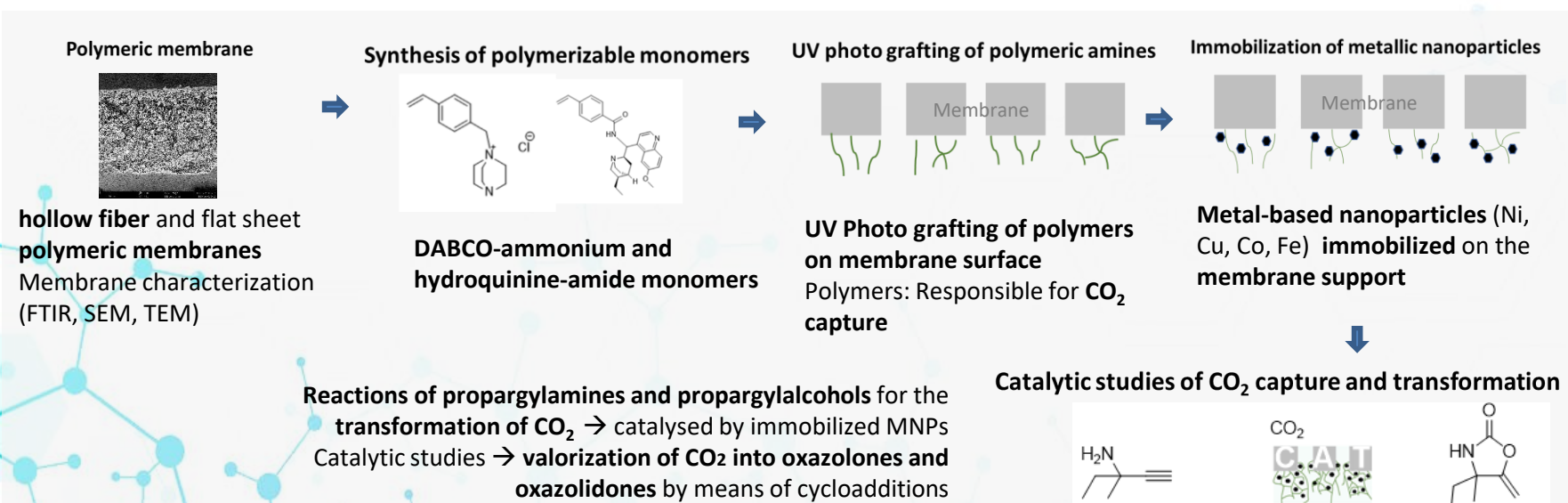


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### Materials and methods



### References

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- (2) Gu, Y.; Favier, I.; Pradel, C.; Gin, D. L.; Lahitte, J.-F.; Noble, R. D.; Gómez, M.; Remigy, J.-C. High Catalytic Efficiency of Palladium Nanoparticles Immobilized in a Polymer Membrane Containing Poly(Ionic Liquid) in Suzuki–Miyaura Cross-Coupling Reaction. *Journal of Membrane Science* 2015, 492, 331–339. <https://doi.org/10.1016/j.memsci.2015.05.051>.
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