



DN-MSCA-Horizon Europe  
Grant n°101119277

In the frame of the Doctoral Network MSCA Horizon Europe “ChimSep” dedicated to the integration of membrane separations (Organic solvent nanofiltration and membrane distillation) in fine chemistry, 13 PhD projects are funded for 36 months: 8 dealing with membrane science and 5 dealing with homogeneous catalysis.

See all the 13 projects at <https://theses.doctorat-bretagne.fr/dn-chimsep>

**Title- ChimSep-PhD#10: Process integration of organic solvent nanofiltration based on membrane cascades and distillation. Application to hydroformylation in toluene.**  
**Joint doctorate**

## Offer description

**PhD#10** will study the potential of process integration by making use of organic solvent nanofiltration (OSN), including the option of cascades, and combination with thermic separation processes (minimised classical distillation) applied to an hydroformylation media.

At KU Leuven (20 months), **PhD#10** will collect the OSN performances of a PDMS membrane that will be also further used for OSN transfer mechanisms elucidation with cross-feedback of all the **Membranologist PhDs** of the doctoral network also dealing with transfer and Chemist **PhDs#4** working on the same reaction.

At university of Rennes (ISCR-CIP, France, 12 months) he/she will theoretically study OSN cascades applied to the same reaction. This involves an exploration of cascade parameters and configurations, in which separation requirements for the reactions in toluene are linked to technical processing options. The cross-feedback between the 4 Membranologist PhDs of the doctoral network dealing with cascades will be useful for decision making.

Finally, fractionation processes will be proposed based on OSN cascades or on a hybrid process coupling OSN and distillation and theoretically studied in close relationship with our private partner **ProSim** at membrane separation or distillation modelling.

4 months will be spent at **ProSim (France)** to acquire knowledge on their process software use either for membrane & distillation modelling

The preparation of the PhD thesis and defence will be finalized at KU Leuven

## Keywords:

Membrane separation, organic solvent nanofiltration, homogeneous catalysis, distillation, process modelling, membrane cascade

**PhD starting date:** 01/11/2023

**Application deadline:** 31/08/2023 (23:59:00, Paris)

<https://theses.doctorat-bretagne.fr/dn-chimsep>

**Work location:** Leuven, Belgium (two year) & Rennes, France (one year)

The Doctoral Candidate will be enrolled in a joint doctorate between two partners of the network. He/she will spend 20 months with the hosting partner (KU Leuven, Belgium) of the present application and then a mobility of 12 months at University of Rennes, France.

During the doctoral period, the PhD will also spend 4 months at ProSim, France working with process software.

## Contacts

Thesis main supervisor (Belgium)

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Thesis second supervisor (France)

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**Required Education Level :** Master degree or equivalent

## Skills/Qualifications

The candidate will hold a Master degree or equivalent in chemical engineering or in chemistry with competencies in processes and/or membrane processes.

A previous experience in handling membrane processes will be appreciated

Knowledge of analytical characterization techniques, in particular UV spectrometry and gas chromatography, will be appreciated

Enthusiasm, autonomy, scientific curiosity and ability to communicate are required qualities.

**Required Language:** English, level: Good

## Required research experience

An internship of several months in a research laboratory involved in membrane separation will be appreciated

## Website for additional job details;

See application platform: <https://theses.doctorat-bretagneoire.fr/dn-chimsep>

section "Présentation de l'école doctorale » (doctoral network presentation)

## Salary

The selected PhD-candidate will be assigned full-time with a PhD scholarship with full social security.

The EU provides support for each recruited researcher in the form of

- Gross salary per month: close to 2 375 € (net should be around 1 890 €)
- + 600 € of mobility allowance. All eligible researchers recruited within a DN are entitled to receive this allowance. It contributes to the private mobility related expenses of the researcher.

- + 495 € of family allowance per month (if eligible to the conditions: be married or equivalent and/or have a child; family, long-term leave and special needs allowances. The family status of a researcher will be determined at the date of their (first) recruitment in the action and will not evolve during the action lifetime