

## 2 PhD positions in the EU Horizon 2020 Marie Skłodowska-Curie Project:



**Applications are invited for 2 PhD positions** (“Early Stage Researchers”) to be funded by the Marie-Sklodowska-Curie Innovative Training Network “INNOVEOX – Training of a new generation of researchers in Innovative Electrochemical Oxidation processes for the removal and analysis of micro-pollutants in water streams” within the Horizon 2020 Programme of the European Commission. INNOVEOX is a consortium of high-profile universities, research institutions and companies located in Belgium, Germany, the Netherlands, the United Kingdom, France and Greece (**Figure 1**).

### Key background info

#### Number of positions available

2 Phd Positions. (Candidates have been already preselected for the Recruitment Event for 13 out of a total of 15 Positions).

#### Research Fields

Water treatment/purification – Environmental Engineering - Analytical Chemistry – Chemical Engineering - Clean technologies, Circular Economy, Life Cycle Assessment

#### Keywords

wastewater treatment, priority pollutants degradation, electrochemistry, chromatography, mass spectrometry

#### Career Stage

Early Stage Researcher (ESR) or 0-4 yrs (Post Graduate)

#### Benefits and salary

The successful candidates will receive an attractive salary in accordance with the MSCA regulations for Early Stage Researchers. The exact (net) salary will be confirmed upon appointment and is dependent on local tax regulations and on the country correction factor (to allow for the difference in cost of living in different EU Member States). The salary includes a living allowance, a mobility allowance and a family allowance (if married). The guaranteed PhD funding is for 36 months (i.e. EC funding, additional funding is possible, depending on the local Supervisor, and in accordance with the regular PhD time in the country of origin). In addition to their individual scientific projects, all fellows will benefit from further continuing education, which includes internships and secondments, a variety of training modules as well as transferable skills courses and active participation in workshops and conferences.

**On-line Recruitment Procedure (see Appendix 1 for full description)**

All applications proceed through the on-line recruitment portal on the [innoveox.eu](http://innoveox.eu) website. Candidates apply electronically for one to maximum three positions and indicate their preference. Candidates provide all requested information including a detailed CV ([Europass format](#) obligatory). During the registration, applicants will need to prove that they are eligible, according to the ESR definition, mobility criteria, and English language proficiency. The deadline for the on-line registration is **12 November 2019**. The selected candidates provide a 20 minute presentation and are examined by the Recruitment Committee. In order to facilitate their travel, selected candidates (from outside Belgium) receive a fixed, lump sum of 250 euro (paid by the prioritised Supervisor). The final decision on who to recruit is communicated the day after the Recruitment Event. The selected ESRs are to start their research as quickly as possible (target: 1 January 2020).

**Applicants need to fully respect three eligibility criteria (to be demonstrated in the Europass cv):**

**Early-stage researchers** (ESR) are those who are, at the time of recruitment by the host, in the first four years (full-time equivalent) of their research careers. This is measured from the date when they obtained the degree which formally entitles them to embark on a doctorate, either in the country in which the degree was obtained or in the country in which the research training is provided, irrespective of whether or not a doctorate was envisaged.

**Conditions of international mobility of researchers:**

Researchers are required to undertake trans-national mobility (i.e. move from one country to another) when taking up the appointment. At the time of selection by the host organisation, researchers must not have resided or carried out their main activity (work, studies, etc.) in the country of their host organisation for more than 12 months in the 3 years immediately prior to their recruitment. Short stays, such as holidays, are not taken into account.

**English language:** Network fellows (ESRs) must demonstrate that their ability to understand and express themselves in both written and spoken English is sufficiently high for them to derive the full benefit from the network training.

## The 2 available PhD positions

### **ESR9: Evaluation of sample prep methods for the monitoring of eAOP degradation products**

**Host:** Ineris (France)

**Main supervisor:** Dr. François Lestremau  
(Francois.Lestremau@ineris.fr)

**Academic promoter:** Prof. Deirdre Cabooter (PhD awarded by KU Leuven)

**Duration:** 36 months

**Required profile:** (Analytical) Chemist, Pharmacist, Bio-Science Engineer

**Description:** AOPs tend to produce degradation products that are more polar than the parent pollutants. Current analytical methodologies are not completely suited to analyze a large range of pollutants particularly for polar to very polar substances. Direct injection of the sample can be performed but toxicological level of many of these pollutants (ng/L level) cannot generally be reached. Therefore, there is a current need to develop reliable analytical methodologies that are able to reflect the real composition of waste water pollution at trace levels particularly after degradation treatment. Pre-concentration of contaminants in waste water is particularly challenging due to the complexity of the matrix. As degradation products are expected to be mostly polar, only the dissolved phase will be studied. Enrichment methods based on solid phase extraction (SPE) will be evaluated and compared with large volume direct injections. Since compounds with a large variety in polarity will be considered, multi-mode SPE cartridges will be prepared in-house by combining different SPE sorbents. These sorbents will first be evaluated for a representative test sample to identify the most suitable combination of sorbents and retention/elution strategies. The developed protocol will then be applied to real samples generated in an industrial setting. Analysis will be performed using liquid chromatography coupled to high resolution mass spectrometry instrument. Data treatment will be particularly studied to produce a methodology suited for the determination and identification of a large range of contaminant with particular focus on generated polar degradation products.

### **ESR11: Development of high temperature vacuum GC-EI-MS and of capillary SFC-EI-MS**

**Host:** Ghent University (Belgium)

**Main supervisor:** Prof. Frédéric Lynen  
(frederic.lynen@ugent.be)

**Duration:** 36 months

**Required profile:** (Analytical) Chemist, Pharmacist, Bio-Science Engineer

**Description:** Today only GC-MS provides the potential of swift solute identification due to the exploitation of the extremely stable electron ionization (EI) process, allowing for the availability of compound libraries containing hundreds of thousands of compounds. As thus far soft ionization sources used in GC have not allowed the construction of comparable libraries. It is therefore highly useful to enhance the applicability range of hard high vacuum ionization sources in GC-MS to the analysis of less volatile solutes. Therefore, in this early stage research project the applicability range of GC will be extended through (I) the improvement of the thermal stability range of polar and apolar GC columns, and (II) the

implementation and further development of vacuum GC also in combination with the former approach. The potential of the recently developed vacuum UV detection will also be explored for the analysis of degradation products from eAOPs in combination with GC. Compounds not amenable to these GC based approaches will be studied in supercritical fluid chromatography in capillary type GC columns with CO<sub>2</sub> and Xenon as mobile phases whereby only density gradients are applied to ensure elution of all solutes on the columns. The avoidance of the usage of organic modifiers in this way will still allow for effective combination with EI-MS. The usage of xenon as mobile phase will additionally allow for identification of alarming functional groups in degradation products from eAOPs by direct hyphenation with infrared spectroscopy.

## ETN INNOVEOX project abstract and key project information

It has been demonstrated that organic chemical pollutants are still putting half of the European freshwater system at risk. The INNOVEOX R&D training network was built to address and provide a solution for this considerable challenge: to boost innovative electrochemical wastewater treatment techniques to effectively degrade highly hazardous organic micro-pollutants, reducing environmental pollution and improving the European quality of life and health. By setting up a training frame to educate the next generation of highly-qualified ESRs in one of the most promising fields in micro-pollutant degradation, this will enable to generate important innovations, necessary to create a new level of EU excellence and reinforce EU R&D capacity in the field.

The main INNOVEOX R&D objectives are:

1) the exploration of alternative electrochemical oxidation pathways via generation of different oxidative radicals, 2) the development of combined photocatalytic/electrochemical oxidation techniques, 3) the development of novel analytical approaches for the separation and identification of these micro-pollutants and their degradation products, and 4) an assessment of the effects of the developed treatments on the aquatic toxicity, biological wastewater treatment and the environment as a whole via a life cycle assessment.

These objectives combined will ensure a high-quality training with a high-societal impact for the reliable, economic and complete removal of priority pollutants from wastewater. Pushed by an interdisciplinary & intersectoral consortium of 10 leading beneficiaries and 7 partner organisations, the proposal will offer innovative training based on an optimal balance between research and formal training.

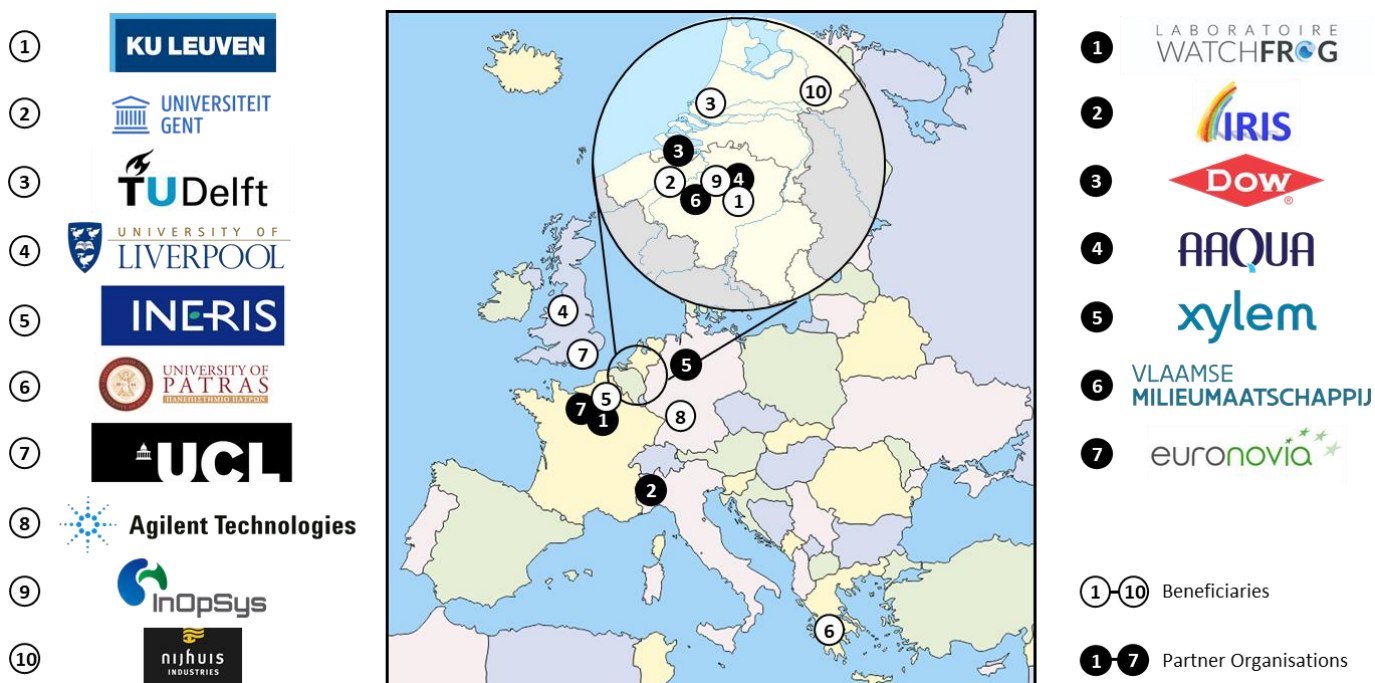


Figure 1: InnovEOX Consortium

## Appendix 1: Recruitment Procedure and Principles

A preliminary INNOVEOX recruitment web page is put on-line (10 August 2019). A special effort is made to promote the vacancies to refugees at the organizations and especially the participation of KU Leuven to the Online Linguistic Support for Refugees, an EU Initiative from which all the ESRs, if refugees, will be able to benefit. To attract the right students, the required profiles are clearly listed for each ESR position (e.g. ESR1: Chemical Engineer, Environmental Engineer, Bio-Science Engineer or Chemist).

Applications are made through an on-line, eligibility-proof form on the INNOVEOX recruitment webpage. The candidates apply for a maximum of three specific ESR positions and list their order of preference. The Supervisors provide the names of their preferred candidates to the SC, which in its turn produces a short list of candidates: 2 per position. As such a maximum of 30 ESRs (from an estimated initial pool of 120-200 candidates) are invited to the Recruitment Event, which coincides with the pre-kick-off meeting (Leuven, M2).

Each candidate gives a presentation and is interviewed by the SC. After a thorough evaluation, the candidates are ranked and a collective decision is made. In this way a complementary team of ESRs can be assembled, as positively experienced from previous ETN recruitment events.

In case not all 15 ESRs can be recruited during the collective Recruitment Event, the recruitment procedure is “decentralised”, meaning that the involved supervisors continue the search for good candidates. The GC is kept informed at all times when new eligible candidates appear. The GC makes an official complaint in case the Code of Conduct for the Recruitment of Researchers is breached. The involved supervisor is then expected to find another candidate. Recruitment problems are also, if still needed, discussed during the RC meeting (M6, M12) in order to deliver specific action plans to target specific networks relevant for the vacant ESR positions.

All details concerning the recruitment-procedure principles are communicated on the on-line application portal, so that potential ESRs know exactly what to expect and are stimulated to apply. All recruitment (pre and final selection) is in line with the European Charter for Researchers, providing the overarching framework for the roles, responsibilities of both researchers and employers. The Code of Conduct for the Recruitment of Researchers functions ensures that the selection procedures are transparent and fair.

The recruitment strategy of INNOVEOX fully complies with the Code of Conduct definition of merit. For example, merit is not just measured by a researcher's grades, but on a range of evaluation criteria, such as teamwork, interdisciplinary knowledge, soft skills and awareness of the policy impact of science.

The SC has members of each gender and considers the promotion of equal opportunities and gender balance as part of the recruitment strategy. Also, in view of the RRI principles, special efforts are made to attract women and ESRs from new EU Member States.

INNOVEOX aims at a participation of 50% female ESRs in the network. Researchers are employed on fixed-term contracts and are

registered as staff candidates for PhD degrees. Therefore, they are entitled to pension contributions, paid holidays, and other benefits as governed by the universities and industrial companies.

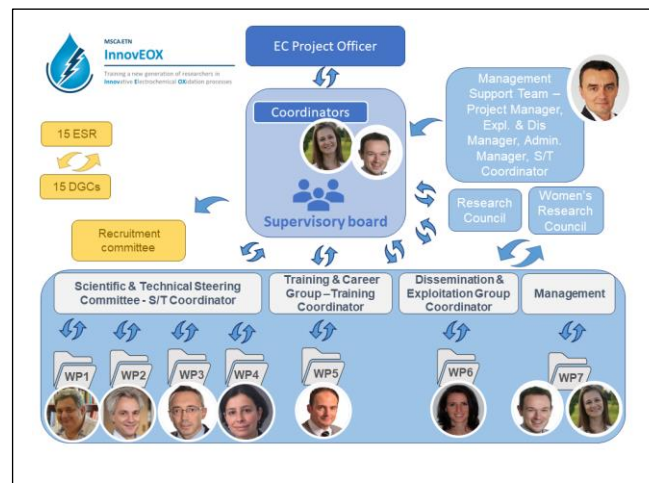


Figure 2: INNOVEOX Governance including SC

**SC** = Selection Committee = This committee involves the General Coordinator (f), the Training and Career officer (m), one representative per Beneficiary, Dr. Hamed Eghbali of Dow as co-chair, and two elected non-academic partners. Its goal is to oversee the recruitment of the ESRs during the collective recruitment event.