

# 1 PhD position in the EU Horizon 2020 Marie Skłodowska-Curie Project:



**Applications are invited for 1 PhD position** (“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

1 Phd Position.

### 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 **18 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. 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 available PhD position

### **ESR13: Toxicity assessment of degradation products using zebrafish and advanced LC-MS techniques**

**Host:** KU Leuven (Belgium)

**Main supervisor:** Prof. Deirdre Cabooter  
(deirdre.cabooter@kuleuven.be)

**Duration:** 36 months

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

**Description:** To investigate the toxicity of the degradation products formed during different eAOP treatments, zebrafish larvae with an age of 3 days postfertilization will be exposed to samples collected before, during and after eAOP treatment via immersion. Zebrafish is a novel and promising small-animal model for toxicity studies. The strength of this *in vivo* model lies in its high genetic, physiologic and pharmacologic homology to humans. Their high fecundity, optical clarity and small size moreover allow performing tests in a medium to high-throughput fashion using microgram-scale quantities of compound. In this way, a unique system is obtained that combines the throughput of *in vitro* techniques (required to screen the large number of samples that will be generated in this project) with the bio-relevance of the whole animal. Zebrafish will first be exposed to the entire sample obtained before, during or after eAOP treatment. When toxicity is observed, the compounds responsible for the toxic effects will be separated and identified using advanced LC-MS techniques. Due to the expected complexity of the samples, the potential of multi-dimensional LC in combination with quadrupole time-of-flight MS will be evaluated for this purpose. Hands-on experience with LC-HRMS is hence a plus. Once potentially toxic compounds are identified, these compounds will be purified using (preparative) chromatography and zebrafish will be exposed to these compounds separately to confirm their toxicity. 10 larvae per sample will be live-screened at 24 and 48h post-treatment for lethality or symptoms of toxicity, including, lethality (as determined by cardiac arrest), edema, impaired circulation, change in heart rate, hemorrhaging, tissue necrosis, loss of posture, impaired motility (diminished or absent touch response), body curvature, swim bladder and jaw defects. This assessment will be carried out through visual observation of treated larvae using a standard light stereomicroscope. When toxicity is observed, a more specific, organ-related assessment of the toxicity will be made using different transgenic zebrafish lines. In this way, compounds will be screened for hepato-, cardio-, and neurotoxicity via high-throughput behavioral and seizure assays, cell imaging and 2D image based morphometric analysis.

## 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.

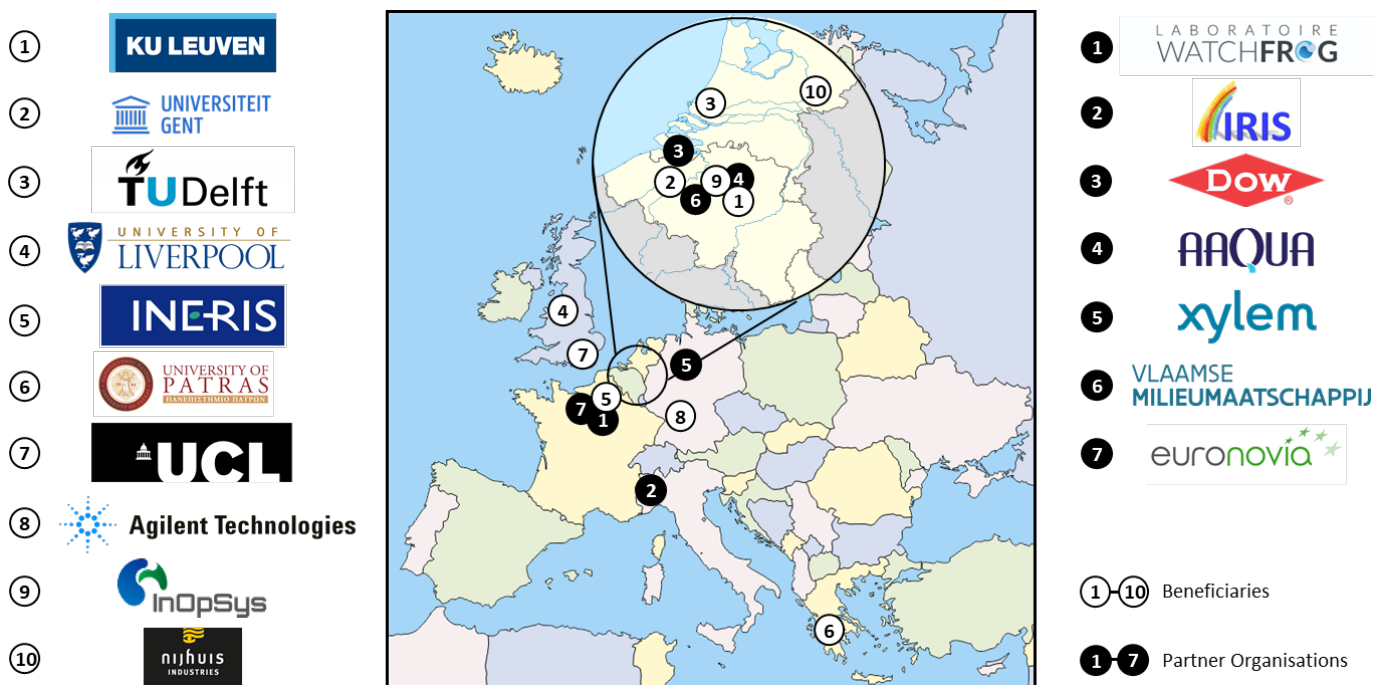


Figure 1: InnovEOX Consortium

## 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.

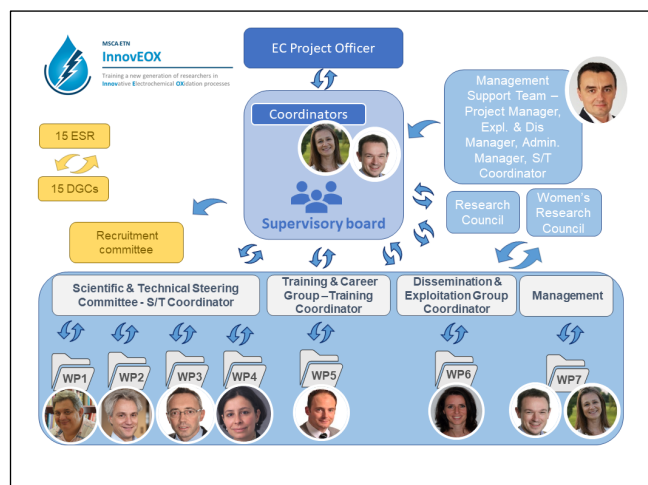


Figure 2: INNOVEOX Governance including SC

**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.